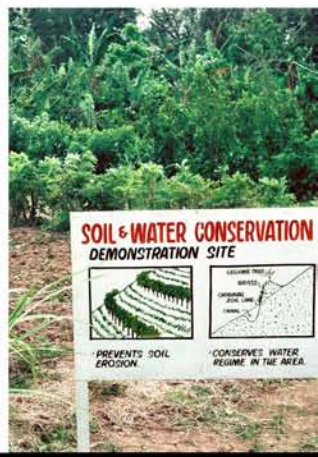
Strategies and financial mechanisms for sustainable use and conservation of forests:

experiences from Latin America and Asia



Proceedings of an Inter-Regional Workshop
Chiang Mai, Thailand, 20-22 November 2006

Edited by Simmathiri Appanah, Eduardo Mansur and Rolf Krezdorn

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Sloping Agricultural Land Technology (SALT) demonstration site of the International Institute for Rural Reconstruction, Philippines, demonstrating techniques for control of soil and water erosion (Photo: Patrick Durst)
Agroforestry – pepper intercropped with Gliricidia sepium at the Baptist Rural Life Center, Mindanao, Philippines (Photo: Patrick Durst)
Bamboo – an important non-wood forest product (Photo: Masakazu Kashio)
Waterfall outside Luang Prabang, Laos (Photo: Masakazu Kashio)

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STRATEGIES AND FINANCIAL MECHANISMS FOR SUSTAINABLE USE AND CONSERVATION OF FORESTS: EXPERIENCES FROM LATIN AMERICA AND ASIA

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
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Foreword

When I come across large areas of tropical forests slashed down to make way for agriculture and other development, I am of two minds. On the one hand I mourn the loss of some of the world's great terrestrial ecosystems that are critical for life to thrive on earth. On the other hand, we do have to sacrifice parts of these forests so food, fiber and energy crops can be raised, so vital for meeting the basic needs of millions of people on earth. But beyond that consideration, my concern also is heightened by how the remaining forests are managed. By all accounts, sustainable management of tropical forests remains a Sisyphean task, and it is no surprise when we hear that hardly five percent of these forests globally are being managed so. Now, with greater understanding of the critical role that tropical forests play in climate change and their potential for its mitigation, the issue of sustainable forest management is becoming even more pressing.

After decades of work, with FAO as a major contributor, technical solutions to managing the forest ecosystems are within our grasp. However, in the vast majority of countries in the region, they are not employed to the fullest extent. There are many reasons behind this reluctance. For one, the benefits – such as from conservation of soil and hydrological processes, biodiversity, carbon sequestration, and a host of others, as a result of practicing sustainable forest management – do not generate revenue for the forest owners. Next is the higher costs and complexity that go with sustainable forest management, compared to a narrow focus on production of timber and a few other readily marketable products. The third factor is a rather daunting one – conversion to other land uses including agriculture generates far more income than all the intangible benefits that accrue from sustainable forest management practices.

Where shall we go from here? The solution of course lies with paying for the intangible forest products that bring benefits not only to the forest owners. Researchers have been pursuing a number of approaches that include payments for environmental services, trading only with products that are sourced from sustainably managed forests, marketing of non-wood forest products, bio-prospecting fees, ecotourism, etc. At present trading in carbon offsets is the attention grabber globally. Many new approaches are being explored, but these cannot be easily adopted without concomitant changes in legal and institutional structures.

Most of the financing arrangements are novel and still under exploration. No single country has implemented the array of financial mechanisms for enabling sustainable forest management. Within the context of financing is also the need to protect and improve livelihoods of forest dependent people. This proceedings represents the results of a workshop of forestry experts who were able to report on the various financing mechanisms that are being tested on the ground. The proceedings goes beyond the financing issues, and also looks into the challenges of technology transfer, capacity building, and policies and legislation issues which are required for such novel innovations to take root.

A further fine point about the proceedings is that it represents, perhaps for the first time, sharing of information and experiences between Latin American countries and those from the Asia-Pacific region. It is interesting to note that in the former, many more innovative approaches are being tested. The circumstances that have resulted in those countries being more experimental and innovative are worth investigating, and which of them can be applied in the Asia-Pacific countries is equally exciting. I wish to congratulate all for their

contributions to this volume. But I further wish to stress that while this volume is an important turning point in the overall development of financing issues, the pressure to manage forests on a sustainable basis is growing rapidly. Further developments are needed in this arena before their impact can be realized.

He Changchui
Assistant Director-General and
Regional Representative for Asia and the Pacific

Contents

Acknowledgments

This volume is the result of a workshop sponsored by FAO and GTZ. The participants in that meeting were uniquely inspiring, making it rather obligatory that all the ideas are captured and reported in various forms in this volume. The editors wish to express their thanks to the many others who contributed to the book's content and production. They include: Ms. Chanida Chavanich and Ms. Janice Naewboonnien for design and layout of the volume; Ms. Apinya Petcharat for the cover design; Messrs. C.T.S. Nair, C. Brown and P.B. Durst for supporting the workshop, from formulation of the concept to actual conduct; and Ms. K. Meechantra for the prodigious effort with arranging all the logistics for a smooth conduct of the workshop.

1 Financing Sustainable Forest Management: A Growing Challenge

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Abstract

With increasing globalization of markets, rising environmental awareness, and attention from international conventions and agreements, the vast majority of countries are looking into managing their forests more sustainably. The main limitation appears to be lack of funding for improving forest management. Traditional sources include the government, targeted investments from the private sector, international donor support, and contributions in kind from rural communities. But these are grossly inadequate, and additional finances are required. Alternative financing arrangements are being developed and tested in many countries. They include a vast array of schemes such as conservation concessions, debt-for nature-swaps, payments for environmental services, including "green funds" (payments for carbon offsets), and compensatory payments, to cite a few. However, the roles, priorities, and requirements of the various funding entities remain unclear to the vast majority of individuals involved in forest management activities. This introduction touches on the array of schemes being tested. The rest of the papers in this proceeding highlight specific schemes which are gathering interest for financing sustainable forest management.

Introduction

Concern for loss of tropical forests has been on the global agenda for several decades now. This is reflected by the increasing number of international conventions and initiatives dealing with forests, environment and sustainable development (IISD 2001). Things have intensified of late, following better understanding of the detrimental impact of forest destruction on climate change. This debate on the link to climate change has triggered more countries into taking action – many are expressing interest in improving forest management. This interest, while representing a step forward, is not matched with sufficient action. This is not due to a lack of technical approaches – actually an abundance of approaches are available. The main complaint (and constraint too) seems to be the lack of funding for implementing sustainable practices.

Ideally, sustainable forest management should be self-financing through the sale of forest goods and services (Panayatou & Ashton 1992). As things are, it is not the case with the majority of the tropical forests. This is not to say the profits from timber logging are not enough. Countries do not feel compelled to invest more into their management. Further, if profits from timber harvesting decline from present levels, the desire to convert the forests to other land uses, particularly agriculture, may increase. These considerations have to be further balanced with the degradation of the environment and livelihoods of forest-dependent people as well. Considering there is much difficulty in financing sustainable management of timber producing areas, the situation for forest areas without any tangible products may be even more problematic.

The subject of how to and who should finance sustainable forest management continues to dominate the national and international dialogue on forests (PROFOR 1998). With government budgets for forest administration falling in many countries and prices for many products in decline, current financial resources for forest management are considered insufficient in many areas. Under the circumstances, alternative and innovative financing systems are being explored by national and international agencies, NGOs, and the private sector. The ideal situation would be one where some income is received for simply keeping the forests as forests (McCauley 2006). Another would be an arrangement where the forest owners are compensated for the environmental and other forms of services emanating from forests. A third scenario would be the case where the additional costs incurred from implementing sustainable forest management are met from an external source or a facility dedicated to support such activities.

So far the experiences have been quite variable from country to country, and tend to be concentrated on a few mechanisms. The variety of funding mechanisms, including payment for environmental services, has not been explored fully in all countries.

Particularly, forest areas not used for production are rarely self-financing, and subsidies and/or direct action by the government are required to manage these areas properly. Consequently, financial resources are often insufficient to properly manage vast areas of forests. In light of the substantial financial resources required, effective mobilization of funds needs to involve a wide range of mechanisms and sources, both traditional and innovative, public and private, and domestic as well as foreign.

Traditional funding mechanisms are generally well recognized, and many countries are making regular use of them (Ames 1998). Governments allocate budgets to forest administrations. Donors (including bilateral aid agencies, multilateral organizations and development banks) provide funds for projects and programmes. The private sector provides financing for targeted investments. Non-governmental organizations – sometimes playing roles very similar to donors and implementing agencies – provide support, especially at the grass-roots level. Millions of rural people donate time and effort to plant and tend trees, and to manage existing forest resources for goods and services.

In addition, an array of alternative financing arrangements is being developed and tested (Landell-Mills & Porras 2002). But it remains a significant challenge for the forest sector to identify and secure adequate funding for all forest management responsibilities. The roles, priorities and requirements of the various funding entities remain unclear to many individuals. Governments, donor organizations, financial institutions and others need to increase their awareness and understanding of the traditional and innovative options for increasing the

level of financing devoted to sustainable forest management, so that efforts to ensure adequate funding will be well-guided and their expectations remain realistic.

Sources of funding

International community

All countries have come under increasing pressure in recent years to enhance forest protection and improve management. Developing countries have often contended that such insistence must be accompanied by tangible financial support for forest conservation, management and capacity building in the form of higher levels of official development aid, increased market access, and innovative new financing schemes such as conservation concessions and debt-for-nature-swaps[1].

An important question, however, relates to the extent that developing countries can or should rely on grants and loans provided by international partners for financing sustainable forest management. Donor priorities have shifted to support rural livelihoods and poverty reduction and there is progressively less forest specific support. On the other hand, many forest-related projects have been criticized for being donor-driven or for infringing on national sovereignties. Hence, there is apparent wariness on the recipient side as well.

International financing is indispensable for activities that protect the global environment and provide benefits beyond local boundaries and national borders. It is therefore likely that financing mechanisms such as the Global Environment Facility (GEF) will play an increasingly important role in the near future. Furthermore, support from international and bilateral partners serves an important catalytic role in supporting change and the adoption of new practices and processes, such as national forest programmes. But in some ways, donor support may reduce opportunities for the private sector to become more actively involved. For example, donor support for the establishment of forest plantations or forest product processing could well undermine the motivation of the private sector to invest in such ventures (Enters & Durst 2004).

Public sector

The local and domestic benefits that environmental protection and sustainable forest management provide accrue to society at large. This explains why historically the protection and management of critical forest areas, such as watersheds and biodiversity reserves, has been the responsibility of government. In serving the public interest, governments will be fully justified in continuing efforts to safeguard the environmental services that forests can provide. However, particularly as public sector budgets shrink, governments should increasingly focus on facilitating private sector investments and promoting market-based approaches that support the provision of environmental services.

An increasing number of examples demonstrate that the private sector can take on responsibilities that historically have been shouldered by public-sector forest administrations and financed through government budgetary allocations (Chipeta & Joshi 2001). Further

[1] *Since the meeting was held, there has been a tremendous explosion of interest in international funding for climate change initiatives such as "Reduced Emissions from Deforestation and Forest Degradation."*

experience is needed, however, to determine those functions that can be most effectively assumed by the private sector and those which require continued involvement of forest agencies. Research, extension and capacity building are areas that may continue to rely extensively on government support. Private sector investment in these areas remains limited, although it has been increasing, for example in the area of biotechnology.

To some extent, public funding allocations are also determined by how government agencies view themselves and to what extent they are willing and able to "reinvent" themselves to demonstrate relevance in times of change, such as shifts in forest management objectives and the decentralization of management authorities. There is an increasing trend in many parts of the world for governments to reorient themselves from the provider of public benefits to buyer of these benefits. In making this transition, policy makers and forest administrations may do well to assess who can perform desired functions most effectively and efficiently, and subsequently work to enhance their contributions through appropriate financing.

Private sector

Experience has demonstrated that the private sector will make investments in the forest sector if the expected rates of return are sufficiently attractive and a favorable business climate exists (Chipeta & Joshi 2001). For example, there was great interest in financing forest plantation expansion when wood product prices were rising sharply in the early 1990s. Forest product processing is another domain largely financed by the private sector. To encourage the private sector to invest with full confidence and commitment in sustainable forest management requires the creation of a stable enabling environment.

The private sector has historically been quick to invest in the production and processing of forest goods, timber and non-wood forest products when the prospects for profits were apparent and the opportunity has been granted. This pattern continues throughout the region and, as the Sustainable Forest Management License Agreement approach in Sabah, Malaysia, indicates, innovative ways are being developed to encourage long-term investments in forest management by profit-seeking enterprises.

For the most part, the private sector has paid relatively little attention to the environmental services that forests, if properly managed, can provide. However, a number of innovative market-based solutions have recently emerged, some of which suggest that the private sector can play a dual role (Richards 1999). On the one hand, private companies can benefit from "green" funds (e.g. through carbon offset arrangements). Several carbon sequestration payment schemes are being explored internationally, especially within the framework of the Clean Development Mechanism. Although the process is very complex, countries are slowly beginning to see opportunities growing here, with afforestation funds from carbon emitters.

The private sector can also make compensatory payments to forest users and land owners who forgo direct benefits in the process of providing recognized and valued environmental services. Ecotourism, amenity values and watershed protection may serve as examples. For instance, healthy watersheds can provide improved water quality, local flood protection, soil erosion control and soil fertility maintenance – all of which can be of enough interest to the business community that it may be willing to pay for the maintenance or enhancement of the services.

Forest certification is another approach which seeks to supplement financing for adopting good forest management by adding value to products produced in a sustainable manner. Despite the growing acceptance of forest certification systems, only minor price premiums are obtained in markets for certified products to date. Greater incentives for forest certification are needed such as enhanced recognition and increased market access for certified forest products. One issue that undermines such efforts is illegal logging, which greatly reduces the profitability of legitimate companies and operators by supplying cheap timber to markets.

Conclusions

Economic significance of the wide range of contributions that forests make to the environment, rural development, poverty reduction and other economic sectors has been receiving greater attention in recent years. Although competitive tenders and payments linked to carbon sequestration and supplies of clean water may represent potential sources of significant funding for sustainable forest management, the development of market-based payment for environmental services (PES) mechanisms is still in its nascent stage. Actual examples of innovative financial arrangements are concentrated on a few cases mostly involving the government use of tax to reward land owners for environmentally positive actions (e.g., compensation to land owners/users for watershed protection in South Korea and Japan; payment to farmers for converting marginal farmlands to forests in China; tenders for improving native vegetation in Australia; subsidy for plantation establishment in New Zealand and Australia; and payment to local people for forest protection in Viet Nam). Constraints to the development of effective PES schemes include high transaction costs, the difficulty in defining their values and property rights, and uncertainties over required biophysical information.

While ecosystem market's potential to become an important source of financing remains limited at this point, forging of public-private partnerships to innovate financing mechanisms for sustainable forest management is promising. Private sector involvement in forestry is critically important for developing, managing and conserving forest resources, as well as for processing and marketing of forest products.

Equally important as exploring alternative financing options is focusing on how much can be achieved with the funds currently available and improving cost-effectiveness through the establishment of strategic partnerships among stakeholders. An increasing number of countries and organizations have found that greater emphasis on effective partnerships and more careful use of existing budget resources can yield significant results without the need for additional budget allocations. Cost savings can be made, especially in the area of national legal frameworks, where the complex regulations lead to high cost of enforcement for the authorities and high cost of compliance for the commercial operators, small farmers and communities.

In order to capture additional finances for sustainable forest management, increasing the level of understanding and awareness of the traditional and innovative financing options is essential. Policy, regulatory and administrative impediments that limit efforts to diversify financing sources need to be identified, and the legal and institutional reforms brought about to remove those impediments.

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2 Payment for environmental services: what can we learn from Costa Rica?

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Abstract

Up to the 1980s, Costa Rica experienced one of the highest rates of deforestation in Latin America. This was driven principally by inappropriate policies. Today, the country is seen as a front-runner in environmental legislation and policies. Among the instruments developed to stem deforestation is the economic one known as Payment for Environmental Services (PES). The Costa Rican PES Programme is one where landowners receive direct payments for ecological services which their lands produce by those who benefit from such services. Principal sources of funding for the PES Programme come from tax on fuel sales, payments for water by hydroelectric companies and other water blotters, and Certified Tradable Offsets or carbon bonds. Fundamental to the implementation of the program has been the forest policy institutional framework. It includes establishment of the Fund for handling the financial issues for forests and natural resources, legislation to protect the environment and biodiversity, establishment of a fuel tax, and technical support for reforestation and forest management. The success of the Programme may, however, not be cost-optimal in all circumstances. Countries intending to apply such a programme have to make sure the legal, institutional, financial and political frameworks are in place, and that they include transparency and accountability.

Introduction

In the Latin American context, Costa Rica is a front-runner in environmental legislation and policies, as well as the development of institutions responsible for natural resource management and financial mechanisms to promote conservation and restoration of forest ecosystems. As a result, important progress has been made in the past three decades in strengthening reforestation and activities based on forest use and management, and in designing economic instruments for conservation and sustainable management, one among them being the Payment for Environmental Services (PES) system.

It is generally accepted that the best way to promote forest ecosystem conservation and combat land degradation is through development, introduction and promotion of sustainable production systems. Such an approach is usually accompanied by indirect incentives such as the acquisition of infrastructure, equipment, product marketing, temporary payments for labor, and food for work programmes. The assumption is that new technologies will be

adopted, that a market for the derived products will develop, and that they will generate higher incomes for land owners, creating an incentive to maintain the forest ecosystems.

An alternative approach to encourage the conservation and restoration of forest ecosystems is to pay for conservation performance directly to private land owners (Ferraro & Simpson 2002). In this approach, those that benefit from the provision of environmental services derived from land use and production systems that improve the environment and quality of life, make payments to those land owners that supply the services (i.e. to those that adopt the desired land uses and production systems). In the case of land uses such as forest management, commercial reforestation, as well as forest conservation, the payments for environmental services are additional to income from forest products sales; therefore, they help to improve the irregular cash flow frequently seen in forest production systems.

The Costa Rican Payments for Environmental Services Programme (PESP) is an application of this approach. In this system, landowners receive direct payments for the ecological services which their lands produce when they adopt land uses and forest management techniques that do not have negative impacts on the environment and which maintain people's quality of life.

Costa Rica's Forest Law recognizes four environmental services provided by forest ecosystems: (i) mitigation of GHG emissions; (ii) hydrological services, including provision of water for human consumption, irrigation, and energy production; (iii) biodiversity conservation; and (iv) provision of scenic beauty for recreation and ecotourism.

Costa Rica recognizes that the aggregate value of the environmental services offered by its forests constitutes an enormous financial potential beyond the mere commercial value of the wood in the country's natural forests and forest plantations. The country has introduced innovative mechanisms by which smallholder owners of natural forests and forest plantations receive direct payments for the environmental services that these forests provide to Costa Rican society and to the world at large (Espinoza *et al.* 1999; FONAFIFO 2005).

Even though Costa Rica has a long history of conserving natural resources through the national park system and of developing incentive mechanisms for the rehabilitation of wooded lands (Arias & Castro 1997), it took years of policy debate and societal consensus building to elaborate the approach of paying for environmental services.

The forest context

Status of the resource

Costa Rica covers an area of 51,100 km^2, of which 25% (1,284,543 ha) is made up of Protected Woodland Areas (ASP).[2] There are varying levels of protection for the forests in these areas, according to the area designation. The country's main primary forests are found within the National Parks and Biological Reserves, which are the categories for absolute protection. They represent 11% (590,991 ha) of the national territory in which no exploitation or productive activity whatsoever is permitted (MINAE 1999). Another important

[2] *These territories include 132 national parks, biological reserves, wildlife refuges and other ASP categories.*

percentage of primary forest is found in the indigenous territories, occupying approximately 180,000 ha in the southern and Caribbean areas of the country (Indigenous Table 2000).

With respect to total forest cover, some data indicate that Costa Rica has succeeded in reversing the deforestation rate considerably. Between the 1950s and the 1970s, the country had an intensive agricultural development policy that increased deforestation and accelerated the loss of forest cover (Camacho *et al.* 2001). The result was that by the 1980s the country registered one of the highest deforestation indices in the world (Camacho *et al.* 2000); in 1985, it had only 24% forest cover, and a deforestation rate of 32,000 hectares per year (MINAE 2002). By 1997, however, the forest cover had increased to an estimated 40.4% of the national territory[3], and estimates based on information from 2002 were that by that time it had reached 45.4%[4] (FONAFIFO *et al.* 2002).

Forest-related economic activities

Exploitation of the forest and value-added lumber activities contribute approximately US$141 million to the national economy, which amounts to 0.87% of the Gross Domestic Product.[5] Close to 8,000 businesses in the country are linked to forest management and generate roughly 18,000 jobs (Barrantes 2002).

Costa Rica's forestry sector made a major effort to certify its environmental performance. As a result, 65,344 hectares of forest and forest plantations now use environmental certification schemes of management (Estado de la Nación 2000).

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[3] This study, prepared by the Tropical Scientific Center and University of Costa Rica with financing from the National Forestry Financing Fund (FONAFIFO), refers to forest cover, which implies a broader concept than non-intervened primary forest; it includes intervened forest, secondary forest and forest plantations. Some environmentalist groups have criticized it, as they feel that it does not reflect the true situation of Costa Rica's primary forests. They have noted the existence of much lower figures in studies prepared by other international agencies such as the WWF.

[4] This 2002 study, also conducted by the Tropical Scientific Center, this time in coordination with the University of Alberta and FONAFIFO, mentions that the difference in forest cover percentages between 1997 and 2002 is essentially due to differences in cloud cover in the satellite images used in the 1997 study, as well as improvements in detecting dry tropical forest. Despite these encouraging figures, however, there is still strong pressure on the primary forests. Various studies mention uncontrolled use in areas where there is greater presence of primary forest: namely, the north and Caribbean regions (Talamanca) and the Osa Peninsula in the southern area (FONAFIFO et al. 2002, Fundación CECROPIA (1999). One of the main forest management problems is illegal felling; recent data indicate that 35% of the timber extracted is done illegally (MINAE 2002).

[5] These figures were provided by Alfonso Barrantes, Director of the National Forestry Office, and are part of a soon-to-be published study conducted by ONF (2002). The data include the contribution of value-added activities related to lumber (felling, transport, industrialization, construction and furniture). Research on the biodiversity of Costa Rica's forests is also becoming an economic activity promoted by the National Biodiversity Institute (INBio), the entity responsible for promoting sustainable biodiversity use at a national level. Since 1991, INBio has signed biodiversity research contracts with various transnational corporations and foreign universities valued at over US$2 million.[8]

Eco-tourism is another important forest-related economic activity. The international promotion of Costa Rica as a "green" tourist spot has made the forest a valuable tourist attraction. During the 2005 tourist season, 72% of those who visited the country went to some protected area (national parks, wildlife refuges and others). It is no accident that 40% of the 120 private reserves associated with the National Private Reserves Network are dedicated to tourist activity (Red de Reservas 1999).

Institutionality of forest management

The State Forestry Authority

The State Forestry Authority (AFE) is responsible for directing forest management in Costa Rica. It is made up of three entities: the National Conservation Areas (SINAC) and National Forestry Financing Fund (FONAFIFO), both of which answer to MINAE, and the National Forestry office (ONF), which is a participatory body for designing policies, and is made up of various stakeholders from the private forestry sector and ecological organizations.

The Authority's main functions are exercised through SINAC and are laid out in the Forestry Law,[6] which in Article 1 establishes as an essential and priority function of the state: "*To care for the conservation, protection and administration of the natural forests and the production, exploitation, industrialization and promotion of the country's forest resources destined for this purpose, according to the principle of appropriate and sustainable use of renewable natural resources. In addition, it will see to the generation of employment and an increased living standard for the rural population through their effective incorporation into forestry activities."*

SINAC, the most important forestry administrative body with national coverage, is responsible for administering the State Forestry Patrimony policy[7] and in fact administers all forests in the country, independent of whether they are found within some category of protected wooded area, are in private hands, or belong to the municipalities. It should be clarified that the Forestry Law considers as forest any parcel of land of two hectares or greater with at least 60 trees per hectare.[8] The scope and limitations of SINAC's

[6] *The legal framework that established SINAC's competencies regarding forest management and administration is comprehensive: the Forestry Law (1996), the Biodiversity Law (1998), the Organic Environmental Law (1995), the General Wildlife Law (1993) and the National Parks Law (1977).*

[7] *This patrimony is made up of forests and the forested lands of the national reserves, areas declared inalienable, farms recorded in their name and those belonging to the municipal governments, autonomous institutions and other public administration agencies (Forestry Law Art. 13).*

[8] *The Forestry Law defines a forest as an autochthonous native ecosystem, intervened or not, regenerated by natural succession or other forestry techniques, occupying a surface of two or more hectares, characterized by the presence of mature trees of different ages, species and sizes, with one or more canopies covering over 70% of this surface and having more than 60 trees/ha of 15 cm or more in diameter (Art .3). This definition of a forest is so broad that a forested plantation could be considered a forest if it fits within the suppositions of the cited article, which is totally feasible. Nonetheless, for purposes of forestry exploitation, plantations only require a Management Plan to be eligible for the Payment for Environmental Services programme. If the plantation is not within the PSA system, it only needs a "certificate of origin," which is a document prepared by a forestry regent verifying that the lumber exploited comes from a forested plantation. Any kind of forestry exploitation requires a Forestry Management Plan that establishes the technical conditions to guarantee its sustainability. This plan must be prepared by a forestry regent contracted by the party interested in*

administration vary, depending on whether the forest is found within some ASP or is in private hands, as well as the kind of use being contemplated.

SINAC's deconcentrated structure

SINAC, created in 1995 through an executive decree,[9] meant an important change in management of the country's natural resources, since the Wildlife Department, Forestry Department and Parks Service were unified into a Superior Division of the National System of Conservation Areas. The country was divided into 11 conservation areas, and regional departments and sub-regional offices were set up in each one of them (Figure 1). The management competencies and approval of certain procedures were also transferred, as were regional-level permits and forest control. This regionalized organization is unique within MINAE.[10]

Figure 1. The national system of conservation areas (SINAC)

Source: MINAE, 2006

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the exploitation. The management plans drafted by the regent must be endorsed by SINAC and must respect official requisites and guides. Forest exploitation in lands not considered forest also requires SINAC's authorization. Terrain with forest cover of under two hectares requires the presentation of a study called a "forest inventory," which is less technical than the management plan but must contain minimal sustainability criteria for exploitation and must also be prepared by a regent. When terrain for agricultural use without forest is at issue, a "Permit to cut trees in pasture," issued by the Regional Councils of Conservation Areas, is required. The Forestry Law establishes that municipal governments should grant this permit, but the competency was later transferred to the Councils, though in practice they are currently granted by SINAC because the Councils have not yet been created.

[9] *Decree No. 24652-MIRENEM of September 20, 1995.*

[10] *This reform, which in principle might seem simple, has taken several years, and many SINAC officials feel it is not yet in its final and best form. The reality is that an attempt was made to bring together in a relatively short period three departments that traditionally worked independently and with different orientations.*

In an attempt to promote local participation in managing MINAE/SINAC, certain participation arenas were formalized legally. In 1995, under the Organic Law of the Environment, Regional Environmental Councils were created as maximum deconcentration entities under MINAE with the capacity to make policy recommendations and process denunciations, although without specific competencies on forestry issues. In 1998, the Biodiversity Law created Regional Councils of Conservation Areas, with functions more related to forestry management, such as the mandate:

- To recommend to the National Council of Conservation Areas the creation, modification or change of category of protected wooded areas;
- To participate in fighting pests and forest fires;
- To recommend areas to receive incentives;
- To authorize the cutting of trees in pastureland;[11]
- To issue certificates of origin for the timber extracted from forest plantations.[12]

The National Forestry Financing Fund (FONAFIFO)

FONAFIFO's history dates back to the year 1990, with the promulgation of Forest Law No. 7174 and its Regulations, together with Executive Decree No. 19886-MIRENEM. Subsequently, the National Forestry Financing Fund was created in 1991 through Rule No. 32 of Law No. 7216 of the Ordinary and Extraordinary National Budget, and later FONAFIFO was established through Article 46 of Forest Law No. 7575 (FONAFIFO 2006).

FONAFIFO's general objectives are to finance small and medium-sized producers through loans or other mechanisms, to promote the management of forests, both intervened and natural forests in order to encourage forest plantation and reforestation processes, the establishment of forest nurseries and agroforestry systems, the rehabilitation of deforested areas, and also to promote benefits from technological advances in the use and industrialization of forest resources. FONAFIFO also mobilizes funds to pay for environmental services provided by forests, forest plantations and other activities to strengthen the development of the natural resources sector.

FONAFIFO is a fully decentralized body within the organizational structure of the State Forest Administration. The aforementioned Law 7575 grants it relative autonomy, instrumental legal status and the authority to engage in any type of licit non-speculative legal transaction, including the establishment of Trust Funds, to guarantee the effective administration of its patrimonial resources.

FONAFIFO is administered by a Governing Board, composed of five members (two representatives from the private sector and three from the public sector), appointed for a two-year period. To carry out its work, FONAFIFO has an Executing Unit, headed by an Executive Director, and five departments or Areas of Action: Environmental Services Area, Credit Area, Administrative Area, Legal Area, and the Resource Management Area.

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[11] *In view of the difficulties of creating the councils, these competencies have not been exercised, so they have been assumed directly by the administration of each Conservation Area.*

[12] *The region can also extend this certificate, needed for transporting timber off the farm and for its export. At this moment, the councils do not exercise this power.*

FONAFIFO currently uses the modality of a Trust Fund to carry out its tasks and operations.[13]

What do environmental services mean?

Traditionally, environmental services (ES) have been understood and defined quite narrowly in terms of facilities that provide water and waste-treatment services, often by the public sector. However, there is a need to move beyond this stage, and to consider ES holistically. In this sense, ES can be defined as a set of benefits generated for society by the existence and dynamic development of natural resources or ecosystems, in this case with a particular focus on forests.

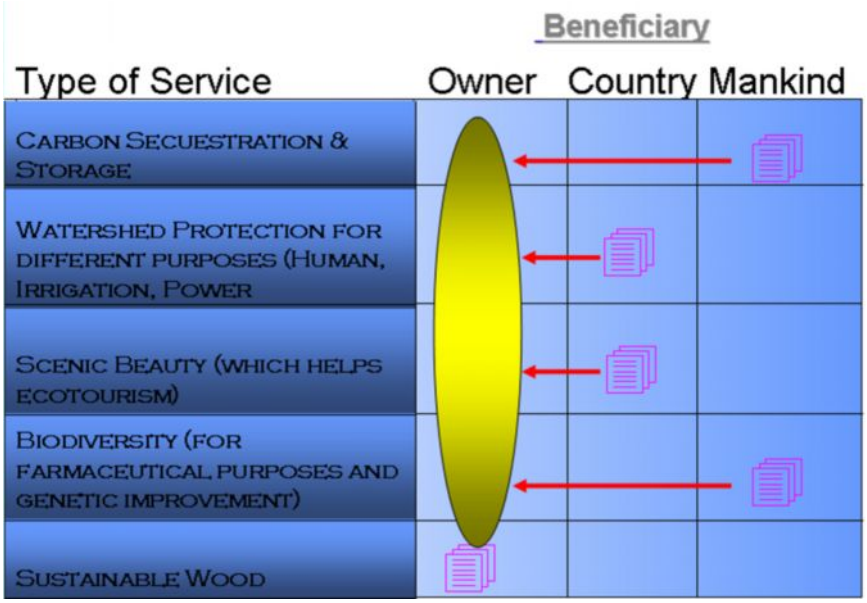
Also, ES can be seen as a set of regulatory functions (on stocks and flows of matter and energy) of the natural ecosystems and some agro-ecosystems that help to maintain or improve the environment and people's quality of life (Odum & Odum 2000; NRC 2004). De Groot *et al*. (2002) define ecosystem functions as *"the capacity of natural processes and components to provide goods and services that satisfy human needs, directly or indirectly"* and additionally, these authors identified 23 ecosystem functions that provide goods and services, making a contribution to the ecological understanding on ecosystem services and a proposal for valuing them.

In the case of forests, they produce oxygen and remove carbon dioxide from the atmosphere, regulate the surface and underground flow of water, smooth out peaks and troughs in water availability, and provide very effective filtration systems for higher water quality (FAO/REDLACH 2004). Additionally, forests support a diversity of native flora and fauna, and provide valuable goods and services, ranging from timber to scenic beauty.

The four main types of ES usually recognized by different authors (Mejías & Segura 2002; Wunder 2005) and pointed out in the Costa Rican Forestry Law 7575 (1996) are: (i) Carbon sequestration and storage; (ii) Watershed protection; (iii) Biodiversity protection; and (iv) Landscape beauty.

[13] *FONAFIFO's Central Offices are located in San Jose and it also has eight Regional Officesin different parts of the country.*

Table 1. Who will provide the environmental services and who will benefit?



Valuation of environmental services

Environmental services valuation can be a difficult and controversial task. In conventional economics it is generally accepted that measures of economic value should be based on what people want or the amount of one thing a person is willing to pay. At present, the valuation of ES in agriculture, forestry and natural resources, and also in relation to ecosystem services is in a state of evolution (Gutman 2003; Lewandrowski *et al*. 2004), probably as a result of the term 'valuing' being understood as attaching economic values to ecosystem services which have historically been treated as public goods and therefore are often seen as having no market value[14].

Attempting to assign values to ES presents several challenges. One of these is due to the tendency of the environment to provide several services simultaneously, and a second constraint is that different types of valuation are measured by different methodologies and expressed in different units, which involves subjective judgments (Fausold and Lilieholm 1996). Although this review does not attempt to enter into a discussion on valuation, it is important to note that people are not familiar with purchasing such services if they are not specific stakeholders, and their willingness to pay becomes less clearly defined. However, this does not mean that ecosystems or their services have no value, or cannot be valued in dollar terms.

The most used methods for valuing ecosystem services are stated preference techniques such as contingent valuation and choice experiments. The contingent method differs fundamentally from other conservation approaches because instead of presupposing win-

[14] *Sell, J. 2005. Swiss Federal Institute of Technology Zurich (ETHZ). Zurich, CH.*

win solutions, this approach explicitly recognizes hard trade-offs in landscapes with mounting land-use pressures, and seeks to reconcile conflicting interests through compensation (Wunder 2005). Additionally, there is a large body of literature about valuation of ecosystems and environmental services (Costanza *et al*. 1997; O'Neill 1997; Pearce 1997; Daily *et al*. 2000; De Groot *et al*. 2002; Pagiola *et al*. 2002; NRC 2004).

Main sector issues and strategy

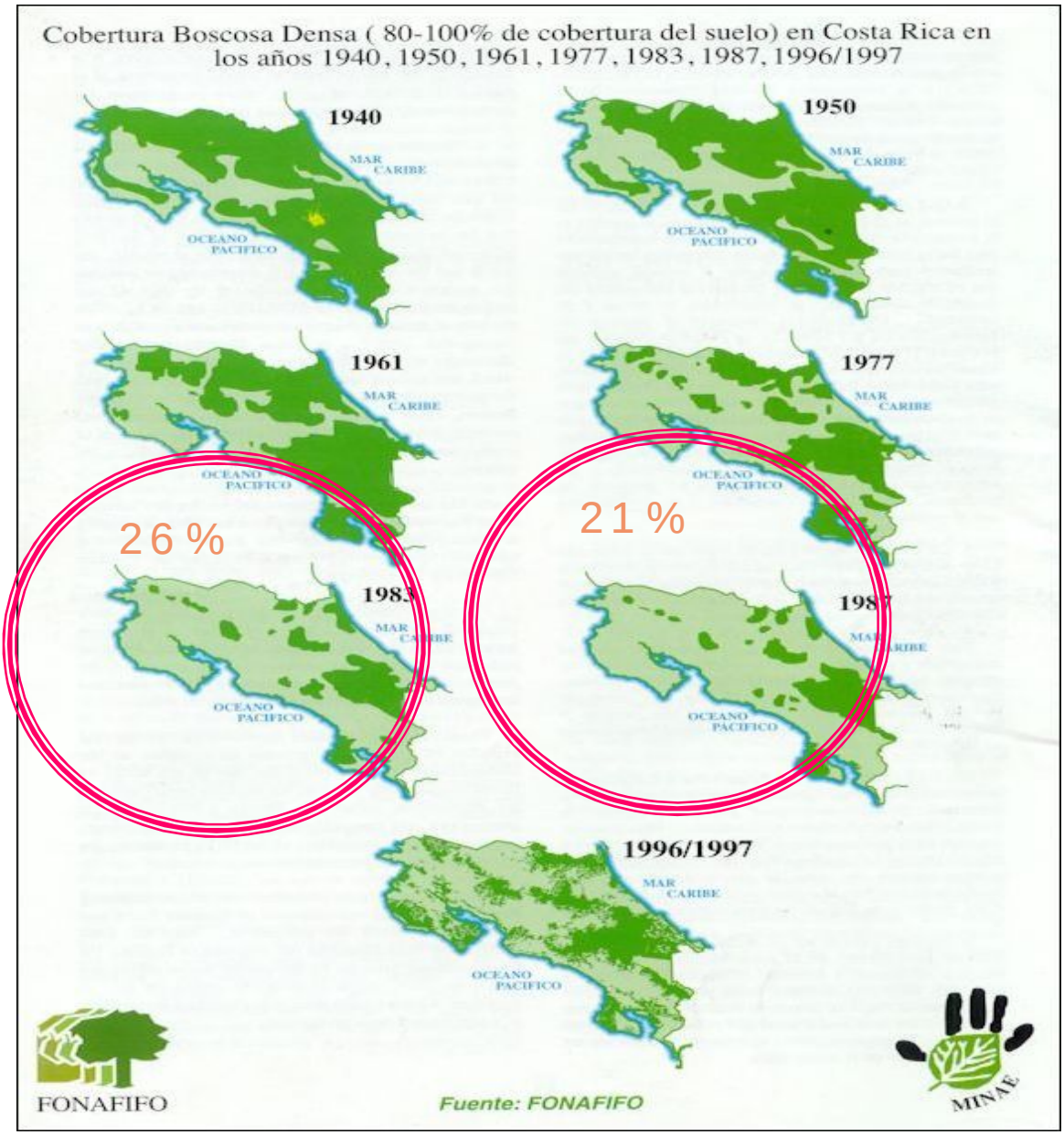
Costa Rica experienced one of the highest rates of deforestation worldwide during the 1970s and 1980s. In 1950, forests covered more than one-half of Costa Rica; by 1995, forest cover had declined to 25% of the national territory. Approximately 60% of the existing forest cover, totaling 1.2 million hectares, is on privately-owned lands outside of national parks and biological reserves.

World Bank estimates indicate that 80% of deforested areas, nearly all on privately-owned lands, were converted to pasture and agriculture. Deforestation was principally driven by inappropriate policies including cheap credit for cattle ranching, land-titling laws that rewarded deforestation, and rapid expansion of the road system.

These policy incentives have since been removed and Costa Rica has become one of the world's leading proponents of environmentally sustainable development. With policies supporting forest conservation and economic factors affecting agricultural production, deforestation rates have slowed considerably.

A World Bank review of deforestation in Costa Rica carried out in the early 1990s identified three principal types of forest intervention in Costa Rica: (i) clear cutting to change the use of lands under forest cover; (ii) selective cutting of large, valuable trees in primary or secondary forest; and (iii) exploitation by owners of pasture areas that contain patches of forest cover. The study confirmed that clear-cutting and selective logging are principally driven by economic interests. While loggers play an important role in such activities, the main motivation for these processes comes from landowners seeking to obtain revenue from timber sales or agricultural activities. Environmental concerns tend to be external to decisions made by landowners when they are not directly related to on-site productivity.

Figure 2. Forest cover change from 1940 to 1996/1997
(Source: FONAFIFO 2005)



Kishor & Constantino (1993) also showed that returns from land use change (i.e. deforestation) are greater than returns from natural forest management. Particularly with low interest rates, the conversion to forest plantations dominates the lower-yielding natural forest management. At higher discount rates, the landowner's greatest profit is obtained by

clear cutting the forest (Chomitz *et al.* 1998). An additional problem in promoting traditional forest production activities is the irregular distribution of incomes generated by wood product sales. In the case of reforestation, it requires an injection of nearly US$600 at the beginning of the rotation – that is, during years 1 to 5 – but the incomes from wood sales are obtained 10, 12 or even 15 year later. Table 2 shows an example of the distribution of the production costs and incomes from reforestation using melina (*Gmelina arborea*) and teak *(Tectona grandis*).

The table shows that the distribution of incomes are unevenly distributed during the rotation period, and therefore small or medium farmers, who normally need continuous incomes to meet their needs, do not find the economic returns sufficiently attractive to invest in small-scale reforestation, making other land use activities (e.g. cattle-ranching and cash crops) the preferred option (FONAFIFO 2002).

Table 2. Distribution of payments by contract type during year 2001

Contract Type	Total Payment (US$)*	Distribution by year 1	2	3	4	5
Forest Conservation Easements	210	20%	20%	20%	20%	20%
Sustainable Forest Management	327	50%	20%	10%	10%	10%
Reforestation	537	50%	20%	15%	10%	5%

* *Source: FONAFIFO 2005. (US$1 = 346 colones on February, 2002). The levels of payments change every year to adjust them due to inflation.*

Costa Rica's efforts to internalize environmental values provided by forest ecosystems date back to 1979, with the passage of the first Forestry Law and the establishment of economic incentives for reforestation. Subsequent laws strengthened incentives for reforestation, broadening opportunities for landowners to participate in reforestation programs and making the program accessible to small landowners within rural areas.

Costa Rica adopted Forestry Law No. 7575 in 1996. It recognizes the four environmental services provided by forest ecosystems, provides the legal and regulatory basis to contract with landowners for environmental services provided by their lands, empowers FONAFIFO to issue such contracts for environmental services provided by privately-owned forest ecosystems, and establishes a financing mechanism for this purpose.

The program of payment for environmental services in Costa Rica

The Payments for Environmental Services Programme (PESP) implemented in Costa Rica is an alternative approach to halting environmental degradation resulting from deforestation in low income nations (Castro *et al*. 2000; Castro *et al*. 2001; Ortiz 2002). Land and forest owners are paid for the environmental services their forests produce when they adopt land use and forest management activities that preserve the forests and biodiversity and contribute to societal wellbeing.

The Costa Rican programme of environmental services aims to protect primary forest, allows the recovery of secondary forest, promotes the reforestation of abandoned pasture and degraded lands, and promotes forest plantations to meet industrial demands for lumber and paper products (Rodríguez Zúñiga 2003).

These goals are met through site-specific contracts with individual small- and medium-sized farmers. In all cases, participants must present a sustainable forest management plan certified by a licensed forester, as well as carry out conservation or sustainable forest management activities – depending on the type of contract – throughout the life of the contract.

Management plans include biophysical information on land, and specific actions for prevention of forest fires, illegal hunting, illegal harvesting and monitoring schedules. Commitments associated with environmental service contracts are registered with the deed to the property, such that contractual obligations transfer as a legal easement to subsequent owners for the life of the contract.

Landowners cede their GHG emission reductions rights to FONAFIFO, to be sold on the international market. It bears note that the PES programme sets different regulations for indigenous territories; experience indicates that indigenous territories have clear land boundaries but are not always under individual title nor necessarily legally established associations as representative of the territory. As a result, FONAFIFO exempts indigenous territories from complying with land ownership regulations (see Table 3).

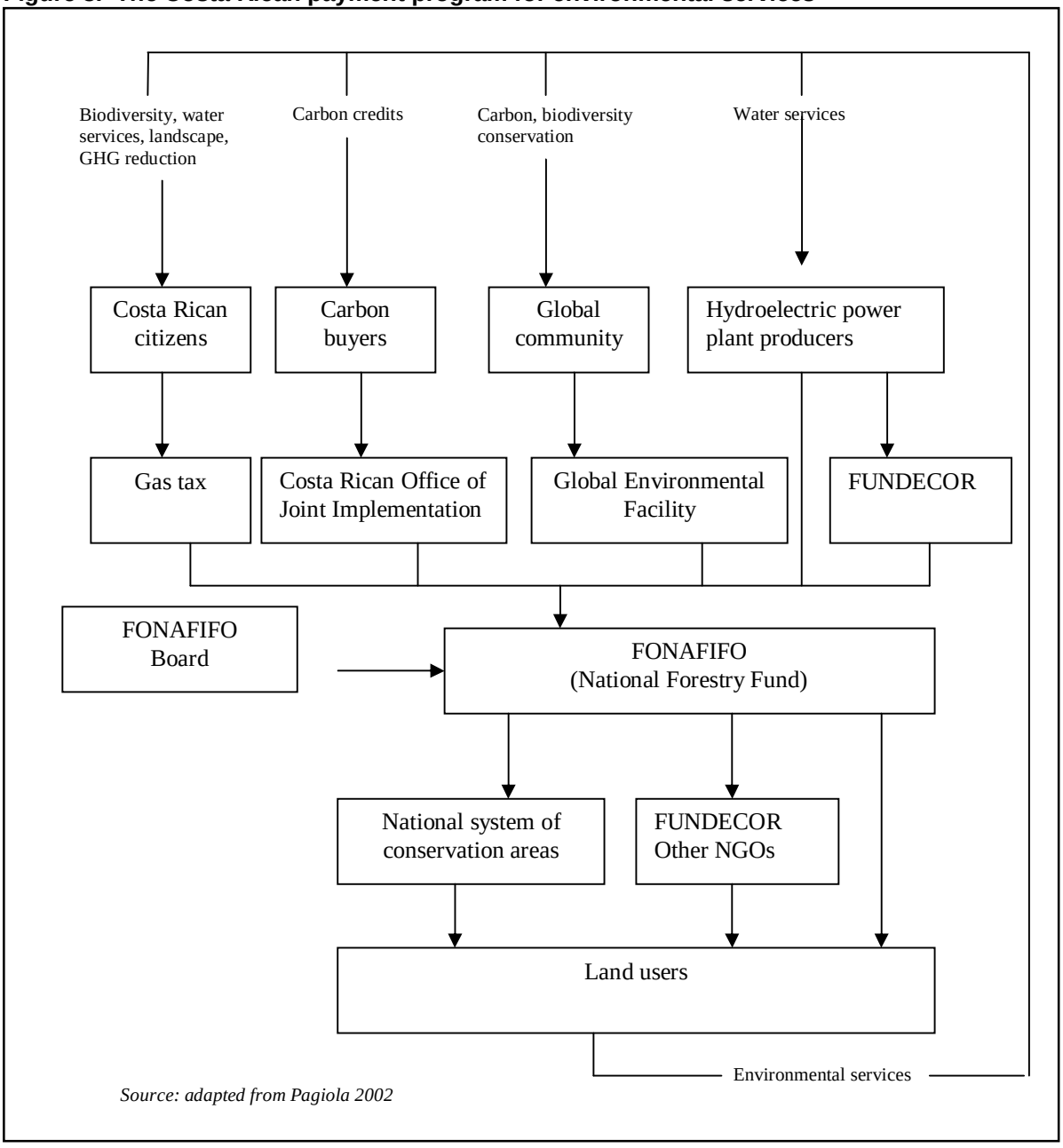
The program functions like a funds transfer system from those who benefit from environmental services towards those that produce such environmental services (Mejías & Segura 2002) (See Table 1 & Figure 3). It was designed as a financial mechanism to promote the conservation of the country's forest resources. It is a program where forest and plantation owners are financially and legally acknowledged for the environmental services that their forests provide to society.

Table 3. Contracts of Payments for Environmental Services by Land Owner Type

Contract	Maximum Area (ha)	Land Owner Type
Individual	300	Individual land owner
Global	300 by land owner There is no limit for NGO	Individual small and medium land owners associated to a local NGO
Indigenous Reserve	600	Indigenous Reserve Development Association.

Source: FONAFIFO 2005

Figure 3. The Costa Rican payment program for environmental services



Source: adapted from Pagiola 2002

The legal basis for the program is Costa Rica's Forest Law 7575, which recognizes the four above-mentioned environmental services provided by forest ecosystems (See Figure 4): (i) Carbon sequestration and storage (mitigation of GHG emissions); (ii) Watershed protection (hydrological services); (iii) Biodiversity protection (conservation); and (iv) Landscape beauty (for recreation and ecotourism). In addition, it has also been proposed that PES be an instrument of wealth redistribution that serves to fortify local economies in rural areas (FONAFIFO 2005).

The Ministry of Environment (MINAE), through FONAFIFO, is charged with channeling government payments to private forestry owners and protected areas. Payments vary according to the type of activity undertaken: [15] reforestation, agro-forestation, forest conservation and sustainable forest management.

Table 4. Distribution of payments for PES during year 2005

Contract Type	**Total Payment (US$)**	**Years of Commitment**
Forest Conservation Easements[(a)]	320/ha	5
Sustainable Forest Management[(b)]	410/ha	10
Reforestation[(c)]	816/ha	15
Agro forestation[(d)]	1.30/tree	5

Source: FONAFIFO 2005.
The levels of the payments change every year to adjust them for inflation:
(a) 20% each year for 5 years; (b) 10% each year; (c) 46% year 1 & 6% year 2 – year 10; (d) 65% year 1, 20% year 2 & 15% year 3.

Payments are made over a five-year period. In return, landholders cede their environmental service rights to FONAFIFO for this period. When the contracts expire, landowners are free to renegotiate prices, or sell rights to other parties. They are, however, committed to managing or protecting their contracted forest for 20 years (or 15 in the case of reforestation). Their obligation is recorded in the public land register and applies to future purchasers of the land.

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[15] *At present, there are three different types of PES contracts. They are:*

- *Forest conservation contracts: US$320/ha (equivalent to $64/yr/ha), disbursed evenly over a five-year period, for forest conservation easements. Eighty-five percent of contracts in the PES programme to date support forest conservation easements, which target the conservation of vegetative cover in primary and secondary forest areas. Contracts are for five years, but can be renewed depending upon fund availability.*
- *Sustainable forest management contracts: US$410/ha, disbursed over a five year period, for sustainable forest management easements. Nine percent of contracts in the ESP programme support sustainable forest management. Landowners must make a commitment to maintain forested areas for a period of 10 years.*
- *Reforestation contracts: US$816/ha, disbursed over a five-year period, for reforestation easements. Landowners must make a commitment to maintain reforested areas for a period of fifteen to twenty years, depending upon tree species. Six percent of contracts in the PES programme support reforestation of degraded and abandoned agricultural lands.*

From a conservation perspective, the PESP provides market-based incentives to conserve natural forest ecosystems. These economic incentives help maintain habitats that are critical to rich, globally important biodiversity, and have the potential to help maintain biological corridors linking national parks and biological reserves.

Approaching forest conservation through the PESP is akin to the system of conservation easements that is widely used in the United States and European countries. From 1997 to 2005, nearly 507,830 hectares of forest have been incorporated into the programme. During this period FONAFIFO has paid approximately US$120 million to private landowners.

Table 5. Payment of environmental services by total area and participants by PES contract type and year

Year	Type of PES					Number of Contracts
	Forest Conservation	Forest Management	Reforestation	Total (Has)	Agro forestry System (Trees)	
1997	88,830	9,325	4,629	**102,784**	-	1,200
1998	47,804	7,620	4,492	**59,916**	-	597
1999	55,776	5,125	3,880	**64,781**	-	622
2000	26,583	-	2,457	**29,040**	-	271
2001	20,629	3,997	3,281	**27,907**	-	287
2002	21,819	1,999	1,086	**24,904**	-	279
2003	65,405	-	3,360	**68,765**	97,381	672
2004	71,081	-	1,557	**72,638**	412,558	760
2005	53,493	-	3,602	**57,095**	513,684	755
Total	**451,420**	**28,066**	**28,344**	**507,830**	**818,897**	**5,443**
(%)	**88.89%**	**5.52%**	**5.59%**			

Source: FONAFIFO 2006

Financing the PES program (funding sources)

Principal sources of funding for the program include a tax on fuel sales, payments to FONAFIFO from private sector firms (renewable energy producers and water blotters) for the conservation of critical watersheds, and through the sale of Certified Tradable Offsets (CTOs) derived from forest ecosystems[16].

[16] *Certified Tradable Offsets (CTOs), or "carbon bonds" are an environmental commodity that provide global environmental and economic benefits, representing internationally recognized*

The fuel tax, also referred to as the "ecotax", is a special tax on the consumption of any crude-oil derivates, passed as part of the new Forest Law in 1996. Originally FONAFIFO was supposed to receive 5% from every fuel sale; however, in 2001 the law was reformed and the fund now receives 3.5% from every fuel sale (Number 8114/2001 - Tributary Simplification and Efficiency Law), which totals approximately US$3.5 million annually.

In addition, through agreements with hydro-electric companies and other private enterprises, FONAFIFO obtains payments for the protection of water resources. Four companies are involved in this program, with a total investment of US$560,000 annually at present (Table 6).

Table 6. Agreements of payments for environmental services between FONAFIFO and public and private firms in Costa Rica

Firm	Watershed	Watershed Area (ha)	Contract Area (ha)	Amount/Annually (US$)
Global Energy	**River Volcán River San Fernando**	**5,870**	**4,311**	**40,000**
Hydroelectric Platanar*	**River Platanar**	**3,129**	**-**	**39,000**
National Power & Light Company	**River Aranjuez River Balsa Lake Cote**	**9,515 18,926 1,259**	**1,000**	**436,000**
Florida Ice & Farm	**River Segundo**	**3,870**	**1,000**	**45,000**
TOTAL		**42,569**	**18,611**	**560,000**

Source: FONAFIFO 2005

**The contract with Hydroelectric Platanar has two modalities: US$15/ha/yr for landowners with land title, and US$30/ha/yr for landowners without land title.*

Additionally, the international community places a high degree of confidence in the PES Programme and the institutional framework developed by FONAFIFO and the National System of Protected Areas (SINAC) to implement it. For example, the World Bank and the Global Environment Facility (GEF), through the so-called Ecomarkets Project, have provided, respectively, a credit line of US$32.6 million and a grant of US$8 million for five years, to help finance the program of payments for environmental services and to strengthen FONAFIFO, SINAC and the local non-governmental organizations involved in the implementation of the program. Besides that, KFW (German Bank) approved a grant of US$1.8 million for seven years.

Another mechanism implemented by FONAFIFO to promote the national and international markets for environmental services are the Certificates for Environmental Services (Certificados de servicios ambientales - CSA). These CSAs are issued for voluntary

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Emissions Reductions of GHG expressed in metric tons of carbon. At present only one sale of CTOs for 200,000 metric tons has been made.

contributions by the private sector, and the funds are used to finance the PESP. The buyers of certificates normally define which forest areas the funds must be applied to. Moreover, a CSA can be used to provide the company with a good image, given that it is cooperating with the protection of forests, and the investment is deductible from gross income for tax purposes by presenting it as an operational cost. A budget of US$1.35 million annually is reported by FONAFIFO (2005) as allocated to this modality.

Altogether more than 23% of the financing for the programme comes from the national fuel tax, 3.7% from agreements with hydro-electric companies and other private enterprises, 64% comes from credit lines via the international community, and 9.3% from CSAs (De Camino *et al*. 2000; Rojas & Aylward 2003; FONAFIFO 2005).

Comments and conclusions

The model of Payment for Environmental Services that Costa Rica has implemented since 1997 undoubtedly has been a pioneer attempt in the Central Americas region, and may be considered as fairly successful.

However, what has really been fundamental in the implementation of the program has been the forest policy institutional framework. This includes, for instance:

- The existence of SINAC that provides minimal infrastructure and institutional presence in each region of the country;
- The National Forest Financing Fund (FONAFIFO) that was established to handle financial issues for forests and natural resources;
- The body of legislation that protects the nation's natural resources, including the Environment Law, the Biodiversity Law, and the Forest Law;
- The establishment of a tax on fossil fuels to pay for environmental services;
- The multiple efforts that have been made to protect biodiversity and generate income from it (70% of tourists visited the public and private protected areas in 2005, and represented an economic revenue equivalent to US$134 million);
- The Costa Rican Office of Joint Implementation (OCIC) that was established to trade carbon emissions in the international market;
- The establishment of a national system to certify good forest management practices, including a National Commission on Forest Certification (CNCF);
- A strong forest owner's sector backed by organizations that provide technical support for reforestation, forest management, and forest conservation.

According to these key factors, the results for Costa Rica have been the following:

- Reduction in the rate of deforestation (particularly from illegal logging from 1992 onwards);
- Increase in contribution to poverty reduction and sustainable development objectives as well as Enhanced Rural Development (7,000 families throughout the country directly benefited from the programme);
- Enhanced forest industry and non traditional forest product processing and export;
- Improved forest cover and reduced land degradation (see Figure 4);
- Contributions to the fulfillment of national, regional and global environmental goals;
- Investment directed primarily to small and medium landholders (average size of farms: 30 hectares for conservation and 85 hectares for reforestation).

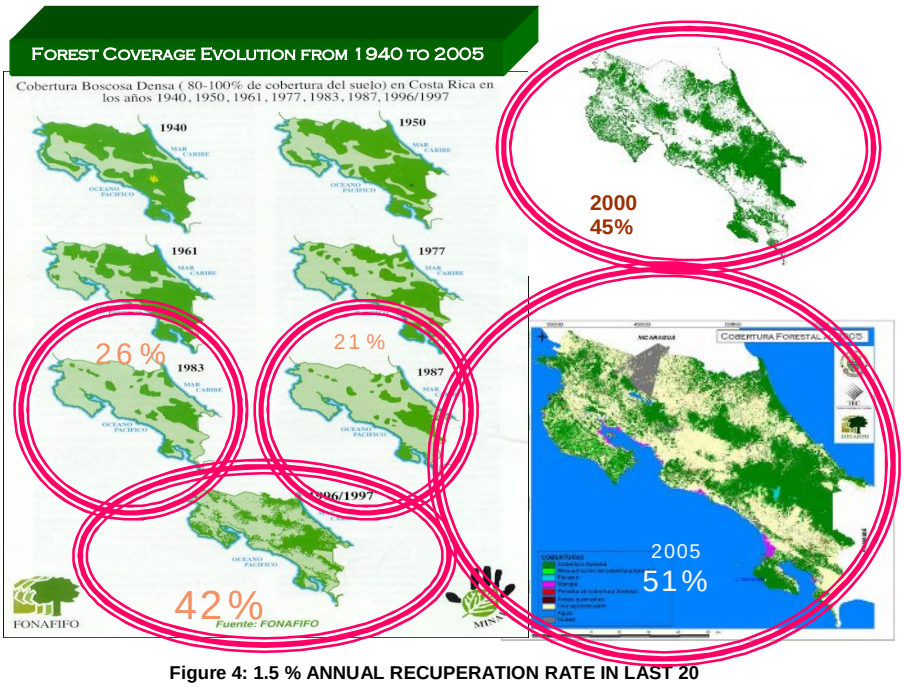

Figure 4: 1.5 % ANNUAL RECUPERATION RATE IN LAST 20

The success of a PES programme depends in great part on pre-existing conditions and may not constitute a cost-optimal instrument in all circumstances. The recommendations, in this case, for countries wishing to pursue similar strategies to Costa Rica, are that PES appears to work best when:

- It is transparent and includes broad participation in the early stages to ensure long-term legitimacy and sustainability. An accelerated institutionalization of PES schemes, without adequately including the interests of small producers, generates restrictions that are difficult to overcome later (Rosa *et al.* 2004);
- Beneficiaries are well organized and land user communities are well structured. Without strong and representative organizations of small producers and local communities, it is difficult to ensure participation that will result in truly inclusive schemes;
- International orientation, eligibility criteria, and operational rules largely determine the capacity for inclusion in the PES schemes. In some settings, greater inclusion requires seeing beyond the forest to link up with other productive activities that are central to livelihoods;
- Have clear and secure property rights, strong legal frameworks, and involve those who are relatively wealthy or have access to resources;
- A broad focus on a wide range of practices for the provision of environmental services can be important for improving, diversifying, and strengthening the livelihood strategies of rural communities. The impact of PES schemes can be enhanced when they promote environmentally sustainable activities such as agro-forestry, agro-ecotourism, non-timber products, and sustainable agriculture;
- The incorporation of local-level perspectives, priorities, and visions empowers local communities and promotes participatory management.

In the year 2006, with the support of FAO, the Netherlands Government, GTZ, the World Bank, IUCN and other international organizations, Central American countries decided to carry out an ambitious programme of forest development, known as PERFOR. One of their strategic objectives is to support each of the countries in implementing its own National Strategy of Forest Financing (ENFF).

The Programme of Environmental Services is one of the most important components inside the ENFF of each Central American country, and based on the experience of Costa Rica and others at the international level, they have decided to implement the following five pillars, given that financial mechanisms are key to the sustainable management of forests:

i. Legal framework: Clear legal regulations and principles that enable the development of the system as a whole, including:
   - Internalization of prices into public service tariffs, land use change regulations and forest concepts;
   - Environmental services payment definition and funding sources;
   - Linkages with international agreements to strengthen the legal framework.

ii. Institutional framework: An adequate administrative structure for the fulfillment of the proposed programme goals, including management and administration of financial resources.

iii. Financial framework: Development of different public, private and mixed sources of funding, using internal and external sources and market-based mechanisms.

iv. Political framework: Including among others things:
   - Processes and instruments for the definition of national environmental policies (goals and targets): National Development Plans, National Forestry Development Plans, and Illegal logging control strategies;
   - Specific policies for the promotion of the management, conservation and sustainable development of natural resources within the scope of national development policies;
   - Use of PES as a mechanism for democratizing distribution of wealth;
   - Coherence of poverty reduction strategies.

v. Transparency and accountability: This includes:
   - Monitoring and verification systems (GIS and others to control the goals and results of PES Programmes);
   - Internal and external technical and financial audits;
   - Forestry regencies (to delegate the control of the projects in the rural zones);
   - Property registry regulations (the contracts should be registered to guarantee the protection of the benefits and responsibilities of the PES Programme).

With the implementation of PERFOR over the next few years, it is expected to have significant impacts, namely benefits accruing from the conservation and sustainable use of forest ecosystems in Central American countries.

PERFOR is expected to empower small and medium-scale private landowners in the conservation and management of forest ecosystems and in making choices that contribute to sustainable development. It is hoped to benefit regional users of hydrological services by supporting the provision of high water quality and hydrologic stability from forest ecosystems. Environmental benefits related to biodiversity conservation, and mitigation of GHG emissions, likewise accrue to the global community.

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3 Experiences in Financing Sustainable Forest Management in Asia-Pacific

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Abstract

Sustainable forest management includes not only timber and non-timber forest products, but also hydrological services, carbon sequestration, ecotourism, and biodiversity benefits. The concept of sustainable forest management has to be broadened to include these values. There are several mechanisms for financing SFM. The immediate and logical means is through strengthening the efficiency of the forestry fiscal system to finance SFM activities using the existing framework. Improving the fiscal revenue systems and the distribution and use of forest revenues can be effective in financing SFM implementation. Forest finance systems that emphasize provision of incentives for SFM and investment in value-added processing industries can also be an effective instrument in increasing the forestry sector's contribution to national development. The role of the private sector (including companies, communities, and individual forest owners) is rapidly expanding as a means to finance SFM through devolution of tenure rights and establishment of different forms of public–private partnerships. But in this age of competition for funds, the changing paradigm of development financing has increasingly moved towards emerging new sources and instruments, particularly relating to payment for environmental services and private capital flows. This shift is linked with new global realities including; market globalization, decentralization of developmental responsibilities, privatization of natural resource management and utilization, a new market-state relationship, globalization of environmental and developmental problems and related inequity, as well as the fuller participation of civil society in policy making and implementation.

Introduction

Forests are complex and dynamic ecosystems, comprising of plants, animals, micro-organisms and the physical environment. They have multiple functions and are valued differently by different groups of users, locally and internationally. There exist conflicting interests and demands by different stakeholders in the management and usage of forests. The sovereign right of nations to utilize their forest resources for economic development may clash with broader principles of trans-boundary global sustainable forest management. The benefits of the free-flowing public-goods from forests and the potential detrimental impacts of their destruction extend well beyond national borders. Yet, there continues to be under-investment in tropical forests.

Resource sustainability together with environmental, social and economic well-being are the fundamental goals of SFM. Compliance with the principles, criteria and indicators of SFM would involve cost increments and its financing is of concern to investors. These rising costs could be attributed to: (i) the need to set aside buffer areas that are protected from logging; (ii) reduced harvesting rates from higher cutting limits; and (iii) reduced impact logging methods and changes in the temporal distribution of costs and revenues (Simula 1997). The costs of low impact logging techniques were assessed and found to range from US$38 to US$60/m^3 in the tropics.

An International Tropical Timber Organization-Forest Research Institute Malaysia research project conducted in the Malaysian Timber Certification Council-certified forest compartment belonging to Kompleks Pengurusan Kayu-Kayan Terengganu (KPKKT) found that overall log production costs inclusive of pre-felling, felling and post-felling activities increased 50% to US$45/$m^3$ (Mohd Shahwahid *et al.* 2002). The higher proportion also includes cost elements from forest management and harvesting plans, pre- and post-felling inventory activities, incremental training to adhere to certification standards of performances and management activities and increased supervision and inspection frequency (not only by the contracted harvesting team and concessionaire but also by the Forestry Department as trustee of forest reserves). The computed shares of the incremental costs are 11.9% by the Forestry Department, 23.5% by the concessionaire and 64.7% by the harvesting contractor. The incremental costs incurred by the contractors during pre-felling and felling activities are for salaries and wages, and material and machinery rental for excavators needed in road construction. The Forestry Department would incur incremental costs from supervisory and monitoring activities during tree marking and mapping operations and road design. The concessionaire's costs were mainly for foregone revenue from buffer areas and wages for supervision and monitoring. In complying with forest certification, there is little evidence of change on annual allowable cut limits, although annual allowable cut volumes have fallen.

Given the above circumstances, governments have to seriously consider multiple approaches to financing sustainable forest management (SFM), including involving international technical and financial cooperation. This paper contributes to the learning process among a selected group of Asia Pacific countries that are actively trying to finance sustainable forest management.

Domestic financing

Use of existing fiscal instruments

Many Asia-Pacific countries are endowed with rich forest resources that, if managed well, could be a sustainable source of revenue to fund national development projects while setting aside some territory for forest replenishing activities. Governments use fiscal systems to extract revenue from forest harvesting, and these can range from a spectrum of mechanisms including: concession fees and royalties for forestry concessions; other forest-related taxes and fees; export duties and fees; and any exemptions and financial incentives given to forest managers and users. Forest fiscal systems can play a vital role in capturing the full value of forestry goods and services and in ensuring that they are effectively distributed in a way that promotes SFM.

In gauging the role of the fiscal system in financing SFM in Asia-Pacific countries, several relevant questions can be considered:

1. How much fiscal revenue is being generated, and of this, how much is being captured by government?

- What are the different fiscal instruments for generating revenues and forest rehabilitation funds?
- What is the level of rent capture?
- How has the revenue from fiscal instruments been used for SFM activities?
- To what extent is the full value of forests appreciated and used in supporting decisions on forest use options?

2. How do we use the revenue raised for forest management?

- How to ensure suitable forest management obligations and procedures are rigorously applied?
- How is forest revenue allocated from central government budgets to more decentralized structures?
- To what extent are forest revenues earmarked for specific SFM uses such as monitoring and law enforcement, tree planting/plantations, watershed and biodiversity conservation, and R&D?

3. How should we manage the politics of fiscal reform processes?

- What processes are used to define and implement appropriate forest fiscal systems, and how do we identify who should participate?
- How do we build coalitions among influential stakeholders and sequence reforms to overcome vested private sector and political interests?

4. How do we define the appropriate mix of fiscal instruments to generate forestry revenue?

- What is the right mix of instruments that meet the basic criteria of economic efficiency, administrative feasibility (in terms of revenue collection and use, reduced corruption, and monitoring and control) and that can support SFM?
- What provisions can or should be made to introduce specific incentives into the forest fiscal system for sustainable forest management - for example, performance-based refunding of deposits and continuous eligibility for harvesting license applications?

Current state of forest management practices, forest revenue collection and use in selected Asia-Pacific countries

Cambodia

In the past, substantial areas within Cambodia had been allocated as timber concessions to various companies from within the region. Concessionaires and licensees have not been rigorously following the harvesting and management practices detailed in forest management plans. Enforceability is an issue owing to institutional and financial constraints. Forest fiscal instruments utilized with timber and non timber forest product (NTFP) extractions remain an important contributor of state revenue. The main sources of revenue are royalties and premiums (San & Net 2003). The forest royalties and premiums have to be deposited into a special account at the National Bank of Cambodia, prior to forest product extraction.

When forest products are traded, an export service charge of about 1% FOB price is further charged. These payments are made to different agencies (and possibly used for different

purposes). Royalty payments are assigned to the annual national budget, and premiums and export service charges are channeled to the National Forest Development Fund (NFDF). The former serves to finance national development activities, including the annual budget of the Forestry Administration Agency. The latter is dedicated to forest development activities such as forest plantation establishment.

In the review of the KPMG's report on "The Equitability of the Forest Taxation System in Cambodia," Peter Cardellichio (as quoted by San & Net 2003) provided a detailed analysis of the profitability in the Cambodian wood processing sector, and used it to determine the equitability of the forest taxation system. If the Cambodian system is equitable, it should assure the Government receives fair economic rent or stumpage value for the timber resource. Border-equivalent log prices look to be higher than veneer prices in log-equivalent terms. FOB prices for hardwood logs in April 2001 were in the range of US$165 to US$185/m3 for Sabah and East Kalimantan. KPMG reports a log price (derived from the selling price of veneer) of US$136 for March 2001. Thus, by converting logs to veneer, the potential lost income was substantial. Not only was revenue significantly less, but the costs incurred in getting the wood to market were much higher.

Indonesia

Based on Indonesian Regulation No. 34 of 2002, paragraph 3, section 48, the government attaches three basic fees to forest production (Sarsito *et al.* 2003):

i. Forest Utilization Business Permit fees that are based on the area of the forest allocated in the permit and are paid upon the granting of the concession, typically costing US$3 to US$10 per ha. This fee is 80% redistributed regionally (16% to the province and 64% to the producing district) and 20% to the central government.

ii. Reforestation Funds involve a fee per m^3 of wood harvested. This fee varies by region and species group. The rate for the higher priced Meranti species group harvested is US$16 per m^3 in Kalimantan and Maluku, US$14 per m^3 from Sumatra and Sulawesi, and US$13 per m^3 from Nusa Tenggara and Papua, while the rates of the mixed woods are US$13 per m^3 from Kalimantan and Maluku, US$12 per m^3 from Sumatra and Sulawesi, and US$10.50 per m^3 from Nusa Tenggara and Papua. These funds are 40% allocated to the provinces and the rest to the central government (60%). Trends during 1997-2002 suggest that the reforestation funds ranged from 28% to 46% percent of total timber revenues (Table 1).

Table 1. Timber revenues collected in Indonesia (1997–2002)

Year	Reforestation Funds (%)	Forest Resource Tax (%)	Total (US$)
1997	33.2	66.8	234,891,284.51
1998	27.7	72.3	296,742,945.10
1999	37.4	62.6	256,697,748.73
2000	46.1	53.9	268,176,560.46
2001	28.4	71.6	373,185,853.85
2002	28.6	71.4	333,270,732.57

Source: Sarsito et al. 2002

iii. The Forest Resource Tax is a royalty on logs charged on the basis of volume that also varies by region and species. It is calculated by multiplying the check price (local market price for the lowest quality log) by a "rent capture" factor of 10%. These royalties are 80% allocated to the region (16 percent to the province, 32% to producing districts, and 32% to other districts), and 20% to the central government. The rates are US$6.25 per m³ for the entire country except Nusa Tenggara and Papua, where it is US$5.17 per m³ for the Meranti group and US$3.75 per m³ for the entire country except Nusa Tenggara and Papua, where it is US$2.76 per m³ for mixed wood.

Recent interest in the fiscal balance between the central government and the regions has led regional governments to impose special levies in a bid to raise revenue capture from forestry.

In Indonesia, the issues and problems that beset the forestry fiscal system include the lack of an adequate information base and the extent to which the state is capturing adequate rent levels from the forest or otherwise. Rent would be much more effectively appropriated if collected by the government rather than by the concessionaires. When governments capture less rent than they should, this would likely encourage misappropriation of funds. The extra profit will not necessarily be claimed by the concessionaire alone, but instead would be appropriated by parties with vested interests, hence preventing the use of these funds for the welfare of the state, including for SFM (Sarsito *et al.* 2002). This limits the resources available to forest departments for their tasks of forest protection, conservation, monitoring, and enforcement, which in turn encourages illegal logging, encroachment, and other forest crimes. Further low levels of rent capture may also necessitate the state to open up a larger forest area to obtain the same amount of revenue, unwittingly encouraging higher rates of logging.

Data are insufficient to accurately evaluate whether current fiscal revenue rates are achieving optimal levels. In the case of Meranti harvesting, the Indonesian government can collect a maximum of US$22.25 per m^3 ($16 for the reforestation fund and US$6.25 for the forest revenue tax) in Kalimantan or Maluku. According to Sarsito *et al*. (2002), using domestic prices, the government captures only 55% of available resource rent, and far less if the higher timber prices provided by the ITTO is used, and less still if higher extraction costs are assumed. By the fact that districts now collect revenues from timber, government rent capture may also be higher. Given the great uncertainty over timber prices, timber extraction costs, and current fees levied by districts, which are either unknown or disputed, it

is impossible to make a definitive claim as to whether current Indonesian timber revenues are set at optimal levels or not.

Indonesia has a new method of revenue collection – the Penata Usahaan Hasil Hutan – that involves collection based on cruising reports from concessionaires indicating the volume of legally extractable commercial timber within a specified area, rather than retrospective assessments based on the volume of logs carried out of the area. If successful, and if provincial-level forestry offices cooperate, this would increase timber revenues, since collection would be based on the volume of legally extractable commercial timber within a specified area rather than the (smaller) percentage of trees that concessionaires now remove from the forest.

Malaysia

One important source of self-sufficient financing of SFM is the efficient use of fiscal instruments in revenue collection and use. One approach is tendering the extraction rights of timber and non-timber products, whereby the criteria to win a tender are licensees with proven records of good practice compliance and the provision of bids equal or in excess of the reservation price computed after appraising the stumpage value using market information. Central to this issue is the level of rent capture attainable from forest extraction activities. Investigations conducted in the Asia Pacific region suggest that rent capture success is variable. Rent capture is improving in Malaysia with increasing use of the tendering system and with declining area of annual forest opening.

However, a mechanism is needed to ensure that adequate proportions of the revenue collected are used in financing the planning and management of the forest resources.

Direct government funding of SFM

With the rising concern surrounding multiple use forestry, governments in the Asia Pacific region have intensified efforts to finance biodiversity conservation, watersheds and water catchment protection, water quality improvement, as well as the existence of a sustainable supply of forest products. Central and provincial governments have provided funding for forest management programs through pooled government revenue systems, of which the forestry sector has contributed annually through fiscal systems like forest premiums, royalties and timber export levies. For instance, in Peninsular Malaysia, cumulative expenditures on forest development amounted to US$200 million during the 1994-2004 period (Forestry Department Peninsular Malaysia 2004). These funds supported 110 development projects under 11 development programs as follows:

i. forest resource management;
ii. forest resource valuation;
iii. natural forest development;
iv. forest plantation development;
v. non-wood resources;
vi. agro-forestry;
vii. conservation and protection;
viii. eco-tourism and forest recreation;
ix. IT and K-forestry;
x. human resource development; and
xi. infrastructure and facilities.

Leasing arrangements for SFM

Asia-Pacific Governments are enticing community forest owners into SFM by compensating local community land owners for transferring land rights to forest conservation activities. An illustration from Vanuatu is provided in Box 1.

Box 1. Leasing community forest for protection and conservation purposes

Traditional owners of the forest and the Vanuatu Forest Department have been subjected to increasing pressure from overseas interests to sell the rights to log their forests while the world community has been exerting pressure for forest conservation and protection. A solution has been to compensate the local community land owners for transferring the land rights for forest conservation activities.

The Erromango Kauri is endowed with the valuable *Agathis macrophylla* (kauri tree) and the Government intends to protect this species in its natural habitat and to allow further ecological studies to be undertaken. The establishment of the Erromango Kauri Protected Area has been secured for conservation through a leasing arrangement between local land owners and the Vanuatu Forestry Department. The development of the compensation package and of the land lease agreement was carried out together with the landowners. The lease payments are designed to compensate the landowners for the royalties that they could otherwise have earned from allowing their forests to be logged. The discounted value of the lease for the EKPA computed at 100 vatu/ha/year was estimated to range from ~ 3,000 vatu/ha to 5,000 vatu/ha involving 3,257 ha. Funding for the lease payments for the first five years has been provided by a grant from the European Union. In this way, the international demand for forest conservation has been mobilised into compensating from local people.

But several issues can emerge in such leasing arrangements. Some people other than the landowners can be marginalized through these arrangements. These people who may have prior informal recognised use rights to resources may be denied access. This could create conflict within communities. The Forestry Department may have to continue to provide support to the wider community with alternative livelihood initiatives. *Source: Tacconi and Bennett 1997*

Domestic private sector investment

In many Asia Pacific countries, there is a shift towards greater participation by the private sector in forestry. Not only are countries encouraging increased private ownership, but they are also attempting to attract more private interests in forest management. A greater reliance on market-based approaches and the promotion of public-private partnerships has great potential to guide forest operators towards more efficient and sustainable management. Public-private partnerships become realistic when the necessary preconditions have been met.

Several questions have to be tackled to ensure successful public-private partnerships in forest management:

i. Can the private sector secure property rights over forest resources and their products and services? Failing to deal with this would serve as a key structural barrier to private sector investment.
ii. Can governments help address inherent barriers to private investment in forest management, such as: (a) investment risks and uncertainties; (b) cash-flow problems associated with long-rotation periods; and (c) access by the private sector to credit and technical forestry support?
To encourage interest from the private sector in forest management requires stable and reliable rules and conditions governing investment. In designing policies to attract domestic and international private capital, attention should be paid to three general issues:

- attracting more private capital to support sustainable development goals;
- ways to maximize the benefits of such private capital; and
- ways to minimize the detrimental consequences (Jun and Brewer 1997).

The private sector's role in forest management has changed and evolved in response to the dual needs and aspirations of business enterprises and that of social concerns around forest conservation. There exist five categories of private sector involvement in SFM:
i. Single-stage process companies that specialize in only one aspect of forest management activities (e.g. harvesting or milling or forest regeneration/rehabilitation);
ii. Integrated companies who may own or manage the forest, as well as the processing and production of end-products;
iii. Large companies characterized by the presence of reasonable technical and managerial capacities and the ability to bear financial risks involved in forest management;
iv. Multi-national companies with the finances, influence, access to both forests and global markets, and skills. They can afford good forest management practices and can be responsive to the needs of external stakeholders; and
v. State enterprises are usually restricted to state funding and policy direction and are often subsidized.

An example of a single stage process company's involvement in financing through the outsourcing of sustainable timber is that of the Outgrower Farms of Clonal Trees of ITC Bhadarachalam Paperboards Ltd. (Box 2).

Box 2. Outgrower Farms of Clonal Trees of ITC Bhadarachalam Paperboards Ltd.

ITC Paperboard and Specialty Paper division operates an integrated pulp and paper mill, Sarapaka, in the Khammam district of Andhra Pradesh. This mill was established in 1979 with an installed capacity of 65,000 mt of pulp and 182,500 mt of paperboard and paper per year. The requirement of cellulose raw material of ITC-PSPD is about 400,000 mt p.a. which will grow to 800,000 with the planned increase in its production capacity and product range. The mill currently meets its material requirement from various sources.

An interesting feature of ITC Bhadrachalam Paperboards Ltd. is the sponsorship and support the company provides to promote outgrower (small farmer) involvement in the production of pulpwood from genetically engineered and high yielding varieties of pulpwood species. The company intends to outsource pulpwood production under suitable arrangements. The company experimented with a bank loan scheme supported by the National Bank of Agriculture and Rural Development (NABARD) to promote farm forestry. 8,441 ha of tree plantations were established involving 6,185 farmers in 1,138 villages with a comprehensive package of quality seedling stock, technical extension services and offers of a buy-back guarantee at an agreed price. Despite this, the company's overall experience was not very satisfactory as it faced logistical problems, particularly in getting the farmer's loans sanctioned and in receiving far less production from the intended target (productivity 6-10 m^3/ha/yr) as the farmers sold their produce elsewhere. The scheme was discontinued in 1995. The company then launched a tree improvement programme focusing on producing fast growing and disease resistant clones. The company launched a clonal plantation programme with the participation of 6,372 farmers at the end of 2002. 11 different Eucalyptus clones called (Bhadrachalam clones) were supplied commercially to farmers. Survival rate was high at 95% and the MAI of clonal plantations ranged between 20 and 58 m^3/ha/yr. The farmers were able to earn a net profit of Rs. 50,000 to Rs. 150,000 per ha depending on site quality and management inputs in the first cutting after 3 years. Profits increased in subsequent cuttings, since the cost involved in maintaining a coppice crop is lower. About 40% of the pulpwood requirements of the company were being met from the clonal tree farms. The company expects that its entire pulpwood requirement can be supplied by the clonal tree farms in the selected districts of Andhra Pradesh State. Some of the important aspects of the case are: voluntary mobilization of investment for tree farm development; research, technological development and extension support by the wood processing company; increased productivity of clonal plantations; employment and increased income for local people; reduction of pressure on natural forest for raw materials; and mutually beneficial collaboration between the company and the farmers.

Source: Freezaillah et al. 2004

Other cases of private sector involvement in financing forest management are provided in Box 3.

Box 3. Other case studies

PT Suka Jaya Makmur is an integrated company that operates a 171,340 hectare forest concession in West Kalimantan Province of Indonesia with veneer, laminated board, block board, moulding and lumber core processing capacities. The company maintains a high standard in its forest management practices financed by its operations.

Pacific Timber Export Corporation of the Philippines is an integrated company that operates a timber license/concession over an area of 34,000 hectares. The concession consists of rainforest and is operated under a strict selection system of management whereby wood is processed into sawn timber, plywood and wood works for building. The forest management practices are financed by the company's operations.

Samling Plywood (Baramas) Sdn. Bhd. of Sarawak, Malaysia, is a large company that has production and technical capacities in both forestry and plywood processing. It has a large forest concession of about 200,000 hectares. It is running a woodworking technical training institute and has the ability to bear financial risks involved in forest management, including those of obtaining certification.

Vanimo Forest Products Ltd. in Sandaun Province of Papua New Guinea is a private operation undertaken by a multi national corporation on contract with the Government, within the Timber Rights Purchase System. The forest covered in the contract is customarily owned by the tribal communities. Log harvesting follows a system of selective cutting, part of which is converted to sawn timber.

Source: Freezaillah et al. 2004

As these examples show, governments can influence the level of private sector investment in SFM through monetary, fiscal, and debt-management policies. There are many examples of successful instruments.

International funding

Foreign private sector investment

Questions needing answers include: (i) How is foreign investment linked to environmental degradation and negative social impacts from conventional forest management or, conversely, positive impacts of sustainable forest management (SFM)? (ii) To what extent could foreign investors pressure companies to comply with SFM?

Foreign investments such as foreign direct investment and portfolio investment (bond and equity) in forestry enable companies to gain wider access to the capital market and thereby to raise funds for expansion, diversification, and modernization and in seizing opportunities

for growth in Asia Pacific countries. The flows of foreign investment to forestry in these countries are as of yet not very well documented. In Malaysia, it was found that foreign investment holds just over 3 percent of the market capitalization of Malaysian companies with forest and timber-related activities listed on the Kuala Lumpur Stock Exchange (KLSE) (Grieg-Gran *et al.* 1998). While this is a small relative to other sources of financing, it does play an important role in meeting specific needs.

These companies have earmarked foreign investments towards financing the acquisition of forest concessions and implementing required forest management activities in both domestic and off-shore operations. In Papua New Guinea, Malaysian timber companies invested over US$509 million in the forestry sector between 1991 to 1996 (Grieg-Gran *et al.* 1998).

In other cases, companies used the opportunity to raise funds, through equity issues, to finance the development and expansion of processing capacity as well as through other mechanisms such as tax exemption incentives. Through reverse takeovers, companies have acquired large holdings in listed companies that are engaged in wood processing with the intention of gaining tax advantages as logging profits are subject to tax at the full rate, whereas downstream processing activities receive tax concessions (Box 4).

Box 4. Rimbunan Hijau's attempt at financing via equity issue

Rimbunan Hijau, which was the largest concession holder in Sarawak (around 1,821,085.39 hectares), owns about 70% of the listed company Jaya Tiasa. The latter has been receiving discounts of 15-20% on the timber from Rimbunan Hijau, as well as access to its concessions. In 1996, Jaya Tiasa Holdings Berhad announced the proposed acquisition of 728,434.16 hectares of timber concessions in Sarawak for RM566 million via an equity issue. By injecting its timber concessions into Jaya Tiasa, Rimbunan Hijau would enjoy direct tax savings since Jaya Tiasa's plywood operation enjoys pioneer status and thus qualifies for tax concessions. Rimbunan Hijau would otherwise have to pay the full 30% corporate tax for timber sold to Jaya Tiasa for its downstream activities.

Source: CLSA 1996 as quoted from Grieg-Gran et al. 1998

Impediments to private international financing are the environmental and social issues tagged to forestry. Many green and ethical funds avoided tropical forestry due to its track record on environmental and social impact performance, though their criteria have been slightly improved with the introduction of certification. There is scope to use foreign investments as leverage for addressing the gap between financial returns from investment in forestry and the social and environmental impacts.

Investors, especially those concerned with SFM, could use this opportunity to pressure existing companies engaged in conventional forest management to improve aspects of their performance. This move is similar to the buyers' groups set up in a number of countries which work with suppliers in their countries to induce companies to apply for certification. The form of such pressure depends on the legislative framework for corporate governance and shareholder rights and responsibilities in the countries concerned (Grieg-Gran *et al.* 1998). Investors could opt for "constructive engagement" to discuss the need for compliance with SFM principles and the necessity to seek independent auditing, including certification. However, this approach would only be feasible if a number of institutional investors worked

together. An important factor is if investors are able to clearly see the favorable connection between SFM and financial performance.

There are indications that firms obtaining FSC accreditation have benefited economically. Peninsular Malaysia has imposed a ban on the export of logs in a bid to encourage domestic processing and to meet local demand in a log-supply deficit situation. Only processed timber can be exported. Hence, Perak Integrated Timber Complex (PITC), which is involved in the production of sawn timber and its export to niche markets requiring FSC labeled supplies, has received orders at premium prices. These higher prices occurred due to direct ordering by international manufacturing firms.

As mentioned earlier, considerable financing will be required for widespread adoption of sustainable forest management. Private foreign investment could meet the demands for increased financing access.

International public sector investment

Current practice in financial cooperation with developing countries (ODA) recognizes the North-South gap in financial capacity, and can be considered as a sort of *ad hoc* transfer payment from the developed countries to developing countries. However, such ODA flow is uneven, unsystematic, and unreliable.

ODA typically supports environmental conservation, social development, infrastructure, capacity building, and technical assistance. More recently there is a growing interest in supporting the internalization of global externalities.

However, the priorities and strategies for cooperation from donor countries and multilateral agencies involved in ODA provision may not always match those of recipient countries. This situation underscores the importance of formulating country-driven national forest programmes as the basis for international cooperation.

ODA has remained one of the main sources for financing forestry operations in the Asia-Pacific developing countries. ODA generally carries conditionality linked to the preconditions for effective implementation, including absorption capacity and the degree of commitment (financial and non-financial) of recipient countries.

Among the popular ODA agencies supporting SFM in Malaysia are DANCED, DANIDA, UNDP, ITTO, GEF and GTZ. ODA supports certification programs as a means of applying SFM. In the Solomon Islands, for example, landowners simply cannot meet the cost of certification. It is very expensive to be certified and thus NGOs work as group managers to certify group projects in order to share the cost. Even with that, certification would not be possible without funding support from donors such as EU, NZAid, UK Foundation and International Organization for Development Co-operation (ICCO). With the closure of the Soltrust and SWIFT programs, it is highly unlikely that the timber producers they supported for certification previously will recertify in the future.

Creation of new markets for environmental services

Creation of markets for environmental services offered by forests in Asia-Pacific countries could provide a new source of SFM financing. The aim is to assign value for services provided by SFM activities previously unrecognized as tradable commodities by

conventional markets (Costa *et al.* 1999). Their principal aim is to provide forest users and managers with a means of recovering the incremental costs of SFM, by compensating for localized costs that provide trans-boundary benefits. This creation of new markets seeks to provide a direct market-based incentive for forest users to make the transition from unsustainable to more sustainable forestry methods. These financial incentives created for forest users and managers can provide a range of services other than solely timber production. But it should be noted that the funding potential for this mechanism is seen to be more limited than other categories.

An example of such an environmental service market is that created for the commoditization of carbon sequestration under the Clean Development Mechanism (CDM), a new financing possibility emerging from the Kyoto Protocol.

There are two concerns that must be addressed if the creation of new markets for environmental services is to serve as an effective financing source for SFM:

(i) Unequal or preferential treatment: Similar forests may not be treated in the same way due to site-specific factors, particularly location and possible beneficiaries. For example, forests that are located in watersheds supplying fresh water for big cities will be valued differently from forests in watersheds around agricultural zones; and

(ii) Negative consequences: Each instrument inevitably emphasizes capturing a particular aspect or aspects of forest benefits over others. If investment decisions are too narrowly focused on short-term benefits, and the wider goals of sustainability are not kept in sight, the results could actually impede SFM. This problem is particularly associated with forest benefits at the global level. For example, the commoditization of the carbon sequestration potential of forests under inadequate policies could lead to the clearing of natural forests into fast-growing plantations, impacting negatively on SFM.

Carbon offsets

Human-induced emissions of greenhouse gases (GHGs) in the atmosphere are a challenge to the international community. But given that GHGs are a transboundary issue, emissions at one point can be absorbed or offset elsewhere. Although substantial CO_2 emissions are caused by fossil fuels, forest loss is also an important contributor. Forests are major carbon sinks and their rapid loss accelerates the accumulation of GHGs. Net emissions of GHGs may be reduced by enhancing natural carbon sinks. Forests act as carbon sinks by sequestering carbon through photosynthetic processes and trees grow faster in the tropics than in temperate regions.

Two forestry-related approaches in offsetting GHG involve either sustainable use of existing forests (such as well-managed eco-tourism or reduced impact harvesting) or reforestation. Polluting countries may initiate reduction of carbon emissions in another country through emission offsets. Offsetting GHGs from other sources may be undertaken by private companies or by governments as part of bilateral or multilateral arrangements. The funding agent provides funds for reducing emissions through technologies that offset emissions or by enhancing sinks through forest protection. This may involve compensating net benefits in advance and through the provision of additional funding for afforestation programmes. The funding agent gains the opportunity to amend GHGs emission schemes, accessing corporate tax relief while also acting as a marketing pitch.

An example of a carbon offset project financing forest management is the case of New England Power (NEP), a coal-burning utility from the UK providing funds to Innoprise Corporation Sdn. Bhd. (ICSB) to implement a set of reduced impact logging (RIL) guidelines to mitigate damage to soil and vegetation by 50% on 1,400 hectares of virgin forest in Sabah, Malaysia in 1992 at a contract price of US$452,000. Rainforest Alliance acted as environmental auditor for NEP, Forest Research Institute Malaysia acted for ICSB, and independent auditors from the University of Florida and CIFOR monitored compliance of the RIL harvesting guidelines in the field. Research to quantify the carbon savings of RIL and conventional logging was conducted in six paired, randomly selected plots of 40 hectares. Systematic biomass measurements were made of all organic components of the forest vegetation, including roots, leaf litter and soil carbon. The comparisons in harvesting processes and parameters are given in Tables 2 and 3.

Table 2. **How does RIL reduce damage compared to uncontrolled conventional logging?**

No.	Harvesting Process	Logging methods	
		RIL	Conventional
1.	Climber Cutting	Yes	None
2.	Comprehensive Harvest Planning		
	Tree marking and mapping	Yes	None
	Road planning	Yes	Minimal
	Skid trail planning	Yes	None
	Log landing planning	Yes	None
3.	Directional Felling		
	Avoiding potential crop trees	Yes	None
	Towards existing natural gaps	Yes	None
4.	Skidding and Winching		
	Restricted blading	Yes	None
	Winching distance/cable pulling	Yes	None / drive direct to stump
5.	Strict Supervision of Harvest Operation		
	Adherence to RIL guidelines	Yes	No guidelines
	Continuous damage	Yes	None
6.	Assessment and Evaluation		
	Controlled damage	Yes	No
7.	Cross-drain Installation		
	Soil erosion control	Yes	No
	Diversion of surface run-off	Yes	No
	Water quality maintained	Mostly	No
8.	Removal of Stream Crossing Structures		
	Prevent water ponding		High occurrence of water
	Landing re-shaping		No

Table 3. **Comparison between Conventional and RIL parameters**

	Conventional	RIL
Trees ha^{-1} extracted	13.60	8.80
Volume m^3ha^{-1}extracted	152	103
Proportion (%) of area with soil disturbance	0.17	0.07
Skid trail density (m ha^{-1})	199	67

Proportion (%) of trees (5-60 cm dbh) killed during logging	0.41	0.15
Density of undamaged dipterocarp trees (5-20 cm dbh) ha^{-1}	49	104

Source: Pinard et al., 1995

As physical productivity declines with RIL, so does physical damage. Prior to logging, dipterocarp forests store some 330 tonnes of carbon ha^{-1}. The retention of carbon for the first 10 years after RIL was 185 tonnes ha^{-1}, which was much higher than that after conventional logging of 120 tonnes ha^{-1}. The potential carbon savings from RIL are at least 90-94 tonnes ha^{-1} or 328-343 tonnes of carbon dioxide ha^{-1} over the next 40 years.

The incremental cost of sequestrating carbon, from US$3.40-3.55 $tonne^{-1}$ C and US$0.93-0.97 $tonne^{-1}$ CO_2, is relatively cheap and provides an alternative cost-effective way for emitters to make carbon offsets. Issues about property rights and forest use have yet to be fully resolved (Table 4).

Table 4. Cost of RIL carbon

	Quantity or Cost (US$)
Area (ha)	1,415 ha
Time (years)	60 years
C-gained ha^{-1}	90-94 tonne
CO_2 gained ha^{-1}	330- 345 tonne
Cost ha^{-1}	US$ 320
Cost $tonne^{-1}$ C	US$3.40-3.55
Cost $tonne^{-1}$ CO_2	US$0.93-0.97

Note: 1 tonne C =3.67 tonne CO_2
Source: Awang Mohdar et al. 1999

Conclusion

Recent trends in the commoditization of forests to benefit owners and managers through the creation of markets offers new possibilities to capture at least part of the value of the environmental and social benefits of forests previously not recognized by the market. Forest can be managed for not only timber and non-timber forest products, but also for hydrological services, carbon sequestration, ecotourism, and biodiversity benefits. The concepts of forest management must expand to include these values.

There are a number of modes of financing SFM. The immediate and logical means is through increasing the efficiency of existing forest fiscal systems to be used in self-financing SFM activities in the Asia-Pacific region. Another financing source is that of private domestic investment by forestry companies as they expand forest concessions and downstream production capacity. External financing sources could also be raised through private and public international investments in SFM activities. These are the conventional financing mechanisms. New and non-conventional financing mechanisms are now being developed to involve the marketing of environmental services of forests. To ensure that these financial mechanisms achieve their intended objectives, governments in the Asia-Pacific countries must mobilize domestic resources and develop strategies to increase the availability of private and public financial resources for SFM. This is in concert with creating a more favorable investment climate for the private sector, domestic as well as international. In the case of domestic public sources, the major goals are to increase revenues from forest products and services, and to ensure the necessary reinvestment for SFM occurs.

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4 Strategies for sustaining Joint Forest Management: lessons from Tamil Nadu Afforestation Project, India

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Abstract

Joint Forest Management (JFM), a co-management programme between government forest departments and local people, has been hailed as a successful strategy in arresting forest degradation and promoting socio-economic development of forest fringe villages in India. Sustaining the programme, however, was found to be a major challenge in the absence of lasting institutional mechanisms and regular income flow to the participating communities. The Tamil Nadu Afforestation Project (TAP) addressed these challenges by focusing on: (i) providing stronger rights and responsibilities for local forest management; (ii) developing specific institutional measures toward empowering rural poor and women; (iii) ensuring improved sectoral integration and flow of additional developmental assistance; and (iv) promoting flexible and effective programme implementing organizations and stakeholder capacities. These approaches and their outcomes are discussed in the paper.

Introduction

Forest degradation is a major problem for India, where forestry is the second largest land-use sector after agriculture. While about 275 million people in rural areas depend on forests either wholly or partially for their livelihoods, the majority of them living in forest fringes are among the poorest and most vulnerable groups in the society. Recognizing the role of forests in ensuring the environmental and economic stability of rural communities, the Government of India (GoI) enunciated the 1988 National Forest Policy that subsequently enabled the adoption of the Joint Forest Management (JFM) programme (GoI 1990). This policy change shifted the emphasis on the use of public forests from commercial exploitation to meeting the socio-economic needs of local people (Khare *et al.* 2000). JFM enabled meeting such needs by providing institutions for regulating access to, and promoting management of, state forests jointly by local community groups and state forest

departments. Thus the JFM programme is essentially an institutional mechanism to promote local people's participation in the sustainable use and management of forest resources.

The JFM approach represents a major paradigm shift in India, and has received considerable impetus from policy makers, foresters, and donor agencies in recent years. As of 2005, the area under JFM exceeded 27% of the national forest area across 27 states. With more than 85,000 Village Forest Councils (VFCs) established to manage forests at the community level, the JFM is recognized as one of the largest participatory forest management programmes in the world (Kumar 2002). Despite JFM's popularity as a practice with potential ecological and social benefits (TERI 1998; Datta & Varalakshmi 1999), concerns have, however, been expressed over the sustainability of this approach (Lele 2000; Sundar 2001). JFM's performance was also found to vary highly when applied in broader contexts and scales (Jeffery & Sundar 1999).

From local communities' point of view, three aspects particularly distinguish JFM from earlier management approaches. The first is the notion of ***community control*** – in other words, people living in the community are closely involved in deciding how the forest is managed. The second element is ***local benefit*** – that the benefits generated from the forest, be they economic or social, are mainly meant to benefit the local community. The JFM strategy in India is particularly built on the notion that local communities can help protect and regenerate forests if they are suitably compensated with resultant forest products. The third is of ***sustainable management*** – that the forests are managed to ensure their long-term ecological health and productivity and their ability to meet local people's socio-economic needs in the long run. These three aspects are in turn interrelated, as the benefits available to local communities are critical in ensuring their involvement in forest management and in sustaining JFM over the years.

In highly productive areas with a relatively low population, the needs and interests of villagers can be largely met through the forest products obtained from JFM, as was envisaged in the policy, and adequate returns to investment can be achieved. Operation of such a self-paying incentive mechanism could also be reasonably simple and sustainable. On the other hand, the involvement of local people and sustaining their interest in management is more complicated when the benefits are not as high, immediate, or widely distributed (Kerr 2002). This normally is the case when JFM is introduced to improve degraded forests such as those in Tamil Nadu. This limitation poses significant challenges in sustaining local people's interest in forest management. This predicament also requires designing innovative approaches to sustain the programme in villages.

The objective of this paper is to provide insights on potential institutional and financial strategies to promote participatory forest management. The observations are particularly relevant to situations where forest productivity is initially a major challenge to implementing JFM. An in-depth analysis of implementation of this policy in Tamil Nadu state in India provides the basis for the observations made in the paper. The findings of the study will also be useful in identifying appropriate institutional remedies to effectively implement JFM elsewhere in the country.

Forests and their significance in Tamil Nadu

Forests constitute 17.6% of the total geographical area of Tamil Nadu, compared to 23.4% for India as a whole. The per capita forest area in the state is a meagre 0.04 hectares, half

that of the national figure. In recent years, these forests have been exposed to further degradation. With an estimated 100,000 villagers entering the forests for various consumptive uses, and approximately one million cattle and other domestic animals grazing inside without restriction, the biotic pressure on these forests is immense. According to an estimate, about 0.7 million tonnes of fuelwood, 0.13 million tonnes of fodder and green manure, and 10,000 cubic meters of small timber are annually removed from the forests. As a result of these pressures alone, about 25,000 hectares are estimated to be in the process of degradation annually (TNFD 1997).

From an ecological point of view, however, these forests are of immense value to the state, which is located in a rain shadow region. The average annual rainfall is about 860 mm and droughts are common. Forests are located in critical catchments of the majority of the 32 river systems, 11 major reservoirs, and 38,863 small reservoirs. The dependence on groundwater resources for drinking and agricultural uses is one of the highest in the country. Barren land at the start of the rainy season results in reduced moisture infiltration, leading to lower groundwater tables, and even depriving people of drinking water in several places. In recent years, groundwater tables fell steeply and about half of the state was observed to be in a state of "absolute water scarcity" (TERI 1998) which was the highest in the country.

Implementing the Tamil Nadu afforestation project (TAP) with JFM

In the past, restoring degraded forests was mostly confined to raising block plantations with little public involvement. In order to augment forest production and reduce pressure on reserved forests, production forestry was eventually extended to community lands and private areas under Farm Forestry and Social Forestry schemes, and local people's involvement was achieved to a limited extent (Andersen 1995). These schemes however, paved the way for promoting forestry extension, agro forestry, and interactions with other government agencies in the forestry sector. Later, in the late 1980s, Interface Forestry was introduced with the aid of the Swedish International Development Agency. This programme particularly led to the establishment of Village Forest Committees with responsibilities for forest protection and rights over ensuing benefits (Sreedharan & Sarkar 1998). Thus, the Interface Forestry approach brought about a significant change in how problems relating to restoring degraded forests are addressed. The programme also made apparent the benefits of involving local communities in forest management. However, it could not be sustained in the long run, as the benefit flow to the participating villages was low (Annamalai 2003). A comprehensive approach was thus needed to address the root causes of degradation, i.e., poverty among forest fringe villagers that leads to their indiscriminate use of forests, and poor productivity of forests that cannot withstand such intensive use.

The current JFM strategy

JFM was initiated in Tamil Nadu in 1997 with the theme of "save the forests to save the water," as part of the $100 million Tamil Nadu Afforestation Project (TAP) under the Japanese Overseas Economic Co-operation Fund[17]. Of the 3,000 villages abutting the 7,000 km^2 of severely degraded forests (having a crown density of 0.4 or less, compared to a good quality forest area with a crown density of 1.0), JFM was initially introduced in about 1,000 villages.

[17] Earlier known as Japanese Bank for International Cooperation (JBIC).

The current JFM approach to restore degraded forests primarily focuses on two aspects: (i) enhancing the productivity of the resource base; and (ii) supporting the socio-economic improvement of forest fringe villages. While the former tries to address the supply side of the challenge by providing more forest produce and other tangible benefits from forests, the latter endeavours to reduce pressure on forests from villagers. Earnest efforts were made to improve the degraded forests in a systematic manner. These included prioritising forests on the basis of their degradation, identifying appropriate species and silvicultural treatments, and implementing the programme on a "micro-watershed basis," using advanced technologies such as GIS, application of bio-fertilizers, etc. Necessary soil and moisture conservation measures were also included in a comprehensive package to improve forest regeneration and surface and ground water levels. Over a period of approximately 8 years (1997-98 to 2004-05), Rs 4,261 million ($95 million[18]) or about 84% of the project funding was invested in afforestation and watershed improvement to restore 0.48 million hectares of degraded forests.

In view of the need to protect and maintain the restored forests, local management committees (VFCs) were constituted under JFM. The VFC was given authority over regulating access to forests, resolving intra-village conflicts, and ensuring equitable distribution of benefits. As an incentive to the participating villagers, like all other JFM initiatives in the country, the Tamil Nadu JFM provided usufruct rights over forest products to VFCs. All of the forest produce such as fuel, fodder, green manure, and non-timber forest products (NTFP) that could be harvested from the restored forests on a sustainable yield basis went to VFC members free of cost (with priority given to the poor and landless). The sale proceeds of any surplus produce sold are distributed equally among VFC members after remitting 25% of it to a specially constituted fund called the "Village Development Fund" (VDF) (GoTN 1997). During the above project period, 1,367 VFCs were formed with 465,588 villagers as members.

JFM outcomes

Several local and regional studies indicate significant positive impacts of JFM on the local ecology. Large-scale soil and moisture conservation activities have not only checked erosion and impounded water, but also revived many natural springs (Business Line 2000). With 23,454 checkdams and 2,201 percolation ponds constructed for water harvesting in various places, additional water storage capacity of about 22,653,477.3 m^3 was created in the state. In 20 of the sample watersheds, an increase of 3.8% to 14.2% in the groundwater table was recorded (Sreedharan 2002). Positive changes were also observed in cropping patterns and agricultural yields due to effective utilization of the increased moisture by farmers in several project areas (Neelakantan 2000).

Heavy investments made in forestry and water harvesting, and the protection of plantations achieved through the active involvement of villagers, were attributed with being the major reasons for this improved performance. The programme also generated about 60 million human-days of employment in the form of nursery and regeneration works in project villages. Further, the people's institutions led to substantial collective action in the villages resulting in strict forest protection. Significant reductions in the goat population, cattle grazing, wildfire occurrence, and forest encroachment were also recorded in JFM-implementing villages (TNFD 2002).

[18] $1=Rs. 45 approximately.

Strategies to sustain Joint Forest Management

As indicated above, the incentives available to VFCs for their participation in JFM are primarily the forest products and their sale proceeds. However, despite the resurgence of vegetation, the degraded forests have not yet been able to produce significant quantities of forest produce for harvesting by any of the VFCs in the state. The areas under JFM are characterized by very little topsoil, low nutrient availability, and severe soil compaction caused by decades of cattle movement. Also, forestry projects would take several years to yield substantial results. In the project period of 8 years (1997-98 to 2004-05), the communities harvested 2,526 metric tons of NTFP worth US$149,000, about Rs.14 or less than $0.33 per member (TNFD 2006).

If the present JFM was structured solely to sustain harvesting of forest products, it would have met with the same fate as earlier approaches. To avoid recurrence of such failures, systematic efforts have been made from the beginning to make JFM financially viable for villagers and to place the policy on firm ground. Some of these measures are in progress, and are evolving, in accordance with the changes that are occurring in the broader natural resource policy arena in India and elsewhere. These are described in detail below.

Status of registered societies according VFCs

In order to provide the VFCs with necessary legal status and certainty in their functioning, they are registered as societies under the Tamil Nadu Societies Registration Act, 1975. Implementing the programme in the form of societies provided the needed flexibility for raising funds and investment for asset creation and socio-economic development. This measure also allowed for effective community involvement and systematic benefit sharing. Besides facilitating innovation, the society mode permitted the incorporation of changes in response to emerging needs and experiences.

Provision of seed money to VFCs from the project

In view of the long gestation period involved in harvesting any substantial forest products out of JFM, the project provided Rs 300,000, Rs 200,000, and Rs 100,000 in the first, second, and third years respectively as seed money to the VDF. The VDF, maintained by the VFCs, is meant to serve as an incentive to the participating villagers. About 70% of the VDF is spent on individuals or small groups dependent on forests to help them develop alternative employment opportunities. The remaining 30% of the VDF is used for general development activities that benefit the village as a whole. These activities included laying village roads, providing drinking water facilities, construction of community halls, etc. These are undertaken to build necessary rapport between the forest department and villagers and also to instil confidence among villagers in the programme. About Rs. 840 million or 16% of the project money was spent on both individual and village-level development activities (as mentioned earlier, 84% of the project money was invested in afforestation and water harvesting).

In the absence of significant forest products, village development assistance proved to be a major attraction to the villagers. Compared to other areas in the state, the JFM villages historically lagged in several basic necessities. The introduction of JFM provided a major opportunity for local leaders to help remedy the situation. Several villages came forward to take up the task of forest protection, anticipating some developmental assistance. In a

random survey of select JFM villages, about half of the respondents said that obtaining more developmental benefits was their primary recommendation for improving JFM (Matta & Alavalapati 2006). Some entrepreneurial VFCs built community halls and other common facilities and rented them out to the public to ensure a steady supply of income, thereby making the programme sustainable. These instances indicate the kind of enthusiasm and interest this component has generated among local people in JFM.

Establishing self-help groups and promoting micro-credit

Capitalizing on the community-driven development approach, wherein the community members identify their own needs, design and plan interventions, and implement and monitor them in small, homogenous groups, about 3,891 self help groups (SHGs) were established in JFM project villages in the state. Similarly, extensive alternative employment opportunities were provided to forest dependent individuals after systematically identifying their needs and skills through PRA and RRA exercises. The main objective of these efforts has been to wean forest-dependent communities away from destructive forest use practices and to rehabilitate them with viable livelihood opportunities. As mentioned earlier, about 70% of the money meant for socio-economic development activities was spent on this component.

A key feature of this component is that the money available for supporting individuals or SHGs is constituted as a revolving fund and is invested on a micro-credit basis, i.e. the funds given to them by the VFCs need to be returned to the VFCs along with interest. Then the money is again advanced to other needy individuals or SHGs. Thus, the smooth rotation of this corpus fund among identified villagers forms the crux of the program and in turn determines its sustainability. About $12 million was invested in this micro-credit financing mechanism during the project period. In a similar participatory forest resource management programme implemented at the Kalakkad Mundanthurai Tiger Reserve (KMTR) in Southern Tamil Nadu, 182 local committees called Eco-Development Committees (EDCs) were formed to support biodiversity conservation. These EDCs have sustainably managed the initial seed money granted to them for individual and group assistance via this revolving finance mechanism. A detailed case study on how the micro financing helped these communities and supported the conservation efforts of KMTR is provided in the annex.

Observations made by the state forest department indicate a moderate level of success achieved in managing these funds in TAP by a majority of the VFCs. Compared to the Tiger Reserve project (Annex), TAP has just started, and more time is needed to see significant results.

Another key feature of this component is the pro-poor and pro-women emphasis in JFM implementation. In both the individual and SHG support activities, building skills and capacities of rural poor and women was given top priority. Women in rural areas are the major forest stakeholders, acutely dependent on forest resources such as fodder, fuelwood, and NTFP and forest-based employment round the year. They also have the reputation of being good custodians of family values and traditions in rural India. In recent years, they have proved to be skilful entrepreneurs and money managers. Hence they were given a prime place in micro-finance enterprise development, asset building, and skill improvement through special trainings and institutional linkages. At the end of the project period, there were 3,891 SHGs, with 60,097 women members trained in various income generating activities.

Enabling Inter-sectoral linkages and additional development investment

Interest in JFM in low productivity forest areas is diminished if the local people have other profitable land use options. This is particularly so in the context of current global market dynamics and associated pressures, which are bringing about fundamental changes in community characteristics, traditions, and livelihoods. These transitions greatly influence local people's needs, ability, vision, and willingness to work collectively for forest management – especially when the public good value of the effort is high and immediate benefit to local individuals is low. These observations highlight the need for alternative institutional approaches that go beyond the provision of forest products as incentives to villagers. As mentioned earlier, many JFM villages are located in interior areas and the central demands of these villagers were better government services and infrastructure. They range from simple needs such as getting ration cards to the laying of roads. In order to meet these demands, the forest department obtained special government orders to involve district level officials in JFM. A state level committee was also constituted to monitor and guide the implementation of this inter-sectoral integration policy for JFM.

Pursuant to this measure, many government agencies such as Rural Development, Social Welfare, Agriculture, and Transportation dovetailed part of their activities with JFM. In the past eight years of TAP implementation, an unprecedented $13.6 million has been invested in 1,113 project villages involving about 22 government departments. This works out to about $12,000 per JFM village. This is in addition to about $14,000 directly invested by the forest department. Further, the Tamil Nadu Adi Dravidar Housing and Development Corporation Limited (TAHDCO) promised $0.22 million investment in rural areas abutting forests for poverty alleviation and reduction of forest dependency. The department is also working on getting funds for the above activities under the Tsunami Reconstruction project and Pudu Valzhvu (a World Bank-supported poverty alleviation programme implemented by the Tamil Nadu state government).

Encouraging corporate investment in forestry

Public-Private partnership is gradually emerging as a strong force to augment investment opportunities in forestry and environment sectors. One such notable example is the TVS Group of Industries joining hands with the state forest department to reforest some of the degraded forest areas in the state through VFCs. The TVS Group, a flagship automobile enterprise in the state, has made significant contributions to JFM through its social services wing (Srinivasan Services Trust) in Vellore and Tiruvannamalai districts (TERI 2002) and intends to adopt 50 more VFCs. Similarly, M/s. India Potash Limited, another corporate body, has proposed to invest in the production of Jatropha, a bio fuel species, in degraded areas through the JFM mechanism. In addition, plans are afoot to obtain funding from the National Bank for Rural Development (NABARD) to support investment in forestry in rural areas. At the local level, JFM villages also have links with local commercial banks and other professional development institutions.

Extending TAP and integrating JFM with other forestry projects

Since omitting certain degraded forest areas has serious consequences for the overall sustainability of the program, efforts were also taken to expand the area under TAP and to integrate it with other forestry programmes. The need for extending development assistance to VFCs beyond 3 years as a way of sustaining JFM was also suggested by Somasundaram and Sreedharan (2003). One of the consequences of implementing JFM in a few villages is

that the cattle from JFM villages move to nearby non-JFM areas. This will accelerate forest degradation there and also lead to increased conflicts among JFM and non-JFM villagers. To minimize such instances, TAP was extended to 1,367 villages in the first phase with a total investment of US$150 million. To consolidate the gains made in this phase and to cover additional areas, Phase II of TAP was also launched in the state. This second phase is intended to cover about 800 villages with a budget of US$120 million over a period of 8 years beginning in 2005 (TNFD 2006). The major focus of this phase is to build capacity and improve the livelihood opportunities of forest stakeholders.

The National Afforestation Programme (NAP), a programme of the GoI, commenced in 2002 and involves local communities in forest protection and conservation through Joint Forest Management Committees. It is also being implemented in tandem with TAP in the state to ensure maximum synergy between these two programmes. Currently the NAP covers about 1,140 villages to improve about 53,000 hectares of forest area with an outlay of US$20 million.

Exploring opportunities for environmental service payments

Forest restoration and improvement also provide broader environmental benefits such as climate regulation and watershed protection. Local communities participating in JFM could receive incentives for provision of these services and thereby potentially enhance the financial viability of their functioning (Matta & Kerr 2006). Such benefits of JFM in Tamil Nadu come in several forms and have effects at local, national and international levels. At the international level, forest conservation and regeneration sequesters carbon and helps to stabilize the global climate (Verweij 2001). At the regional level, the JFM areas in Tamil Nadu are critical catchments for major rivers, reservoirs, and irrigation tanks (TNFD 2003). It is well known that improved vegetation cover stabilizes soil and increases the infiltration of water into the ground, thus increasing soil moisture and reducing siltation of downstream water bodies. In addition, the forests of Tamil Nadu, particularly those dotting the Western Ghats, are home to significant biodiversity (Menon & Bawa 1997). At the local level, the soil and water conservation activities undertaken have improved agriculture.

Payments for environmental services programs, which are new in India, are also gaining momentum elsewhere in the world. In Costa Rica, for example, upstream landowners receive payments for watershed protection and carbon sequestration, with a national agency working as an intermediary to reduce transaction costs (Pagiola *et al.* 2002). In Ecuador, downstream municipal water utilities pay upstream forest communities to protect the water supply (Echevarria 2004). Developing institutional arrangements to receive such funding for provision of environmental services by local communities is in need of continuous innovation (Pagiola *et al*. 2002). The state forest department has set up a special unit to develop comprehensive proposals to access the carbon market so that additional money is available to JFM communities.

Training, capacity building, and imparting attitudinal change

The JFM policy will be sustainable in the long run only if the skills, capabilities and attitudes of all those required to implement it are also simultaneously transformed to suit the adjusted work conditions (Matta *et al.* 2005). In other words, there should be a “shared understanding” of the principles and approaches of JFM held by all stakeholders to make this policy work in the field. Heavy investments in forestry, large-scale watershed development, and increased involvement of stakeholders, all require the acquisition of new

tools, techniques, skills, and procedures. In addition, the new situation requires staff to engage in a host of social activities such as awareness creation, negotiation, coalition building, and conflict resolution. Hence, to make the program sustainable, appropriate training, capacity building and attitudinal change measures were undertaken for forest staff, villagers, community leaders, non-governmental organizations and other development functionaries.

Discussion and conclusions

Since Hardin's article on the "Tragedy of the Commons" (Hardin 1968), the role of *effective institutions* in regulating the use and management of natural resources for their viable stewardship has received vital prominence (Ostrom 1990). An innovative measure taken up by the GoI in this direction is the launching of JFM to involve local village stakeholders in forest management through Village Forest Committees. Current literature indicates that the JFM approach has halted forest degradation of to a considerable extent (Kumar 2002). The problem, however, seems to be in ensuring the programme's sustainability in the absence of some immediate and tangible benefits to local people. This is particularly challenging when JFM is implemented to improve degraded forests.

In this paper we discussed some of the institutional and financial approaches that could potentially help improve the sustainability of JFM based on an in-depth study of this programme in Tamil Nadu. These approaches focus on: (i) stronger rights and responsibilities for local forest management; (ii) effective institutional measures targeted toward rural poor and women; (iii) improved sectoral integration and flow of developmental aid; and (iv) flexible and more effective organizations.

These are being implemented under the presumption that forest improvement offers good potential for poverty reduction and rural economic growth while simultaneously meeting critical national conservation goals. JFM experiences elsewhere indicate that on-site, tangible benefits of afforestation could be realized in as few as 20 years. For example, in Sukhomajri, India, the initial impetus for investment was saving Sukhna Lake downstream of the city Chandigarh through afforestation, and soil and moisture conservation. However, due to high on-site benefits of these efforts, Sukhomajri was transformed from a very poor village to a rich one. In this small village of about 1,000 people, milk sales reached about US$8,000/yr, bhabbar grass fetched about US$3,000/yr, crop yields improved and the economy diversified. Tree density rose approximately 100-fold over twenty years with an estimated annual potential yield worth US$700,000 (Agarwal 1999) through their harvesting. Sukhomajri is perhaps a unique case and such high benefits cannot be expected everywhere. But this case illustrates the financial potential of a sound forestry enterprise. The experiences of eco-development projects in India (Pandey & Wells 1997; Chopra 1998) and elsewhere (see Brown *et al*. 2002) suggest that provision of development incentives to local people to ensure their interest in forestry while the forest is recuperating could be a viable venture.

While there are always some hurdles in using development interventions as incentives for conservation, it would be possible to make this mechanism work if the payments are made contingent upon conservation performance shown by villagers. It is this "conservation contracting" approach (Ferraro 2001) that ultimately leads to vesting considerable responsibility in the hands of local communities. Simultaneously, formation of SHGs, strengthening micro-credit and income generation, and ensuring women's empowerment

would lend necessary strength and capacity to these local institutions to manage forests effectively. The ideas presented in this paper offer new ideas in sustaining local resource management through JFM in India.

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ANNEX

Case study on sustainable forest management through microfinancing: Kalakkad Mundanthurai Tiger Reserve (KMTR) Eco-Development Project

The concept of microfinance - empowering the poor by enabling them to save and gain access to credit - has been extended to sustainable forest management in forest fringe areas and biodiversity conservation in developing countries, since a majority of forest dependents also happen to be poor. To escape from their misery, often these people indulge in destructive and unsustainable practices that cause severe damage to the local forests. Some of these practices include indiscriminate collection of fuel, fodder, and green manure, setting fire to induce fresh growth of grass for grazing, and wildlife poaching. In order to minimize these people's unsustainable practices from forests and offer them viable alternative employment, most forestry projects undertake microfinancing. Microfinancing basically involves lending to the poor at low interest rates. These are illiterate people with no collateral to offer, and therefore, cannot normally get loans from banks. We present below the case of Kalakkad Mundanthurai Tiger Reserve (KMTR), where this concept has been successfully implemented to conserve the Reserve's unique biodiversity.

The **Kalakkad-Mundanthurai Tiger Reserve (KMTR)** in Tirunelveli district is the first Tiger Reserve in Tamil Nadu. Located in Western Ghats, a global biodiversity hotspot, KMTR is the southernmost tiger habitat in the country. The unique edaphic and climatic features of the Reserve led to rich faunal and floral biodiversity, including 32 flora and 17 fauna species designated as highly endangered. Part of the Agasthyamalai hills in the core of the Reserve is considered to be one of the five centres of plant diversity and endemism in India. In addition, the KMTR forests also form the catchment for about 14 major rivers and streams and six reservoirs that are critical to local agriculture and water supply.

However, like many wildlife areas, the KMTR is subject to severe anthropogenic pressures such as cattle grazing and forest produce collection. It was under these circumstances that a World Bank-assisted Eco-Development Project was initiated in 1996. The major objective of the Project is to reduce the dependency of the people living along the boundary of the Reserve through promoting conservation education and alternative employment generation. Under this Project, 182 local committees, called Eco-Development Committees (EDCs), were formed to support biodiversity conservation.

An analysis of the project performance indicates that it has brought about a drastic change in the lives of the villagers and significantly improved their livelihood security. More than 2,000 woodcutters who were dependent on KMTR forests earlier were provided alternative livelihood opportunities. Grazing was also reduced by more than 50%. The project also converted erstwhile hostilities between Forest Department and local people into a collaborative relationship, promoted people's involvement in biodiversity conservation, and substantially improved the local economy. One of the reasons for this astounding success was the adoption of the microfinancing approach by the Eco-Development Project. In particular, a high percentage of loan recovery enabled the EDCs to provide financial assistance to additional forest dependents and manage the corpus fund on a revolving basis. In order to get unbiased information on the working of this approach, of the 182 EDCs where the project is being implemented, 10 EDCs were selected through systematic random sampling.

About Rs.3,287,000 were made available by the project to 3,236 EDC members, which comes to about Rs.1,000 per member. As of now, 1,182 members have benefited through microfinancing. The average amount advanced to a beneficiary is about Rs. 3000, although this figure ranges between Rs.500 to Rs.20,000, depending upon the nature of activity for which the money is advanced. A 12% rate of interest was charged on the loans and the recovery percentage ranged between 86% and 99%. In a period of about 7 years, the total amount advanced by the project grew from Rs.3,287,000 to Rs.4,210,000. The activities for which the credit is advanced include agriculture, dairying, tailoring, and establishment of small businesses such as vegetable and fruit vending. Most of the beneficiaries have moved away from destructive forest practices to viable alternative livelihood opportunities.

The following are some of the factors responsible for successful implementation of the micro-financing approach:

1) Formation of Self-help Groups or SHGs: To ensure that these small loans are promptly repaid, money is lent to groups, often women, who appear to respond better to financial terms. About a dozen members guarantee each other's loans and a default by one could result in the entire group being penalised. The SHGs work on simple, locally enforceable rules, meticulous organization, and peer pressure among borrowers. In particular, the peer pressure ensures repayment rates over 95%.
2) Extending loans to activities with well-defined market segments: The microfinancing works if the lender is able to identify viable businesses that just need a little financial assistance to get started, to expand or meet a temporary need. Activities such as dairying and vegetable vending have a well defined demand in the local market. Field observations reveal that the local women dependent on forests are very industrious, but are unable to take full advantage of their skills for want of capital. They were especially empowered by the eco-development project by providing them access to small loans.
3) Use of local resources and traditional skills: The focus of micro-credit support was on promoting occupations that use local resources and traditional skills. Simple businesses such as laundry, tailoring, and making ethnic food products resulted in viable trade. Other opportunities based on traditional skills include palmyra products, basket and broomstick making, woodcarving, handicrafts, and terracotta figure making. Occupations based on local resources include vermi-composting, herb and medicinal plant collection, tamarind collection and processing, rope making, small-scale fishery, and fish processing.
4) Extending technical support through project authorities and non-governmental organizations (NGOs): The project authorities as well as enthusiastic local NGOs provided technical support for establishment of businesses, product processing, market information gathering, and marketing on several occasions. The critical aspect to be decided here is the choice of “appropriate” technology. This often depends upon the ability of the borrower to manage the complexity involved in the supply chain.
5) Treating the money lent as capital: Another important principle that needs to be meticulously followed for the success of microfinancing approach is inculcating in the minds of borrowers that the money lent is capital and not a grant or subsidy. Often, this distinction makes all the difference in how the money is used. Grants and subsidies mask the harsh realities of a business venture, and when the money flow is over, the businesses also vanish. Hence, to extract true potential and investment on the part of the borrower, it is essential to make them treat the money given as capital.

Now, with the experience gained at KMTR, efforts are being taken to extend the micro-financing approach to other forest areas in the state where forest dependence and alternative livelihood provision are two major challenges.

5 Experiences of financing sustainable use and conservation of forests in South Korea

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Abstract

This paper provides an overview of the trends in forestry financing in South Korea. The financial mechanisms for public investment in the use and conservation of forest resources in South Korea are described. Some specific examples such as direct investment, lump sum payment to forest-dependent peoples, loans and subsidies, and tax breaks for private forest owners are discussed. The experiences of South Korea in financing forest management are critically discussed in order to draw lessons, which can guide future policy on public investment in the forestry sector.

Introduction

The Republic of Korea (hereafter South Korea) has experienced a successful transition to sustainable management of its forests by restoring forest ecosystems that were once severely degraded due to over-exploitation. South Korea's extensive forest restoration has been realized through not only human resource development, but also through strong financial support from the private and public sectors.

Two thirds of forestland in South Korea is in the hands of the private sector, mostly individuals, while only 29% is publicly owned. Therefore, the role of the private sector in forest resource management in South Korea is vital. However, the opportunity costs of not converting forest to other land uses such as agriculture and urban development is high in most cases. In order to ensure food security and social integrity, the government has adopted trade policies to protect the domestic agricultural industry.

Until recently, the objective of forest conservation had been watershed protection and production of organic fertilizer to support agriculture. As income levels increased, however,

the demand for recreational facilities such as golf courses and ski resorts have risen. Many recreational facilities have been developed by converting forestland. With such a high opportunity cost of keeping forestland, sustaining forestry requires financial support from the public sector. This paper describes the four key mechanisms for financing the sustainable use and conservation of forest resources in South Korea: subsidies, taxes, income transfer, and direct investment in forestry by the public sector.

The government recently initiated a performance evaluation program. Every publicly financed program must be evaluated annually and the allocation of the subsequent national Government budgets are linked to performance. The criteria for evaluating publicly financed programs have been developed and are being applied to evaluate public forestry financing in South Korea. The criteria and some examples of their applications are presented in this paper.

Forestry investment in South Korea

Severe droughts and floods, partly caused by the degradation of forests, have been a major concern in South Korea, particularly up to the 1970s. In response, the government made restoration of denuded mountains the first priority in mitigating the impacts of natural disasters on people's lives and livelihoods. The South Korean Government set a national greening goal by launching the First National Rehabilitation Plan in 1973. Most of the National Government's budget for forestry was allocated to forest restoration. The First Rehabilitation Plan was originally intended to be implemented over a 10-year period, but it ended in the sixth year when its goals were successfully reached. The Government's financial commitment was the most important factor in the early achievement of the goals. The Plan also marked the beginning of significant public investment in forestry. The government's investment was extended to the Second Phase of the National Rehabilitation Plan (1978-1987). The total investment for the First and Second Rehabilitation Plans reached 592 billion Korean won (US$629,787,234) and captured more than 1% of the total national budget. This success in securing financing provided the basis for sustainable forest management in Korea in the following years.

A new plan, the Forest Resource Establishment Plan was launched in 1988 just after the completion of the First and Second Phases of the National Rehabilitation Project. The new plan sought to improve the profitability of forestry, and its main objective was to establish the basis for sustainable forest management. However, the plan did not receive the required level of financial support from the government, possibly due to the belief among political leaders that the greening goals had already been accomplished. The government's budget for forestry could not meet the costs for managing young trees planted over the last two decades. As a result, much of the rehabilitated forests were left unmanaged, although they required intensive management in order ensure successful development of productive forests.

The investment environment for the forest sector began to recover in the mid 1990s when awareness and demand for various services provided by forests increased and the principle of multiple-use forests was incorporated into forest policy. The Third National Forest Plan (1988-1997) adopted the multiple-use forestry framework as its main paradigm. With the modification of the forest policy to accommodate changing social demands, the national budget for forestry rebounded in the mid 1990s from the slump of the 1980s. Expenditures

in forestry have made up over 0.5% of the total national budget since then. The forestry sector budget grew to 880 billion won (US$936,170,212) in 2005 (Table 1).

Table 1. Trend of National Budget for Forestry in South Korea

	1973	1975	1980	1985	1990	1995	2000	2005
Forestry budget	10	19	44	57	148	372	734	880
National budget	997	1,853	8,814	15,050	32,537	72,915	123,916	159,434
Share of forestry budget (%)	1	1.03	0.5	0.38	0.45	0.51	0.59	0.51

Source: Korea Forest Service *Unit: Billion Korean Won (US$1 = KRW 940)*

The national budget allocated for forestry in recent years can be grouped into five major categories. These are, in declining order of budget allocation: forest resource base enlargement, national forest enlargement, building sustainable forest management infrastructure (such as forest roads), forest protection, and provision of recreation services and environmental protection. It is notable that the budget for sustainable forest management infrastructure received the largest funding allocation in the early 2000s, indicating that it became the major forestry goal in those years. In recent years, funding for forest protection has increased significantly, 13% per year, followed by provision of recreation services and environmental protection.

The shift in budget allocation in the forestry investment portfolio in recent years reflects a changing forest policy environment in South Korea (Table 2). The returns from investment in forestry infrastructure development are not high due to the rising costs of timber production. Provision of recreational services for the public has become more important due to economic development and increased leisure activities after South Korea's adoption of the five-day work week. Also, an increase in the incidence of forest fires and pest outbreaks has caused severe forest damage and made forest protection more important than previously.

Table 2. Recent trend of forestry budget allocation in South Korea

Classification	2001	2002	2003	2004	2005	Growth rate (% yr^{-1})
Forest resource base enlargement	2,153	1,998	1,806	1885	2,167	0.2
Forest protection	923	1,202	1,300	1,437	1,548	13.8
Building sustainable forest management infrastructure	1,917	2,201	2,285	2,140	1,919	0
Provision of recreation and environmental services	614	571	741	766	913	10.4
National forest enlargement	1,531	1,428	1,544	1,973	2,248	10.1
Total	7,138	7,400	7,676	8,171	8,795	5.4

Source: Korea Forest Service *Unit: 100 million Won*

Financial mechanisms for sustainable use and conservation of forests in South Korea

There are two sources of forestry investment in South Korea – private and public funds. Private funds are comprised of the individual savings of forest owners, while public funds are derived from taxes and sales of state-owned forestlands and products thereof. Forest owners have made investments in forestry, producing products and providing environmental services, using a combination of private and public funds. Kim (1992) reported that less than half of forest owners have made private investment in forestry and only a small portion are interested in timber production. Therefore, strong financial support from the government has been critical in ensuring adequate forest financing in South Korea.

Government funding in forestry has been delivered in two ways – direct investment and subsidies. Direct investment in forestry has been made via national forest management and provision of technical support and information for private forest owners. Ten percent of the national forestry budget is being allocated to enlarging national forestlands, which are managed mainly for the provision of public goods such as biodiversity conservation and recreational services (see Table 2).

Subsidies and tax breaks have played a more important role in public financing of forests in South Korea. In particular, subsidies for the management of privately-owned forests have been the key mechanism for financing the sustainable use of forest resources in South Korea, where private forests occupy about 70% of total forestlands. The details of subsidies for various forestry activities are summarized in Table 3.

Even though forestry activities by private individuals are strongly subsidized by the government, promoting sound forest management on private lands is still problematic due to low timber prices. Local authorities, in charge of overseeing private forests, establish annual forest management plans for their regions. Authorities entrust forestry cooperatives or forest corporations to implement planned forestry activities with the agreement of forest owners.

Table 3. Subsidies for main forestry investment projects in South Korea

Project	Subsidy rate
Establishment of Forestry Machine Center	a. 100%
Forest management planning	a. 50% b. 50%
Erosion control	a. 70% b. 30%
Building roads to control forest fire	a. 80% b. 20%
Forestry extension service	a. 100%
Planting:	
- Economic tree planting	a. 70% b. 20% c. 10%
- Watershed reserve forests	a. 70% b. 30%
- Tree planting for public good	a. 50% b. 50%
- Kum-gang pine tree	a. 70% b. 30%
- Sustainable production forests	a. 70% b. 30%
- Village forests for beautification	a. 50% b. 50%
Thinning and under brushing	a. 50% b. 40% c. 10%
Production of seedlings	a. 50% b. 50%
- Fertilizers for nursery	a. 100%

Establishment of forest recreation facilities	a. 50% b. 50%
Establishment of urban forests Planting of street trees	a. 50% b. 50% a. 30% b. 70%
Establishment of ecological forests	a. 50% b. 50%
Forest roads construction	a. 80% b. 10% c. 10%

Notes : a. central government; b. local authorities; c. percentage borne by forest owners

Forest owners can take advantage of tax breaks when investing in sustainable forest management. However, these tax breaks have been applied to plantation forests, and not natural forests. This is an issue for further consideration since natural forests provide more environmental and ecological services for the benefit of the public than do plantations. Table 4 summarizes the content of tax breaks for sustainable use and conservation of forests in South Korea. Forest incomes are reported differently from ordinary incomes, and inheritance taxes on forest holdings are eligible for discounts given the long-term nature of the forestry business and the provision of public goods as byproduct.

Table 4. Tax breaks for sustainable forest use and conservation in South Korea

Classification	Description
Income tax	50% reduction on income tax from forest harvesting (natural or planted) conducted in accordance with the forest management plan
Capital gain tax	Special deduction for forestlands with long-term ownership
Value added tax	VAT exemption for 15 types of forestry machines and equipments
Inheritance tax	Tax deduction when inheriting planted forests more than 5 years old
Gift tax	Tax exemption for receiving as a gift planted forests older than 5 years and less than 297 thousand m^2
Acquisition and registration tax	Taxes are waived if forestland is acquired for the purpose of forest production
Aggregated land tax	Temple forests, nature reserves, protection forests, seed orchard, and experimental forests are exempted

Nearly ten percent of forestlands are strictly protected under the designations of national parks, ecosystem preservation areas, green belts in urban areas, watershed conservation areas, etc. The government reduces or exempts taxes on all of these protected forestlands.

In May 2005, a new form of forestry financing was developed. The Korea Forest Service and K-water (Korea Water Resources Corporation) signed an agreement to collaborate on managing forests for watershed protection. K-water's interest is in supplying clean water. The company sponsors various forest management activities in the upper watershed areas. Awareness of the public benefits provided by forests is growing among the general public. In April 2006, President Roh instructed the cabinet to draft policies on payment for forest environmental services. Therefore, some forms of financing mechanisms for sustainable forest management are expected to be developed in the near future.

Performance of forestry investment in South Korea

As noted above, forest investment in South Korea over the last three decades has been dominated by public funds, even though 70 percent of forestlands are in private hands. Society's views on and expectations of forests have shaped forest policy and directed the goals of forest investment. Rehabilitation of denuded forestlands was the major objective of public demand-driven forest management in the 1970s and 1980s. The goal of public investment in forestry has since changed. In the late 1980s and mid 1990s, more public funds were directed to establishing a forestry infrastructure. Since the mid 1990s, investment for the provision of public goods such as biodiversity and recreational services has received greater emphasis.

There are no straightforward ways to evaluate the performance of forestry investment due to changing forest policy objectives. Here, we adopt simple criteria for the purpose of evaluating the performance of public forestry financing:

- Amount of forest resources;
- Productive capacity of the forestry sector;
- Amount of non-productive forest services used by people; and
- Health of the forest ecosystem.

The early stages of South Korean forest policy focused on rehabilitating deforested mountains – it turned out to be a significant success. The reforestation policy and related projects were successfully implemented through appropriate policy and the generous budget allocation. The re-greening projects in the uplands throughout the country were recognized as among the most successful in the world by specialized agencies such as FAO. Under the National Rehabilitation Projects (1973-1978, 1979-1987), two million hectares of forest were planted, covering one-third of the total mountain area. This project owes its success to a massive campaign that requested people to participate in tree planting and the allocation of adequate financial resources. The authoritarian government at the time allocated compulsory planting targets to government agencies, local authorities and schools. During this period, efforts to halt further deforestation were made by strengthening forest protection programs, preventing slash and burn cultivation, and changing household heating systems in the countryside from fuelwood to fossil fuel.

Timber stocks for the entire country increased from 74 million m^3 in 1973 to 201 million m^3 by 1987, at the completion of the forest rehabilitation project. In the following years, the forest growing stock jumped from 216 million m^3 in 1988 to 489 million m^3 in 2004, mainly due to increases in public forest financing and land owners' active participation in forestry activities such as the planting of fast-growing species (See Table 5).

Table 5. Forest area and growing stock in South Korea

	1973	1975	1980	1985	1990	1995	2000	2004
Forest area (1,000 ha)	6,566	6,568	6,543	6,512	6,460	6,452	6,422	6,400
Growing stock (1,000 m^3)	74,466	105,352	145,694	179,381	248,426	308,823	407,576	489,061
Growing stock per ha (m^3/ha)	11.34	16.02	22.18	27.47	38.36	47.87	63.46	76.41

Source: Statistical Yearbook of Forestry (2005)

The basis for efficient forest management has been established over the last two decades. A large amount of public funds were allocated for developing forest roads to improve the financial viability of forest production, provide social infrastructure for rural villages and improve forest fire prevention. The forest road network extended from 915 km in 1999 to 2,095 km in 2004. During the period from 1998 to 2007, forest policy initially focused on utilizing forest resources, but eventually shifted its aim to enhancing social services and balancing the use and conservation of forest resources.

The main management practice for enlarging the forest resource base has been the thinning of plantation forests that were established in the 1970s and 1980s. About 1,745,000 hectares of forests were thinned in 2004; a dramatic increase from 284,000 hectares in 1999. The cost of thinning of private forests is heavily subsidized (Table 3). The evaluation of the project's performance has yet to be conducted.

Timber demand is growing in the country, but the domestic supply of timber is not sufficient. Production costs are higher than the price of imported timber because of the high rural wages. However, domestic timber production is expected to grow due to increasing timber stocks and the outlook for the domestic timber supply is positive.

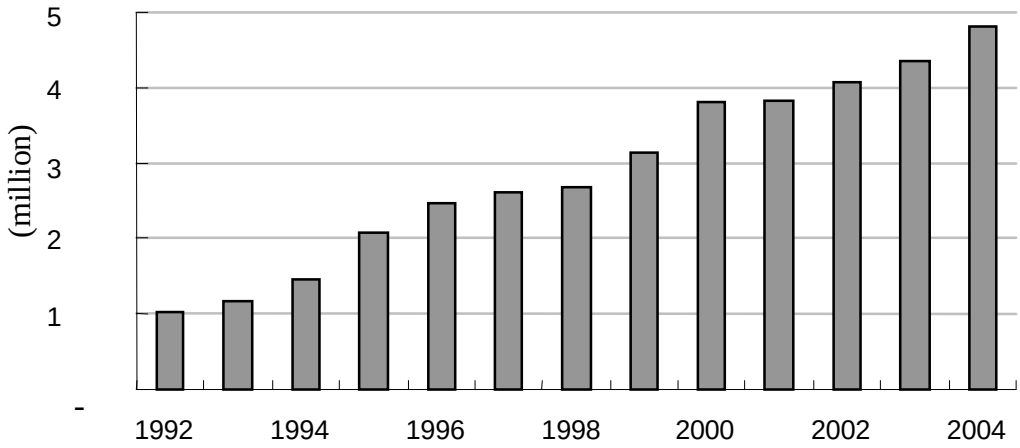
Table 6. Outlook of timber demand and supply

	1998	2002	2007	2020	2040	2050
Timber demand (1000m^3)	20,081	29,047	30,848	35,886	46,135	49,526
Domestic timber supply (1000m^3)	1,428	1,605	1,907	4,635	9,486	12,754
Self-sufficiency (%)	7.1	5.5	6.5	13.1	23.4	30.3
Sustainability index*	0.11	0.12	0.14	0.3	0.54	0.69

** Sustainability index is calculated by dividing actual harvests by sustained yield*
Source: Government of South Korea

The number of visitors to forested areas has increased substantially in South Korea over the last three decades (Figure 1). Youn and Youn (1996) found a positive correlation between the demand for forest recreation, income and the availability of leisure time. The demand for recreational use of forests is expected to increase further in the coming years. The number of visitors and their level of satisfaction can be used to evaluate the performance of public investment in improving the recreational value of forests.

Figure 1. Number of visitors to recreational forests in South Korea



The performance of public forestry financing in South Korea has been considered excellent. However, some aspects have been criticized for their ineffectiveness. Among them, two criticisms are notable. The first issue relates to the health of the forest ecosystem. Plantation forests dominated by coniferous trees are under serious threat from forest fires during the dry season. Also, an increased incidence of forest insect and disease outbreaks has raised public concern. Though forest health was not considered to be an important social issue during the early stages of forest rehabilitation and resource enlargement, it has now emerged as a major concern in sustainable forest management.

Since the reforestation and rehabilitation efforts were driven by the government as an emergency measure, not enough consideration was given to the species selection. In fact, the planted species turned out to be unsuitable for commercial and even recreational purposes in today's context. Some exotic species such as black locust (*Pseudo-acacia robinia*) and pitch pine (*Pinus rigida*) are considered threats to the native forest ecosystem and useless as timber resources. In recent years, the government has started to give more attention to natural forest management and replacing exotic species with native tree species.

Another criticism regards the efficiency of forest investment in achieving its objectives, which has never been evaluated to date. However, the current government has implemented a new policy of making budget allocations according to the performance of the various government agencies. And the Korea Forest Service has developed a set of criteria for evaluating the performance of each and every project financed by the government. We can therefore expect to see the results of the evaluation of government forestry investment in the near future.

Conclusions

Devastated forestlands in South Korea were successfully rehabilitated, mainly through the provision of public financing for forestry investment on private lands. The financing mechanisms for the sustainable use and conservation of forests has been biased toward public intervention in the form of direct investment and subsidies to private forest owners, in addition to tax breaks and direct income transfer.

Setting aside the issue of efficiency, the large public investment has achieved its goals in establishing the basis for sustainable forest management in South Korea. Such direct intervention by the government may lead to inefficiency unless there are well-coordinated efforts to monitor the effective delivery of goods and services that the programs are intended to provide. We consider that the introduction of market-based mechanisms (such as trading of carbon credits) that allocate public funds to projects providing socially valued products and services could improve the efficiency of forestry investment. It is expected that the government initiative to evaluate the performance of government-financed projects would lead to the creation of such market mechanisms in the near future.

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6 Public and private sector financing SFM in Malaysia: an investigation of existing and possible future mechanisms

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Abstract

Financing sustainable forest management continues to be an important element in national and international dialogues on forests. Adequate funding is crucial for implementing sound forest management. An important component of any national forest programme is its financial strategy to identify the most appropriate mechanisms, traditional and innovative, to fund the implementation of policies proposed. Malaysia can be regarded as one of the few countries in the tropics where forest management is actively applied. Indeed, Malaysia has been recognized as having some of the best formulated policies and legislation to manage forest resources sustainably. Policies and legislation alone are insufficient to ensure sustainable forest management in the country. It should follow with active implementation. Implementation of sustainable forest management in the country requires considerable financial investment. It was estimated that Peninsular Malaysia alone would require RM1.7 billion to fully implement Malaysian Criteria & Indicators, 64% more than what it currently spends on management. Strong government support, a clear financial strategy and appropriate mechanisms to fund the implementation of sustainable forest management in the country are among the reasons for achieving some degree of success. This paper highlights the forest resource status, including current policies and legislation in the country. The paper also reports on an investigation into existing mechanisms for financing SFM in the country by both the private and public sectors. Several case studies on SFM joint projects are also highlighted. Finally, future possible mechanisms such as the Clean Development Mechanism (CDM), Payment for Environmental Services (PES) and other forms of ODA and Joint Implementation (JI) are also discussed.

Introduction

Malaysia is committed to managing its forests in a sustainable manner and that includes economic growth and maintenance of environmental stability and ecological balance. To achieve this, Malaysia has set a target of maintaining more than 18.9 million hectares, or 50% of the land mass, under natural forest cover. Out of this, a total of 14.1 million hectares of natural forest have been designated as Permanent Forest Estate (PFE), which will be permanently managed to ensure that balance among various objectives such as production, protection, social and educational is achieved. In addition 3.39 million hectares have been allocated for protection forests in the form of national parks, wildlife sanctuaries and nature reserves. In addition to its natural forest base, Malaysia has also established a total of 0.17 million hectares of forest plantation, as well as 4.8 million hectares of agricultural tree cropland. These forest and tree crop plantations play an integral part in sustainable forest management; they provide an additional source of timber and fiber materials, thereby reducing pressure on the natural forests. Taking these plantations into consideration, the total area under tree cover in Malaysia is estimated to be 23.86 million hectares (72.6% of its land area) (Dahlan & Azmi 2006).

Malaysia continues to strongly support international efforts to promote and ensure sustainability in forest management. However, if the global community wishes to halt deforestation and improve forest management and conserve biodiversity, it should be willing to share the cost entailed. Some additional US$125 billion a year is estimated to be required to achieve the necessary improvements in forestry management practices worldwide. Since UNCED in 1992, the additional resources pledged by the developed nations to assist developing countries in this field are still not forthcoming. Presently tropical forests are undervalued. The international community which purports to value tropical forests for their biodiversity and as carbon sinks is still unprepared to pay for these services. In Peninsular Malaysia alone the estimated cost of implementing sustainable forest management is about RM1.7 billion, which will, in the case of Malaysia, be financed largely through royalties and levies imposed on forestry products. A study by ITTO indicated that to fully implement the Malaysian Criteria & Indicators, it would cost 64% more than that using conventional practices (Abdul Rahim 2002).

Good policies and legislation alone are insufficient to ensure sustainable forest management in the country. Implementation of sustainable forest management is also not cheap. This paper highlights the forest resource status, current policies and legislation, and reports on an investigation into existing mechanisms for financing SFM in the country by both private and public sectors. Several case studies on SFM joint projects are also included. Finally, future possible mechanisms such as the Clean Development Mechanism (CDM), Payment for Environmental Services (PES), and other forms of ODA and Joint Implementation (JI) are also discussed.

Development of sustainable forest management in Malaysia

Since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, in June 1992, forestry issues have been very much in the forefront of international debate on global economic and environmental issues. In this context, global deforestation and related problems such as environmental degradation and biodiversity loss are now seen as issues that require global remedial efforts that transcend national boundaries. Thus, the management of forests, which was once the domain of sovereign states and private individuals, has now become a global concern and been placed under

close international scrutiny. The principle of sustainable forest management has thus been imposed as conditionality before a country's timber and other forest products can enter certain segments of the international market, particularly those in the North. As a result, Malaysia, like other tropical timber producing countries will have to fulfill this conditionality in order for their timber to be accepted in such markets. Sustainable management of forests must, therefore, be evaluated in a more balanced view. It must balance the economic needs of developing countries with conservation and environmental considerations.

Since the turn of the twentieth century, Malaysia has evolved a systematic and sustainable yield policy with regards to the management of its forests with the establishment of the Forestry Department in 1901. Over the years, ecologically and environmentally-sound forest conservation and management policies have been developed to ensure that the forest resources in the country are managed for sustainable yield of timber and non-timber products, the enhancement of climatic stability and ecological balance, as well as the safeguarding of water resources and the conservation of biodiversity. This is evident in the various legislations promulgated over the years to strengthen institutions as well as for the management and utilization of forests. Thus, a strong institutional framework has been established between the State Governments (under which forest jurisdiction lies) and the Federal Government (responsible for national policy of the country). In this regard, the National Forestry Council (NFC) was established in December 1971, comprised of the Chief Ministers of the thirteen states and chaired by the Deputy Prime Minister. The NFC provides a vital forum for the formulation of forestry policies which are coordinated and consistent with the national goals of sustainable forest management.

In line with the country's aspirations, a National Forestry Policy was promulgated and approved by the NFC in 1977. This policy paved the way for greater uniformity in the implementation of strategies for the achievement of forest conservation, management and development in the country. The policy represents an important piece of legislation, one that is unequivocal in maintaining that forest management must fulfill environmental and conservation needs besides meeting rational economic production goals. The balance that must be achieved among these objectives is thus spelt out in distinct terms in the policy through the multi-pronged strategies embodied therein. Thus, under the policy, strategic and sufficient areas are allocated not just for production but for protection as well as social and educational needs. In tandem with this, policy enactments and rules were formulated and enforced at the various state and district levels to give teeth to the national stance.

To further strengthen the country's capacity to implement sustainable forestry practices, a National Forestry Act was subsequently formulated and passed by Parliament in October 1984. In Sabah, the Sabah Forest Enactment of 1968 provides the legal backing to ensure that the status of the PFE is secured while in Sarawak, the Sarawak Forest Ordinance of 1954 provides the necessary legal framework. The enforcement of these legislations will go a long way towards achieving national objectives, as they now embody a vital change in the philosophy of forest management, away from just ensuring sustainable yield to promoting sustainable management. Henceforth, forest management will be judged not just on the basis of the forests' capacity to produce output into perpetuity, but more so on how the forests are managed to achieve the ever-so-delicate balance among its various functions. As we move towards the 21st century, the dictates of these multi-varied functions will assume greater importance, particularly those pertaining to environmental and conservational considerations.

The National Forestry Policy was revised in 1992 to accord greater emphasis to environmental protection and the conservation of biological diversity. Furthermore, the National Forestry Act 1984 was amended to strengthen its effectiveness in dealing with forest encroachment and illegal logging. Thus, the penalty for any forest offence had been increased from a maximum of RM10,000 or an imprisonment for a term not exceeding 3 years to a maximum of RM500,000 and an imprisonment not exceeding 20 years with a mandatory imprisonment of at least one year. Provision for the Police and Armed Forces to undertake surveillance of forestry activities was incorporated into the new Act and this, together with the stiff penalties, has helped to curb illegal logging and forestry encroachment.

Malaysia is a big player in the tropical timber trade and is fully aware of its global responsibilities in ensuring consonance with national as well as international long term interests. Malaysian forests will thus be managed not just for the benefit of present generations, but also for the generations to come, both for Malaysia as well as for the world. We are mindful of our role as custodian of one of the world's largest and oldest mega-diversities and Malaysia is prepared to meet the challenges that the globalization of forests has presented to all nations, both developed and developing.

As a member of the International Tropical Timber Organization (ITTO), Malaysia is fully committed to the achievement of sustainable forest management by the year 2000. In this respect, Malaysia has taken several measures to operationalize the ITTO guidelines for sustainable management of natural tropical forests and its criteria for the measurement of sustainable tropical forest management. Towards this end, a National Committee on Sustainable Forest Management in Malaysia was established in 1994 under the Ministry of Primary Industries to ensure that the criteria, indicators and activities related to sustainable forest management are implemented. The National Committee has formulated a total of 88 activities, based on 5 criteria and 27 indicators to operationalize the ITTO criteria at the national level. At the same time, steps have been taken to identify 48 activities under 6 criteria and 23 indicators for the forest management unit (FMU) level. The document is also known as MC&I (1999) - it was revised again in 2001 in line with the ITTO's new Criteria & Indicators.

In recognition of the need to strengthen sustainable forest management, Malaysia has also undertaken the critical step of reducing the annual coupe or allowable cutting rate in the country. Thus, the annual coupe was reduced from 46,040 hectares per annum for Peninsular Malaysia during the 7th Malaysia Plan (1995 to 2000) to 42,870 hectares per annum during the 8th Malaysia Plan (2001-2005), and has been reduced still further to 36,940 hectares for the 9th Malaysia Plan (2006-2010). This planned reduction in the logging rate will help in ensuring that the extraction of forest resources is in line with the sustainable capacity of the forests.

The tropical rainforests of Malaysia are a unique natural heritage which has evolved over millions of years. To conserve this invaluable forest resource, Malaysia has established a network of protected areas for safeguarding of biological diversity in the form of national parks, wildlife reserves and sanctuaries, nature parks, bird sanctuaries and marine parks, some of which have been set up since the 1930s. Currently, Malaysia has 2.13 million hectares of conservation areas protected by legislations. Of these, 1.8 million hectares are located outside the PFE, whilst another 0.33 million hectares are within the PFE. In addition, Malaysia has also set aside pockets of Virgin Jungle Reserves (VJRs) to serve as permanent nature reserves and natural arboreta. Since its inception, a total of 120 VJRs covering 111,726 hectares have been established in Malaysia. Taking into account the

network of protected areas and the VJRs, the area that Malaysia has designated for biodiversity conservation totals around 5.19 million hectares, or 27.3% of its total forested land.

For the protection of endangered plants and animals, the Government of Malaysia has compiled a comprehensive list of species highlighted for protection. Furthermore, as a follow-up to the United Nations Conference on Environment and Development (UNCED), a National Committee on the Convention on Biological Diversity has been established to plan, coordinate and implement follow-up actions required under the Convention. A National Conservation Strategy has also been formulated by the Government of Malaysia as part of meeting national conservational objectives.

Recognizing the potential negative impacts of forest harvesting, the Environmental Quality Act of 1974 was amended to include the need for Environmental Impact Assessments (EIA) with effect from 1987, for activities that involve forest land use. Thus, EIAs are required for activities which involve logging and land development schemes converting areas of 500 hectares or more of forest land into different land uses (e.g., industrial, housing, agricultural and aquaculture projects), including the clearing of mangrove swamp forest covering 50 hectares or more, as well as logging or conversion of forest land to other land uses within catchment areas or reservoirs.

Despite the many efforts made by Malaysia to evolve towards fully sustainable forestry, timber and timber product exports continue to be subjected to various pressures to certify or be eco-labeled. In October 1998, based on preparatory work carried out by a Timber Certification Committee in the Malaysian Timber Industry Board, the Malaysian Timber Certification Council (MTCC) (formerly known as the National Timber Certification Council, Malaysia (NTCC)) was incorporated as an independent company. MTCC started its operations in January 1999 as an independent organization designed to establish and operate a voluntary national timber certification scheme in Malaysia. The governing body of MTCC is the Board of Trustees, which determines its overall policy and direction. In addition to the Chairman, the eight other members of the present Board comprise representatives from timber industry associations, social and environmental non-governmental organizations, academic and research institutions and government agencies. At the moment, eight forest management units (FMU) in Peninsular Malaysia have been certified under the MTCC scheme, and one FMU under the FSS scheme, altogether covering an area of about 4.7 million hectares. Whereas for chain-of-custody (CoC), a total of 83 forest industry-related companies have been awarded with MTCC certificates (MTCC 2006). In bringing international recognition to its scheme, MTCC has taken action to discuss and collaborate with other international mechanisms such as FSC and PEFC. The mechanism is now being recognized by the Danish Ministry of the Environment, the Keurhout Foundation (Netherlands), the Royal Society of Horticulture UK, the Ministry of Agriculture and Forestry New Zealand, the Ministry of Environment and Sustainable Development France, and the Forestry Agency of Japan.

Current financial mechanisms

Government allocation

Government allocation continues to be a central source for financing of SFM in Malaysia. At the federal level, the Ministry of Plantation Industries and Commodities has been approved

for an increase in total budget of RM251.5 million for the 9th Malaysia Plan (2006-2010) for forestry activities, compared to the RM199.6 million forestry sector allocation for the 8th Malaysia Plan (2001-2005) (Anon. 2006). This is in comparison to the allocation of the Ministry of Natural Resources and Environment's total budget of RM 6.96 billion for the 9th Malaysia Plan (2006-2010) as compared to only RM3.5 billion for the 8th Malaysia Plan (2001-2005) for sustainable management of the country's natural resources (namely, forests, water and wildlife), with an increase of about 1.3% of the total federal budget. For research and development (R&D), the Federal government has set aside a total of RM5.2 billion for all sectors including forestry in the 9th Malaysia Plan (still open for bidding). The Forest Research Institute of Malaysia, the sole national forestry-related research institute, was approved a total budget of RM48 million in the 9th Malaysia Plan.

Forest Fund

In Peninsular Malaysia, part of the levy imposed on the export of timber products has been allocated to finance SFM projects. Under the scheme, the federal government has decided to allocate RM1 from the Malaysian Timber Industrial Development Fund (MTIDF) for every RM5 spent by state governments in Peninsular Malaysia on SFM. The projects eligible for financing include: forest inventory, preparation of forest management plans, environmental impact assessments (EIAs), computerization of forestry departments, training, R&D and forest certification. The objective of such financing is to influence and encourage state governments to undertake activities in support of SFM. Since the levy is imposed only on exports of timber products in Peninsular Malaysia, the financing is available to states in Peninsular Malaysia only. A total of RM348.9 million was approved to undertake projects related to SFM for a 5-year period (1998-2002). This includes the approved budget for the State Forestry Department (RM208.9 million), the Federal Forestry Department (RM86.6 million), FRIM's R&D (RM8.6 million), Malaysia Timber Industry Board (RM0.45 million), Center for SFM (RM4.1 million), the Malaysia Timber Certification Council (RM40.6 million), and monitoring costs of the Ministry (RM0.47 million). All the projects approved under this fund are still ongoing. For the State Forestry Departments in Peninsular Malaysia, using the ratio of 5:1, indications are that over that same 5-year period state government allocation was about RM200 million (RM40 million $year^{-1}$).

Another forest fund that is available in the country is that of silvicultural cess under the State Forest Development Fund (FDF) that is charged to the logger at the average rate of RM2.50/m^3 of logs removed from the forest, in addition to state income through land premiums and timber royalties. It was reported that in 2004, a total of RM341 million was collected as revenue from all states in Peninsular Malaysia (Dahlan & Azmi 2006). In addition to this, a total amount of RM10 million was collected and deposited into the fund and used directly for forest development and management in the states.

Tax deduction/pioneer status

Several fiscal incentives have been provided by the Federal Government to encourage investment in the establishment of large scale forest plantations. The incentives are in the form of "Pioneer Status (PS)", "Investment Tax Allowances (ITA)" and "Infrastructure Allowance (IA)" being offered to the contractors. "PS" provides 100% exemption of income tax for a period of 15 years after the harvesting date (production period). The "ITA" allows for 100% tax exemption of qualifying capital expenditures incurred within 10 years of initial establishment, which can be deducted from the statutory income of the company. The "IA"

allows the offsetting of expenditures on permanent structures against company income. It is envisaged that the Government will also introduce group relief in the form of attractive tax exemptions during the initial stage of forest plantation establishment, which would also help to reduce the burden of the high capital investment costs. It is well known that timber species require relatively long periods to reach maturity from the day of planting. It varies from 5-7 years for pulp wood and 15-20 years for the production of general utility timber. During the long gestation period, very little or no income is generated, except from the thinning operations. Unfortunately, commercial banks are unwilling to provide loans for investment in forest plantations. The establishment of forest plantations requires very high initial capital outlays. In addition, substantial funds are also required for land preparation, procurement of planting material, labor costs for planting and tending activities, as well as infrastructure development. Even with all of the above incentives provided by the Federal Government, many potential investors claim that these incentives are still not attractive enough to bring in investment in forest plantations.

Forest plantation fund

Development of forest plantations in Malaysia may be considered essential for the production of both sustainable forest products and services. The establishment of forest plantations must also take into consideration the current concern for the environment and biodiversity conservation. In view of this, the concept of multiple use forests could also be incorporated into future forest plantation development. Forest plantations will not only solve the local shortage of raw material supply to the industry, but also reduce pressure on natural forest exploitation. The government has targeted about 350,000 hectares of fast-growing forest plantations with key species such as *Hevea* sp. and *Acacia* to be established over the next 15 years, mainly for the production of timber for the making of furniture, with an annual planting target of 25,000 hectares.

To realize this, the Government, via the Ministry of Plantation Industries and Commodities, has recently established a "Green Bond" with the objective of providing further financial support for the future expansion of forest plantation areas. For this purpose, a Government-Linked Company (GLC) or Special Purpose Vehicle (SPV) has been established to manage and monitor the forest plantation programme. The SPV will raise the 'Green Bond" to fund the forest plantation project. For its initiation, RM200 million has been deposited by the Government in a revolving fund to the bond. In order to ensure that this bond has low coupon value, the Government will guarantee (sovereign guarantee) the bond. SPV will channel the available funds to State Governments or private interests involved in the forest plantation programme. In this case, the State Governments could lease the land to the SPV, or carry out the programme themselves or as a joint venture. The SPV of the State Government may appoint a consultant to carry out forest plantation projects.

Bilateral and multilateral ODA

Despite the wealth of knowledge in tropical forest management, Malaysia recognizes that this is a constantly evolving field and thus will continue to welcome transfers of technology. Malaysia, therefore, pursues positive external collaboration in strengthening its forest management and conservation endeavors. Towards this end, several multilateral and bilateral cooperative projects have been undertaken with foreign partners. Thus, the ASEAN Institute of Forest Management was established with technical and financial support from the Canadian International Development Authority to assist Malaysia and other ASEAN

countries in forestry planning and management techniques. Other undertakings on a collaborative basis include projects in forest conservation, manpower training and research activities with ITTO, Germany, the United Kingdom, the Netherlands, Denmark, Japan and other OECD countries.

Germany, for example, has implemented several pilot projects in Malaysia as demonstrations of SFM. Among the completed projects are the Forestry Planting Material Procurement Programme (GTZ/FDPM/FRIM), the Forest Management Information System Project Sarawak (FORMIS), the Sustainable Forest Management Project Sabah, the Sustainable Forest Management Project Peninsular Malaysia, and Advisory Assistance to the Forest Research Institute Malaysia (FRIM). The latter project supports forest training for the International Tropical Forestry School, University of Malaysia, Sabah.

UNDP/GEF

Malaysia has successfully received several project grants from UNDP/GEF since the Facility was established. As an example, in 2000, a project entitled Conservation and Sustainable Use of Tropical Peatswamp Forests and Associated Wetland Ecosystem was approved and began implementation in 2002. The project was co-financed by DANCED and the Governments of Malaysia and the Netherlands, with a total budget of US$13.665 million (UNDP 2000). The objective of the project was to develop and implement an integrated management plan for peat swamp forest ecosystems. Recently, UNDP approved another grant to Malaysia for a project entitled “Conservation of Biological Diversity through Improved Forest Planning Tools.” The total budget for the project is US$5.7 million, with the Government of Malaysia and ITTO as co-financers.

FACE foundation project

The FACE Foundation project was undertaken in the state of Sabah. Here, FACE has been collaborating with its contract partner - Innoprise/Rakyat Berjaya - since 1993, restoring tropical rainforest that had been severely damaged by large-scale felling. Infapro (the Innoprise Face project) is the first project in the world to restore tropical rainforest on a large scale using the enrichment line planting method. After the forest has been restored, it will continue to be sustainably managed. The project closely collaborates with the adjacent Danum Valley Field Centre, which hosts an international research project of the Royal Society, United Kingdom.

Possible future mechanisms

Clean development mechanism (CDM)

The Kyoto Protocol and the role of forests as carbon sinks offer interesting opportunities for the establishment of new forests for sequestrating carbon. The Kyoto Protocol recognizes the value of forests, their soils and products in climate change mitigation. Afforestation and reforestation were recognized as the only eligible land uses under the Clean Development Mechanism (CDM). The CDM is one of the three "flexibility mechanisms" in the Kyoto Protocol that enables developed countries to achieve a portion of their emission reductions by implementing carbon sequestration projects in developing countries, as well as helping

developed countries meet their reduction targets cost-effectively. Private companies may consider investment under this approach.

Recognizing the importance of climate change and the active involvement of the government in activities related to the Convention, a National Steering Committee on Climate Change (NSCCC) has been established to oversee and address all issues related to climate change, the Convention and the Protocol. The NSCCC has established a two-tiered organization for Clean Development Mechanism (CDM) implementation in Malaysia.

The NSCCC agreed on 31 May 2002 to:

- Establish a National Committee on CDM (NCCDM), including its Terms of Reference (ToR) and membership; and
- Establish two CDM Technical Committees on energy and forestry chaired by the Ministry of Energy, Water and Communications (MEWC) and the Ministry of Natural Resources and Environment (NRE), respectively.

The Terms of Reference of the National Committee on CDM are to: (i) develop policies, direction, strategy, criteria and guidelines for implementation of CDM projects at the national level; (ii) receive, evaluate and recommend CDM project proposals after obtaining comments and views from the Technical Committees; (iii) monitor CDM projects and report their status from time to time to the NSCCC; and (iv) hold meetings of the NCCDM at least four times a year. As of now, 10 CDM projects have been registered but none are forestry-focused (Theseira & Samasudin 2006). This could possibly be because forestry (AR) projects normally involve longer gestation periods as compared to CDM projects in the energy sector.

Payment for environmental services (PES)

The perception that forest goods and services are “free” has prevented the development of markets for them in the past. This, however, is changing with an innovative scheme being applied throughout the world known as Payment for Environmental Services (PES) (WWF 2006). The scheme ensures that those who benefit from environmental goods and services pay those who provide these services. This could mean, for example, that downstream users of water cleansed by an upstream forest, such as bottling companies or city dwellers who extract drinking water from the river, pay those who manage these upstream forests to ensure a sustainable flow of this service into the future. Charging for the benefits provided by forests and other natural ecosystems is a way to recognize their value and ensure that these benefits continue well beyond present generations. This involves managing resources in a manner that ensures they continue to generate environmental services.

WWF is working with other international organizations such as CARE and IIED (International Institute for Environment and Development) as well as a number of local partner organizations on introducing PES schemes. In Malaysia, the highest potential use of this mechanism is with the public water supply and hydro-electric power, as these two sectors need water that originates in forested areas. Discussions on the role that forests play in regulating water flow and providing financial returns to the forestry sector for this service are still on-going.

Some policy and financial strategies to further improve SFM in Malaysia

Policy

Forest and other related policies in the country should be amended and due consideration should be given on the following aspects:

i. The size of Forest Management Units must be set at the district level, considering that all the planning of forest operations and management is done at this level. Each district should have its own working plans, management plans and budget. This would be in line with the requirement of certification, and monitoring and control would be easier.
ii. Logging licenses should be issued at the concession level, involving areas of at least 10,000 hectares. The issuance of logging licenses for small parcels has caused many problems as contractors are not able to undertake RIL and fulfill SFM requirements. Their goals remain short-term with low budgets inputs.
iii. Forests should also be valued for their carbon stocks. In this regard, forest management need not aim only at producing trees suitable for wood products, but also target trees that sequester carbon rapidly.
iv. Promote large scale forest plantations - this is actually a policy level decision.
v. Total ban on the sale of logs and the sale of sawn timber discouraged, with additional incentives for downstream processing.

Financial

In terms of financial mechanisms, some strategies that have already been formulated and proposed are:

i. Continued sourcing of government funds to implement SFM. With the current commitment and strong political will in sustaining forest resources and maintaining environmental stability, a continuous flow of funds from the government is expected,
ii. Continued tapping into funds from outside the country through bilateral and multilateral agreements and ODA,
iii. Encouragement of active participation and contributions from the private sector in financing SFM, and
iv. Networking with neighboring countries that share problems and issues related to the implementation of SFM and working together to identify issues, developing project proposals, and jointly applying for funding.

Conclusion

The achievements of sustainable forest management cannot be attained overnight, nor are the goals static. The whole process is dynamic and evolving. As Malaysia remains committed to attaining SFM, definite steps are already in place to pave the way towards this aim, notwithstanding the transfer of resources, as promised, from the developed North. The package of measures that have been agreed upon and are being implemented represents a comprehensive and concerted effort by all segments of society and stakeholders towards

sustainability. Malaysia is confident that it will achieve sustainable forest management within the given time frame and that Malaysia will remain "green" for future generations to come.

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7 Financing mechanisms for sustainable forest management in Indonesia: the role of public financing instruments

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Abstract

This paper presents the public financing instruments for forestry of Indonesia, especially the Re-greening Fund. The conclusion is that a gap in financing mechanisms exists. The development of a new financing institution that is autonomous and independent to address current issues in forest financing is proposed. It is also be stressed that any new initiatives in forest conservation, including the introduction of forest financing instruments, should be predicated on solving the underlying causes of failure. Therefore, a discussion of the current problems and necessary pre-conditions for achieving sustainable forest management and rehabilitation is also provided. Finally, payment for environmental services (PES) is briefly covered. The definition of "payment for environmental services", the various types of environmental services provided, as well as the role of governments, are clarified. The paper concludes by offering some recommendations for addressing forest financing problems in Indonesia.

Introduction

Forests cover about 120 million hectares in Indonesia, or about 63% of the total land area of the Indonesian islands[19]. Its forest resources contribute significantly to the national income and employment, and have driven national economic development and growth in the last three decades. Forestry policies still focus primarily on supporting economic development,

[19] Data from Forest Planning Board (BAPLAN) in 2003

while less consideration is given to sustainability issues. This situation seriously impacts the productive capacity of the forest, as well as its ecological and social values. About 59.2 million hectares of forestland urgently require rehabilitation, and such degraded areas are increasing annually. The Millennium Development Goal Asia Pacific Report in 2006 gave Indonesia a negative score for its lack of progress in increasing forest cover. Obviously, forest conservation remains a major problem in Indonesia[20].

Illegal logging, forest fires, forest conversion, over-cutting of production forests and failures of forest rehabilitation are the causes of severe environmental degradation (e.g. frequent floods and droughts, decreasing water quality, and reduced land productivity). Studies examining forest rehabilitation issues (Kartodihardjo *et al.* 2004; Haryanto *et al.* 2003) have identified seven broad, inter-related issues as the underlying causes of failure in forest conservation in Indonesia: (1) uncertainty of forest land tenure; (2) limited rights and access to forest land and programs; (3) weakness of forest governance and management institutions; (4) constraints of unsynchronized forestry laws and rules; (5) lack of economic infrastructures for forest management; (6) ineffective financing mechanism; and (7) lack of an incentive system.

The first part of this paper discusses the problems and necessary pre-conditions for achieving sustainable forest management in Indonesia based on its current situation. The authors argue that any new initiatives in forest conservation, including the introduction of new forest financing instruments, should be started first by solving the underlying causes of failure. The second part of the paper describes the current financing mechanisms – one of the forest conservation problems – especially public financing for forestry. The last part of the paper will discuss payment for environmental services, which is receiving much attention nowadays. The definition of "payment for environmental services" and roles of governments in these PES schemes are clarified. The authors conclude by presenting a general summary and offering some recommendations for addressing forest financing problems in Indonesia.

The root causes of forest conservation failure

The unambiguous demarcation of state-owned forestlands causes uncertainty of land tenure. These boundaries are perceived as definitive by the Ministry of Forestry, but involved very little community participation during the field-mapping. The involvement of stakeholders is indeed insufficient, while forest boundary mapping initiated by third parties (e.g. local people and NGOs) is rarely recognized by the authorities (Forestry Planning Board of the Ministry of Forestry in this case).

The forestry laws and regulations tend to limit local people's rights and access to forests and forestry programs. This reduces business opportunities and forestry activities, especially for the local communities. The traditions and cultures of societies living within and close to forests depend strongly on the forest and its products, while their living behaviour is adapted to the capacity of the forest to provide livelihood. The limitation of rights and access, as well as the uncertainty of land boundaries, often cause disputes both between the local people and governmental bodies. Furthermore, such social conflicts result in a disregard for forest conservation and further degradation of forest resources.

[20] Kompas Daily, October 2006

Most of forest land in Indonesia is managed inappropriately. The National Park and Forest Conservation Agencies do not have sufficient manpower or the capacity to properly manage the number of National Parks and Nature Reserves. The responsible management agencies are often neglectful and regulations are applied inconsistently. For example, management of protection forests is handled by stated-owned companies, private forest concessions and district governments, with overlaps and gaps in mandates. Most production forests are in similar situations. One of the reasons for the haphazard management practice is the process of decentralization that is taking place in governmental administration. Unsynchronized interpretation and implementation of forest policy can lead to forest degradation.

In the Forestry Law, all natural forests are placed under one category (i.e., natural forest). However, most forest areas are in fact degraded, and productive forests and degraded forests should be treated differently, in policy as well as technical approaches to their management. Forestry regulations also tend to exclude or constrain public involvement in forest restoration activities and funding mobilization. Furthermore, they create confusion and uncertainty in how to manage degraded forests (such as degraded nature reserves).

The last two underlying causes of forest rehabilitation and conservation failure in Indonesia are ineffective financing mechanisms and lack of incentives. These two factors, which are the main topics of this paper, will be discussed in detail in the following section.

Forest financing mechanisms in Indonesia: current status and issues

Principal policy and financial issues that limit sustainable forest management in Indonesia

Some government initiatives on forest rehabilitation have been implemented since the early 1970s. It started with the Regreening Guaranteed Fund (*Dana Jaminan Reboisasi* – DJR) in 1980. This fund has changed its name to the Re-greening Fund - *Dana Reboisasi* (Box 1) and still continues today. The Regreening Fund is managed by the national government, and the funds are allocated to the provincial and district governments as a Fund for Special Purposes – *Dana Alokasi Khusus*. Since 2003, this fund has been used to finance the national initiative on land rehabilitation called GERHAN, which aims to restore 5 million hectares of degraded land by 2009 (Directorate General of Bina RHL 2006)[21].

The movement has been criticized for its ineffectiveness in addressing the land and forest degradation problems in Indonesia. The government funds for reforestation and GERHAN programs are allocated to farmers as direct incentives (in cash or seedlings) to plant trees on their farmlands. Up to date, the program has achieved little success. The ineffectiveness of these rehabilitation programs is exacerbated by the failure in the management of remaining natural forests. Pressure on natural forests is increasing due to illegal logging, forest fires, land conversion and over-cutting. The rehabilitation activities could only be maintained while financial support was available, as it provided no incentives for sustaining the activities and failed to create a sense of ownership among the local people.

[21] GERHAN program classifies degraded lands into 3 categories: 1st priority land (extremely degraded) such as shrub lands and bare land; 2nd priority land (degraded) such as secondary forests; and 3rd priority land (other land uses).

On the policy and regulatory aspects, the National Forest Law Number 41/1999 Article 35 confirms the existence of funding for investment in re-greening and rehabilitation. The objective of the Investment Fund is to provide financing to ensure sustainable management of forest. The Re-greening Fund previously mentioned is regulated by Presidential Decree No. 31/1989. However, ensuring availability, proper management and use of financing under this scheme remains problematic.

The current funding allocation for forest rehabilitation is given directly to the Ministry of Forestry as a governmental budget. But there is no clear mechanism to distribute this grant to lower levels of implementing agencies, such as the provincial, district and local governments. This usually causes delays in implementing activities. At the national level, the Re-greening Fund is categorized as non-tax revenue, management of which falls under the category of general state revenues in the National Budget for Revenues and Expenses. This makes the provision of this fund to the forestry sector more difficult due to the cumbersome administrative processes. An international consultant auditing this Re-greening Fund stated that the management of the fund is inefficient and needs to be revised (Roffandi 2005).

Moreover, the current national budget distribution scheme for protected areas is based on simply dividing the overall directorate budget among the areas, as opposed to allocating budget to the protected areas based on priorities related to their biodiversity value and management requirements. A study prepared by the Indonesian State Ministry of Environment (McQuinstan *et al*. 2006) emphasized that the severe funding shortage is resulting in inadequate staff, vehicles and support for day-to-day activities on protected areas management. There is an apparent mismatch between the amount of available funding and Indonesia's commitment to developing 30 million hectares of terrestrial and marine protected areas as one of the key activities under the Convention of Biological Diversity (CBD). The study concluded by stating that protected areas in Indonesia suffer a total financial deficit of US$81.94 million in annual operating budget.

The allocation of the rehabilitation grant is based on yearly budget reporting. It means the funds need to be spent and reported within the budget year. For the implementing agencies, this causes difficulties since the rehabilitation activities depend heavily on rainy seasons, which sometimes come at the end of the budget year. The pressure to use up the budget within the year often results in arbitrary spending of funds. In addition, getting the funds made available involves complicated and unaccountable administrative processes. Furthermore, the existing forestry laws are not appropriate to support initiatives on creating new funding sources for forest rehabilitation and conservation; some of the regulations pose barriers to those initiatives and even become driving factors of forest degradation.

Institutional and policy reforms needed to capture additional finances for sustainable forest management

To effectively manage existing funds is one of the keys to addressing the current forest financing problem in Indonesia. Learning from the experiences of Costa Rica and other developed countries, an autonomous and independent financing institution can become an alternative to a national body in managing the existing funds, mobilizing other funding from external sources, including global ones, and channelling those funds specifically to forest conservation.

Box 1.

The Presidential Decree No. 35/1980 created the Re-greening Guaranteed Fund (Dana Jaminan Reboisasi – DJR) in an effort to rehabilitate production forests. At that time, a tax of $4.00 and $0.50 was charged for every cubic meter of timber harvested and wooden chips produced, respectively. The government bank held the fund under a special account of the Directorate General of Forestry, monitored by the Ministry of Agriculture. This fund is a performance bond, meaning it will be returned to the forest concessionaires once they have conducted rehabilitation on their cutting areas.

Despite the good intentions in creating the fund, it was under-utilized. Two reasons could be found. First, the profits of the logging operators were high enough to cover the cost of forest rehabilitation without the use of the fund. Second, the fund was considered by some as an alternative to not conducting any rehabilitation because of the limited duration of cutting permits. As a consequence, the fund became ineffective and inactive because of the limited use (i.e., only for rehabilitating cutting areas being charged for the fund). Some changes have since been made in the management of the DJR to make it more effective:

i) The government widened the scope of the fund to forest types other than production forests, including degraded lands in general. As a consequence, the fund changed its name to the Re-greening Fund (Dana Reboisasi – DR).

ii) In 1989, a government regulation was effected stating that the Re-greening Fund is to be used only for rehabilitating non-production forests. The fund, therefore, became a subsidy to rehabilitate forests in general. There were controversies over the failure of production forests to sustain yields into the future.

iii) In 1999, another government regulation made a drastic change to the status of the Re-greening Fund from obligatory contribution to non-tax state revenue, thereby changing its philosophical function and distribution mechanism. The fund, managed under the Ministry of Finance, had been used not for forest rehabilitation but to cover operational costs of the government and for national development. However, the new Forestry Law No. 41/1999 sought to reverse the function of the Re-greening Fund to forest rehabilitation and stated that an alternative financial management institution is needed for this purpose.

(Source: Roffandi 2006)

As mentioned previously, some supportive policies and laws do exist for the establishment of this independent institution. For example, Article 21 - Forestry Law Number 41/1999 states that a financing institution to support the development of the forestry sector is needed. At the policy level, the development of an alternative financing institution can fit under the 'Institutional Development of Forestry and Plantation Programs.' This is a part of the Strategic Plan for National Forestry Program (*Renstra Dephutbun*). It is recommended that the financing institution be autonomous, independent and credible to manage and allocate funds for forest rehabilitation and management, either from national or international sources.

Roffandi (2005) recommended that this alternative financing institution (*Lembaga Keuangan Alternatif - LKA*) should act as an executing agency in distributing the funds. In this case, the funds are managed by LKAs and not by the Ministry of Finance. It is implied that the funds

under LKA should not be limited to a one year budget cycle as in the state budget, allowing transactions to be made at any time depending on the season and investors' readiness.

The LKA can have a head office in the capital city to oversee national-level business, while LKAs at the provincial level are suggested to manage funds at local levels (the portion of reforestation fund for the province is 40%). From the regulatory perspective, the LKA should be developed as a financing institution legitimated by Governmental Regulation (Peraturan Pemerintah – PP) based on the previously mentioned Forestry Law. Furthermore, it is recommended that the status of LKA be a state-owned-company (Roffandi 2005). To support the LKA, a set of institutions should be established in the form of land and forest management units. These units at the national, provincial and district levels would formulate and review rehabilitation plans and fund disbursement rules, and monitor and evaluate activities.

Currently in Indonesia, a competitive fund allocation process has been implemented to improve the management capacity and performance of higher education institutions. The system allows the Ministry of National Education to disburse funds to state and private universities to support multi-year programs, although the operation of this grant is still regulated under the national finance laws. The Ministry or the Directorate General does not intervene, but monitors the implementation of activities based on assigned criteria. The fund recipient must provide commitment for counter budget. A similar system can be adopted in the management of forestry financing to allocate funds to its management units.

Thinking for the future

Improving forest financing within existing setups

Tomich *et al.* (2004) argued that three broad problems were causing people's ignorance in environmental conservation, namely policy distortion, market imperfection, and market failures. Policy distortion or misguided policy often results from the government setting a target without consideration of the risks to local livelihoods and other environmental impacts. For example, establishing a yearly budget for the national reforestation program pushed the operators to accelerate the activities and treat it as an annual project. Most of the time, they precluded community participation. Because of the lack of project ownership by the local communities, the programs were unsustainable and the lack of maintenance resulted in wasting of financial resources.

Furthermore, market imperfections, including high transaction costs, insecure tenure and lack of access to banking services, can be constraints to forest conservation and rehabilitation (Tomich *et al.* 2004). These problems often occur in developing countries as observed by Kartodihardjo *et al.* (2004) and Haryanto *et al.* (2003).

Market failures exist where no market price exists for certain public goods, such as in the case of environmental services. It results in externalities referring to the effects of activities by one economic agent on another that are not reflected in market prices. The existence of externalities opens avenues to negotiations between actors who provide environmental services (ES providers) and beneficiaries of these services (ES beneficiaries). Economic incentives are more effective than command-and-control in guiding potential ES providers to protect and rehabilitate the environment.

The stages of the environmental issue cycle (Winsemius 1986; Tomich *et al.* 2004; van Noordwijk *et al.* 2006) describe the prominence of environmental externalities – both positive (environmental service) or negative (environmental degradation) – and the evolution of public perception over time through social interaction and scientific enquiry. Depending on the scale of people involved and how their influence and concerns are impacted, policy makers at various levels of the government can choose one of four strategies in responding to the demands of various stakeholders (Tomich *et al.* 2004; van Noordwijk *et al.* 2006). These are: (i) ignore the issues for as long as possible; (ii) make efforts to stop the root causes; (iii) mitigate degradation to meet the agreed environmental threshold; and (iv) prevent or reduce degradation by modifying the behaviour of land users.

Van Noordwijk *et al.* (2006) further offered a number of options in solving environmental problems. The options are: (i) regulate the behaviour by setting standards based on the (sometimes perceived) environmental threshold; (ii) stimulate stakeholders to seek innovative solutions within the set of standards; and (iii) provide an incentive scheme to reward stakeholders who give positive externalities or improve the environmental quality. Environmental degradation that exceeds the established threshold will usually cause damages and may even result in human casualties. The polluter-pays-principle applies in this situation. In other words, the victims need to be compensated by the party responsible for the environment degradation which caused economic or other losses. For Indonesia, the current case of hot-mud flows in East Java is a good example of how both environmental and human-welfare damages have been inflicted from environmental degradation.

Another situation is when rights-to-pollute exist and the actors (sellers) have not fully utilized this right. The buyers can make use of these rights by operating in the red zone (lower than the environmental threshold, e.g., the “cap and trade” mechanism under the Kyoto Protocol or the program for reducing water salinization in Australia). Alternatively, the actors involved may decide not to utilize them for the sake of conservation (e.g., the conservation concession concept). The conceptualization of rewards for environmental services (RES) starts with the understanding that the behaviour of one actor can improve or maintain environmental quality above the set standard. Farmers applying land conservation techniques to reduce river sedimentation and local communities restricting certain land use for conservation are such examples.

Potential of PES in financing sustainable forest management

Market-based mechanisms have the potential to provide additional revenues for financing forest management and rehabilitation. Markets for environmental services can take the form of either compensation (or rewards) for environmental services (CES or RES). A review of the current situation shows that a patchwork of regulations and initiatives in developing rewards for ES schemes have been implemented at different scales (van Noordwijk *et al.* 2006). Developing markets for environmental services as financing instruments, especially at the national level, should be started with sufficient understanding of these different scales and the concepts of CES and RES should be carefully considered.

Adapted from Norton (1988), Tomich *et al.* (2004) highlighted the distinctions of macro (global), meso (regional transboundary, national and inter-community) and micro (intra-community) scales of environmental goods and services. Table 1 presents 12 prototype situations describing the scales of environmental services. This implies that opportunities exist in developing ES markets at various scales.

At the global scale, markets for biodiversity and carbon sequestration have great potential. Markets for watershed protection mostly apply at the meso-scale, especially between communities at the watershed level. The effects of upstream land cover change on hydrology downstream can be obvious, and watershed functions in regulating water flow and providing good quality water is intuitively easy for the local people to understand. Therefore, the value of watershed conservation can be easily comprehended and marketed at this level. It can also work well at regional transboundary scale, especially for land-locked countries such as in Europe. A market for landscape beauty (and biodiversity conservation) can potentially exist at global, regional and national levels where the inherent values of nature and biodiversity are recognized, and where there is a desire to leave these natural areas for the future generations. At the micro level, the existence of cultural values for the environment and ecosystem support for livelihoods is important.

Table 1. Environmental services at different scales

Environmental Service Typology	**Macro**	**Meso**			**Micro**
	Global	**Regional trans-boundary**	**National**	**Inter-community (within province, district)**	**Intra-community**
Watershed protection					
1. Total water yield for hydroelectricity via storage lake	---	-	+	+++	-
2. Regular water supply for hydroelectricity via run-off-the-river	---	+	+	+++	-
3. Drinking water provision (surface or groundwater)	---	+	+	+++	+
4. Flood prevention	---	++	+	+++	+
5. Landslide prevention	---	++	+	++	+
6. General watershed rehabilitation and erosion control	---	++	++	+++	-
Biodiversity conservation					
7. Biodiversity buffer zones	+++	+	++	+	-

Environmental Service Typology	Macro	Meso			Micro
	Global	**Regional trans-boundary**	**National**	**Inter-community (within province, district)**	**Intra-community**
around pro-tected area					
8. Biodiversity landscape corridor	+++	+	++	+	-
Carbon sequestration					
9. C restocking degraded land-scapes	+++	++	+	--	---
10. C protecting soil and tree stocks	+++	++	+	--	---
11. Guaranteeing production land-scapes meet environmental standards	+++	++	+	--	---
Landscape beauty					
12. Providing guided access to landscapes of high beauty and/or cultural and spiritual value (ecotourism)	+++	++	++	+	+

---	very poor	+++	very good
--	poor	++	good
-	marginal	+	some possibility

Adapted from: van Noordwijk (2005)

The roles of the government will differ at each ES level. At the global level, the national government can act as ES providers. For example, when an Annex I country such as Indonesia enters the carbon market under the Kyoto Protocol, the Indonesian government will be the one to receive carbon payment for their rehabilitation efforts as set forth in the Protocal. In Costa Rica, the National Institute for Biodiversity represents the national government in making agreements with bio-pharmaceutical industries and universities for bioprospecting in protected forests (Rojas & Aylward 2003).

Conclusion

To achieve sustainable forest financing in Indonesia, it is essential to solve the root causes of forest conservation failures, such as uncertain forest land tenure, limited access of the local people to forest resources, insufficient capacity at all levels in managing forests and inconsistencies in forest law, regulations and management schemes. Therefore, reformulation of the rehabilitation plan, forest fund disbursement rules and monitoring and evaluation mechanism will form a good foundation for developing innovative forest financing strategies.

Despite its many constraints, the forest rehabilitation program undertaken since the early 1970s have been based on good intentions of the Indonesian government. Various funds, laws and policies have been developed to support it. The most recent and promising one is the provision in the National Forestry Law to establish a financing institution that would support the development of forestry sector. The financing institution needs to be an autonomous, independent and credible agency to manage and allocate funds to forest rehabilitation and management activities. It should expected to simplify the complicated bureaucratic processes.

As the most recent trend in financing forest management, interest in PES has grown considerably in recent years. In many cases, PES schemes have been perceived as potential gold mines for additional national income. Careful consideration must be given when applying PES schemes at the national level. It should start by understanding the different levels of environmental services, as well as the role of governments at each level. Moreover, the income from PES should be fully invested in forest management as the providing source of environmental services. A good monitoring process is also essential. Last but not least, strong political will is still the most important key in developing a robust financing mechanism for sustainable forest management.

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8 Financing instruments and financing strategies for sustainable forest management in the Fiji Islands

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Abstract

This report aims to assess the current situation in the Fiji Islands with regard to existing financing instruments, mechanisms and strategies in the forestry sector. Key questions include how much the forestry sector contributes to the GDP and to the national budget, and which financing instruments for sustainable forest management (SFM) are already in place. Most financing instruments in place consist of traditional instruments such as taxes, fees, royalties, etc. However, one innovative instrument is in place which requires further improvement before it can become an instrument applicable to other countries. From our point of view, financing instruments need to be embedded in financing strategies for sustainable forest management. Such financing strategies require a basic set of data, some of which are assessed in this report. They provide clear and somewhat surprising insights.

Introduction

A financing strategy is needed to finance measures and programmes within national forest programmes or processes and to sustain the long-term economic basis of sustainable forest management (SFM). This report aims to assess the current situation in the Fiji Islands with regard to existing financing instruments, mechanisms and strategies in the forestry sector. Key questions include how much the forestry sector contributes to GDP and to the national budget, and which financing instruments for SFM are already in place. The data have been collected through several expert interviews, written material, and analysis of various studies,

[22]*Views expressed in this paper are those of the author and do not represent the position of GTZ Deutsche Gesellschaft für Technische Zusammenarbeit and SPC Secretariat of the South Pacific Community.*

etc. in order to answer the above-mentioned questions and to identify starting points for developing a financing strategy for SFM

There is currently a good window of opportunity to develop a financing strategy for SFM in the Fiji Islands, as the National Forest Policy Statement is being deliberated and finalised. Furthermore, the Ministry of Fisheries and Forests (MFF) is developing a strategy up to the year 2020. Both papers propose a number of measures and projects for which financing has not yet been found, and both propose the implementation of several financing instruments. However, these instruments do not seem to be fully articulated or coordinated.

Status quo of financing instruments

This chapter assesses which financing instruments for SFM are already in place in the Fiji Islands.

Transfer payment approaches

Private sector contributions

Local communities and landowners benefit from a financing instrument that is not regarded as such. The Government incorporated the state-owned company Fiji Pine Limited in 1990. It is a 99.8% government-owned company and has acquired a total stocked area of approximately 49,000 hectares of pine. This provides approximately 227,000 m^3 of logs per year; mainly processed into sawn timber and wood chips.

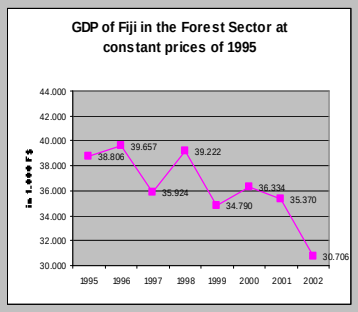
Local communities and landowners own only the remaining 0.2% of the company's shares, and these shares are the only ones eligible to receive dividends. As the *de facto* owner (99.8% of the shares) of the company, the Government has waived its entitlement to profits in order to support local communities. However, Fiji Pine Limited is not very profitable. A positive exception was the year 2004, when total revenue was FJD6.2 million. Despite the profits made by Fiji Pine Limited and the regulations in place, no dividends have been paid until today. However, the company is contributing to land owner development through the Fiji Pine Trust, with an annual grant of FJD$250,000.

Within this transfer payment approach, landowners and local communities would be able to develop social infrastructure and schools and to support training measures and activities such as capacity building. In many cases, these measures decrease the pressure on forests, as landowners and communities do not necessarily depend on the (often unsustainable) use of forests.

The same principles and systems apply to Fiji Hardwood Corporation Ltd., which manages the country's mahogany plantations.

Government Expenditure

How much the Government allocates to each sector of the economy depends on its importance for the economy and for society in general and on the Government's priorities.
A sector could more easily become a priority for Government allocation if present and future contributions to the budget and its economic, environmental and social contributions became clear. According to the *Fiji Islands Bureau of Statistics* (2005), the forestry sector contributes about 1.64% to GDP.



At present, the Government does not intend to change the distribution of the company's shares. The major constraint of this financing instrument is that it is not clear whether and how much profit will be generated in the future.

Taxes, fees and charges

Designing taxes, fees and charges for environmental purposes can have highly positive environmental impacts. The 2005 budget estimated for the Department of Forestry was FJD17.74 million. This department implements projects and undertakes measures to support SFM.

The Government has to collect revenue to finance the national budget. The general tax system in the Fiji Islands includes *inter alia* a general sales tax (VAT, standard rate 12.5%), a corporate income tax (30%) and a progressive personal income tax (ranging from 0% to 31%, starting at FJD2,800 per annum).

In addition to the general tax system, specific taxes, charges and fees are raised in all economic sectors, influencing the behaviour of stakeholders and having implications for the development of the sector.

Taxes, fees and charges in the forestry sector

Natural forest

A summary of all of the different forest charges currently paid for harvesting roundwood in the natural forest in Fiji is given in the Table. The first five charges (royalty, premium,

commission, goodwill and land rent) represent charges for the use of the resource. They account for the majority of total charges paid. The other charges are charges paid for services provided by the Forestry Department and the NLTB (National Land Trust Board).[23]

Table 1. Summary of forest charges for natural forest in Fiji in 2003[24]

Type of charge	Amount by species class (in FJD per m^3)				Beneficiaries
	Class 1	Class 2	Class 3	Class 4	
Royalty					
Zone 1 (Viti Levu)	40.00	30.00	10.00	6.50	National Budget
Zone 2 (Vanua Levu)	40.00	30.00	9.30	6.00	
Zone 3 (elsewhere)	32.00	32.00	8.00	6.00	
Premium					
Zone 1 (Viti Levu)	4.00 - 6.00				NLTB
Zone 2 (Vanua Levu)	Nil				
Zone 3 (elsewhere)	Nil				
Commission					Landowners (negotiations between producers and landowners
Zone 1 (Viti Levu)	20.00 45.00	10.00 20.00	10.00 15.00	10.00 12.00	
Zone 2 (Vanua Levu)	15.00 25.00	10.00 15.00	10.00 15.00	10.00 12.00	
Zone 3 (elsewhere)	Data not available				
Goodwill	0.50 - 12.00				Landowners
Land Rent	Varies				Landowners
Scaling Fee	3.50				Provider of services (Forestry Department – FD)
Map Fee	100 - 200				Provider of services (FD)
Application Fee	1000 – 1500 (for renewal lower)				Provider of services (NLTB)
Renewal Fee	Varies (charged on the basis of cost recovery)				Provider of services (NLTB)
Processing Fee	Varies (charged on the basis of cost recovery)				Provider of services (NLTB)

[23] FAO (2004)
[24] FAO (2004): p. 29.

Royalties, premiums and commissions are currently being raised in three different zones to reflect the differences in operating costs between the islands. They are divided into four species classes to reflect different values and qualities (class 1-4).

Royalties, premiums and commissions are charged by cubic meter. Royalties contribute directly to the national budget, except those from native lands, which are paid to the NLTB. Premiums are paid to the NLTB and subsequently distributed to the landowners, who are also supported through projects. Commission payments are negotiated directly between producers and landowners. There are also goodwill payments, which may be made either in cash or in kind.

The land rent is area-based and has to be paid by producers that hold a long-term forest concession. However, this rent is relatively low. For three different forest reserves the rental in 2004 was about FJD1.90 per hectare per year.

The fees are charged for specific services on a cost-recovery basis. The scaling fee is collected by the Forestry Department and applies to each cubic meter of roundwood harvested. It is designed to cover the costs related to production monitoring and control. However, it does not currently cover the total costs of providing that service, which means that the required standard of service cannot be provided for lack of resources. The Forestry Department charges producers for harvesting maps and plans, which have to be presented when applying for licenses, though the costs are relatively low (FJD100-200). Fees for application, renewal and processing are charged by the NLTB to cover the costs of approving and processing licenses.

Plantation areas

The majority of plantations are pine (approx. 49,000 hectares) and mahogany (approximately 45,000 hectares).[25] Both companies that run plantations (Fiji Pine Limited and Fiji Hardwood Corporation Ltd.) have to pay premiums of FJD12 per hectare and land rents of FJD9 per hectare. In addition, landowners receive 10% of the stumpage value of all harvested roundwood (Table 2).

Other than the VAT, neither Fiji Pine Limited nor Fiji Hardwood Corporation Ltd. pay taxes. Payments such as premiums and land rents are immediately directed to local communities or landowners, and the Government waives potential income by not having established tax schemes for plantations. The Government does not charge taxes because it aims to promote the establishment and management of plantations. However, the same rules and laws should apply to private sector companies, otherwise, a distortion of competition would limit opportunities for private sector companies to become active in plantation forestry.

Table 2. Summary of forest charges for plantations in Fiji in 2003

Type of charge	Amount (in FJD per m^3)	Beneficiaries
Premium	12.00	NLTB
Stumpage value (similar to royalty)	10%	Landowners
Land Rent	9.00	Landowners

[25] Ministry of Fisheries and Forests of the Fiji Islands (2005): Annual Report 2004. Suva, Fiji Islands.

Trust funds

Two trusts, the Fiji Pine Trust and the Fiji Hardwood Trust, have been set up by the Fijian Government. These funds are supported by the Government through regular budgetary allocations and through contributions made by Fiji Pine Limited and Fiji Hardwood Corporation Ltd. The Fiji Pine Trust is supported through an annual grant of FJD250,000 by Fiji Pine Limited and a Government grant of FJD600,000. Both funds support local communities and landowners in implementing SFM and promoting capacity building.

Furthermore, there have been efforts for the past few years to establish a trust fund to support the conservation of a high biodiversity forest area in central Viti Levu, Sovi Basin. But it is not yet established.

The Government needs to consider the long-term sustainability of these kinds of funds, as it may become difficult to support them year after year through national budget allocations. Other sources for replenishing the fund have to be examined, as it currently seems that the Fiji Pine Trust is limited by the current modality.

Market-based approaches

Payment for environmental services (PES)

In some parts of the world (mainly in Latin America), payments for environmental services (PES) are well known. The general principle of this instrument is that those who benefit from environmental services pay those who produce and provide them.

In Fiji, there currently are no projects in place termed 'payments for environmental services.' However, there are instruments in place which could loosely be described as falling under PES. Water catchment areas have been leased and compensation is paid by Fiji Water – which runs the water supply of Fiji Islands – and the government to the landowners for foregone income. This results in a good recognition and appreciation of forest services. Proposals are, however, on the table, including some involving environmental service payment schemes and some involving environmental fiscal reform.

The National Forest Policy Statement proposes that the Government should charge all taxpayers a certain amount of their taxable income (the figure being discussed is 1.5%) as a conservation tax. The income generated by this tax is to be used strictly for conservation purposes. The rationale behind it is that the entire population benefits from forest services – clear water, stable micro-climates, protection from erosion, etc., and therefore everyone should pay for the provision of such services.

Brief evaluation of the instrument

It is politically very difficult to implement new taxes and fees. The Government may therefore devote considerable thought to how best to sell and market the possible new tax.

In addition, the Government may not only think about inhabitants benefiting from environmental services, but also about visitors coming to the Fiji Islands. Costa Rica has applied a departure charge/tax for all passengers on outgoing international flights, for example (approximately USD10; this revenue is used directly for forest conservation).

Payment for Environmental services – entrance fees

Entrance fees are usually collected to cover the costs of running national parks. Entrance fees are imposed in some (marine) conservation areas in the Fiji Islands. Fees are also charged for the forest park at Colo-i-Suva. In 2004 12,579 visitors came to Colo-i-Suva, paying fees totalling around FJD23,000.

Brief evaluation of the instrument

As most parks in the Fiji Islands are frequently visited by tourists, a reasonable amount of funds can be generated. Prior to establishing such fees, an agreement needs to be reached on how the funds will be used.

Promoting private investment

Credit schemes

There are no credit schemes designed to promote SFM or the setting up of plantations. Specially designed credit schemes for SFM with lower interest rates than those of the market would reduce capital costs and make investment in SFM more profitable. Furthermore, such schemes take account of the particular long-term needs of investors in forestry and the associated lengthy gestation periods.

The Fiji Development Bank has not yet funded forestry projects due to concerns about the long-term investment horizon, as the bank normally calculates amortisation rates of a maximum of 10 years and internal rates of return of 8-10%. Although forestry projects may be able to comply with such internal rates, they cannot be amortised within ten years due to their long gestation periods. Nevertheless, the bank would assess project proposals requesting funding for SFM, and forestry projects geared towards developing the economy of the Fiji Islands are likely to be approved.

The Government may consider using this instrument if it wants to encourage the establishment of plantations through private companies and investors. Despite the lack of such a scheme, two companies are already investing in private plantation management.

Analyses of financing instruments in the Fiji Islands

This chapter aims to assess the contributions of the forestry sector to the national budget. This assessment is based on existing financing instruments. In addition, an attempt has been made to estimate the share of GDP accounted for by the forestry sector. The data basis is weak in all cases. The contributions made to the GDP and the national budget by the forestry sector in the Fiji Islands are calculated using available data from the years 1997–2005.

As mentioned above, GDP figures for forestry, as they are normally calculated, do not include timber-processing industries, which depend on forest resources and could hardly exist without them. This report, therefore, also takes into account the processing industries, workers in all fields of forestry and timber-processing industries, among others.

Revenues raised and contribution to GDP

In 2004, roundwood production totalled 434,424 m³. Of this, 101,859 m³ came from natural forests (mostly tropical hardwoods); a total of 315,655 m³ was pine, some 88,417 m^3 grew in woodlots and an additional 227,239 m³ was harvested in plantations owned by Fiji Pine Limited. A further 16,910 m³ of mahogany was harvested from plantations. The majority of harvested pine is processed, mainly into wood chips, for export to Japan.[26]

Based on the fact that producers in natural forests have to pay approximately FJD80-122 per m³ (depending on the species of timber)[27] in forest taxes, royalties, fees, and other charges for logging activities, it can be estimated that producers pay approximately FJD15-22 million per annum.

Roughly one-third of these payments are destined for the national budget, while the other funds are either paid to and distributed by the National Land Trust Board (NLTB), or are paid directly to local communities. Even if the national budget does not benefit directly from the payments to the NLTB, it could be argued that the NLTB implements projects that would normally be implemented by the Government, such as the construction of schools and infrastructure. This saves the Government costs which would otherwise be borne by it.

Fees are generally lower for plantations. Fiji Pine Limited and Fiji Hardwood Corporation Ltd. pay approximately FJD45 per m³ harvested. As both companies harvest a total of approximately 244,000 m³ per annum, the NLTB, landowners and local communities receive estimated payments totalling approximately FJD11 million, while the national budget does not benefit from these payments, as the Government waives all taxes and fees.

In total, the NLTB and the national budget receive approximately FJD26-33 million through mechanisms such as royalties, premiums, fees and rents from timber-harvesting activities in natural forests and forest plantations. These numbers do not include timber processing, export revenues, taxes on export, reforestation measures, and costs for harvesting.

What contributions do logging activities make to the GDP?

According to an FAO study[28], producers pay costs of approximately FJD64 per m³ for felling, skidding, transport, road building and so on. Assuming that most of these costs arise from the use of capital costs such as machinery and fuel, labour costs would account for only around 20% of this. At a production volume of 434,424m³, it was estimated that all forest workers together earn approximately FJD5.6 million for logging activities. This also makes a significant contribution to the GDP.

There are no detailed data on the number of forest workers officially employed, so it is impossible to estimate accurately how much income tax is paid. However, there are 1,141 certified harvesting operators[29], including chainsaw, bulldozer, skidder and loader operators. Income tax on a progressive scale applies for incomes above FJD8.000 per year, which will increase to FJD10,000 in 2007. As remuneration in the forestry sector is low, the majority of

[26] All data from: Ministry of Fisheries and Forests of the Fiji Islands (2005): Annual Report 2004. Suva, Fiji Islands, p. 42 et seq.
[27] FAO (2004).
[28] FAO (2004).
[29] Ministry of Fisheries and Forests (2005): Annual Report 2004. Suva, Fiji Islands.

workers are estimated to earn between FJD5,000-6,000 per year. This means that minimal, if any, income tax is paid.

Additional costs have to be met by timber-processing companies. According to the FAO study, the labour costs for 1 m³ of processed timber amount to approximately FJD122 per m³. As a log export ban is in place, it is assumed that all timber harvested is processed in the country. Thus, remuneration in the processing industry totals close to FJD 66 million, yet another contribution to the GDP.

Saw mills pay a corporate tax of an estimated FJD35 per m³ of timber processed. This results in revenue of approximately FJD2.5 million for the national budget, as sawmills had an output of 70,475m³ of sawn timber in 2004. This does not include the taxes paid by other timber processors, such as the factories producing wood chips. Data on these processing companies are not available.

Earnings from the export of timber and other wood-based products totalled FJD37 million in 2004. According to the Ministry of Fisheries and Forests' Annual Report 2004, this accounted for about 2.3% of the GDP. Minimal export taxes apply. Assuming that they are about 2.5% (no data could be found), they would contribute an additional approximately FJD1 million to the national budget.

Not only does exported timber contribute to the GDP and the national budget, but also timber remaining in the domestic markets. The VAT rate for all products sold in Fiji is 12.5%.

Approximately 240,000 m³ of timber is processed into wood chips. All wood chips are destined for export. A total of 150,000 m³ is used to feed saw mills, which produce 95,000 m³ of sawn timber that remains in the domestic market.

Processors can already be assumed to pay costs of FJD225 per m³ for harvesting, transport, royalties and fees for the domestic market[30]. According to the FAO data, the average product value of processed timber is FJD600. Including capital costs and profits, producers can be assumed to sell 1 m³ of processed timber (sawn wood) for approximately FJD760.[31] Sawmills therefore have total timber product sales of around FJD72 million. They pay 12.5% general sales tax (VAT) on this. The national budget receives another FJD 9 million through sawn timber, which most probably would not be raised were it not for logging activities in the Fiji Islands.

Sawn timber is processed into furniture and other items that generate revenue for the national budget and contribute to the GDP. Specific data have yet to be assessed. Due to the growing furniture industry, several additional million FJD can be assumed to be contributed to the GDP and the national budget. Broader cluster studies will be able to answer these kinds of questions.

Finally, the wages and staff emoluments paid in the Department of Forestry contribute approximately FJD3.4 million to the GDP. Income tax has to be paid on wages. As the 274 employees earn an average of FJD12,280 per year, the average income tax paid is estimated at 20%. Income tax to be paid by employees in the Department of Forestry therefore totals FJD670,000.

[30] FAO (2004): p. 50f.
[31] FAO (2004): p. 53.

Table 3. The forestry sector and its contribution to GDP and the national budget

Financing instruments, revenue raised, additional income, charges etc.	Contribution to GDP (in million FJD)	Contribution to national budget/NLTB, local communities, land-owners (in million FJD)
Forest taxes, royalties, fees etc. from natural forests		In total: 15 – 22 National budget: 5 –7.3 NLTB: 10 – 14.6
Fees and other payments from plantations		NLTB: 11
Labour costs for logging activities	5.6	
Income tax of forest workers		Data not available
Labour costs within processing industries	66	
Income tax of workers in processing industries		Data not available
Corporate tax of saw mills		Approx. 2.5
Export of timber and wood-based products	37 (according to MFF 2.3% of GDP)	
Financing instruments, revenue raised, additional income, charges etc.	Contribution to GDP (in million FJD)	Contribution to national budget/NLTB, local communities, land-owners (in million FJD)
Export tax on timber products sold (assumed to be 2.5%)		1
VAT rate for timber sold on the domestic market (approx. FJD 72 million)		9
Further processing (furniture industry etc.)	Data not available	Data not available
Dividends of Fiji Pine Limited and Fiji Hardwood Corporation Ltd. (indirect contribution, as the Government waives profits)		6.2
Wages and staff emoluments in the Department of Forestry and associated income tax	3.4	0.67
Entrance fees	Data not available	Data not available
Total	112	45.37 – 52.37

Conclusion

These rough calculations (based on tentative data and estimates) indicate that the forestry sector plays an important role in the Fijian economy and the budget of the Fijian Government. Its role is even more important than indicated by official figures published by the Fijian Government, and its significance is currently underestimated.

The forestry sector contributes FJD112 million (more than 5%) to GDP. This is more than three times as much as the official share of GDP accounted for by the forestry sector in 2002, which the Fiji Islands Bureau of Statistics estimated at 1.64% in 2002.

The forestry sector contributes about FJD45.37-52.37 million to the national budget and the NLTB. This is nearly three times the amount received by the Forestry Department in the fiscal year 2005 (FJD17.74 million).

These data show that the forestry sector has a much greater role and significance in the Fijian economy than the official data suggest.

It must be remembered that the data basis is fragile and that certain estimates and assumptions may be questioned. However, the assessed data show a clear trend: The forestry sector plays a much more important role in Fiji's economy than one might have thought.

Econometric models and more detailed data could be used to provide further and better calculations of how much the sector contributes to the national budget and GDP. Fuel for transporting timber, the purchase of construction material for roads, machinery and its maintenance all contribute to the GDP and the national budget, and these data should therefore be included.

In most cases, economic activities in the forestry sector and adjacent timber-processing industries would not take place without forests. If timber were imported, this would result in higher production costs (especially due to the high transport costs in the South Pacific), increased unemployment and changes in the current accounts and trade balances. It would not only decrease the competitiveness of these industries, it would force companies (e.g. wood chips producers) to shut down.

Potential of financing instruments for SFM

Transfer payment approaches – payment for environmental services:

In Sect. 2.2.1, it was mentioned that Costa Rica charges all passengers on international flights USD10 for forest conservation purposes. Implementing this financing instrument in the Fiji Islands would raise approx. FJD5 million per year (assuming that each passenger is charged FJD10, and 500,000 passengers visit the Fiji Islands each year. The number of foreign tourists in 2004 was 500,280).

Market-based approaches – forest certification:

Fiji Hardwood Cooperation Ltd. produces approx. 17,000 m³ of mahogany per year (this figure will increase in the coming years). If it were all destined for export, approx. USD200 per m³ could be obtained for good-quality timber. If the company were to certify the timber, it could obtain a price premium of approx. 10-20%, which would provide additional income of USD340,000-680,000 (approx. FJD600.000-1.200.000) per year due to certification. There are already good examples in the Asian region – e.g., Malaysia's Deramakot Forest Reserve – where price premiums of more than 20% on certified timber have been paid.

In view of its large mahogany plantations, the Fiji Islands could become one of the world leaders for certified plantation mahogany.

Even if the timber and forestry sector in the Fiji Islands has a greater impact on the national economy than one might have thought, there is still a long way to go before it becomes a billion Fiji Dollar sector. Considerable effort will be required to achieve this goal.

The Government aims to sustain resources so that they can contribute not only to economic development, but also to social and environmental development for the well-being of the people of Fiji. To make this happen, new financing instruments need to be implemented, e.g. payment for environmental services. A variety of financing instruments implemented jointly are needed to finance SFM in the long term. The joint implementation of financing instruments must be planned and agreed on within a financing strategy. This strategy can be integrated into the *National Forest Policy Statement* or the MFF's strategy up to the year 2020.

Recommendations

This report shows that the forestry sector already makes a significant contribution to the national budget and to GDP in the Fiji Islands. However, it has become obvious that there is both a large potential for further and additional contributions by the forestry sector and a need for further investment in forestry to further promote its economic role and to sustain its important environmental and social contributions to the country. Both the *National Forest Policy Statement* and the strategy of the Ministry of Fisheries and Forestry up to 2020 outline various financing instruments and mechanisms.

The role and the (financial) contributions of the Government, the private sector and other stakeholders need to be clarified. The question of long-term financial planning in the sector needs to be answered, especially in view of the Prime Minister's pledge to make the forestry sector a one billion FJD business.

It is therefore necessary to:

- assess through econometric modelling and more detailed data how much the sector contributes to the national budget and the GDP;
- analyse the realistic potential of proposed and new financing instruments (in the National Forest Policy Statement and in the MFF's strategy up to the year 2020) and to assess and analyse their implications and impacts;
- assess the (financial) support that would be necessary to implement them;
- prioritise which financing instruments are best, taking account of the situation in Fiji;
- assess which financing instruments could be combined locally, nationally, regionally and internationally;
- clarify the role of stakeholders involved in implementing the financing instruments and associated strategy;
- provide recommendations on how to finance SFM by introducing financing instruments and implementing a financing strategy for SFM; and
- plan and organise specific steps to implement financing instruments and a financing strategy for SFM.

Developing a financing strategy for SFM in the Fiji Islands will strengthen the *National Forest Policy Statement* and the entire forestry sector, helping to sustain its economic and social basis for the future of the Fiji Islands. This would be a major step towards achieving the goal of becoming a billion dollar business.

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9 Stimulating forest plantation development through incentives – in search of the elusive blueprint for success

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Abstract

The argument that much of the timber production in the future in the Asia-Pacific region would come from planted forests is a tenable one. However, investment into plantations remains risky, and in many places not the most attractive land-use option in financial terms. As such, there is growing interest in favour of incentives for forest plantation development. This paper attempts to capture the key findings of experiences of countries in the region that have provided incentives for such a development. The paper provides a working justification for providing incentives, and looks critically into efforts by governments over the years at trying to stimulate plantation growth. In several cases the incentives have been criticized for bringing about negative results, including producing monocultures which impoverish the environment, societal benefits are meager, unplanned conversion of natural forests, or "crowding-out" potential investments from the private sector. Nevertheless, incentives do provide a stimulus if applied appropriately. Direct incentives were found to be important in the initiation stage, to increase the pace and scale of plantation establishment. Once plantations reach maturation stage, the key strategy is to maintain private-sector interest in plantations by reduction of barriers and removal of structural impediments and operational constraints. Providing adequate tenure arrangements and resource security appear crucial. Other incentives are of a long-term, and include a favourable investment climate, research, technical assistance, and well-established markets. Some guiding principles that need to be considered for providing incentives are proposed, but also cautions against them if they result in higher societal costs than benefits.

Introduction

There appears to be a consensus that eventually the Asia–Pacific region will largely run out of wood derived from natural forests. An increasing number of countries are imposing logging bans or restricting harvesting in natural forests in one way or another. Where logging of natural forests is still taking place, wood production is often described as unsustainable. Only around 11.56% of the region's natural permanent forest estate (within member countries of the International Tropical Timber Organization) is considered to be under sustainable forest management (ITTO 2006). Furthermore, there is (World Bank 2006) rampant illegal logging that ensures that what once was a cherished and valuable resource will be a threatened or endangered ecosystem in less than a decade in many countries.

Some four decades ago, seminal publications such as the *Limits to Growth* (Meadows *et al.* 1972) reminded us that we would be running out of natural resources faster than predicted, even by pessimists. The early years of the new millennium are experiencing a very similar debate. The doomsayers are announcing that the days of wood production from natural forests will soon be over. The debate has now turned to where the wood is supposed to be sourced from. The answer is simple: forest plantations or planted forests, a term that appears to be more in vogue recently[32]. The problem is that plantation estates are not large enough to feed wood-hungry nations, either currently or in the near future. Investing in forest plantations is not without risks, and in many locations financially it is not the most attractive land-use option. It is, therefore, no surprise that the private and public sectors have joined hands in arguing that incentives are crucial to forest plantation development.

While the case for incentives appears to be extremely strong, perhaps we should step back for a moment and have a closer look at the paths and pitfalls before rushing into incentives. In fact, several questions require answers: What are the valid arguments for providing incentives? What are the arguments, just as valid, against providing incentives? What sort of incentives are actually at the disposal of those who would like to use them and what do we know about their impacts, especially in the Asia–Pacific region? Are there compelling reasons for providing incentives for forest plantation development in a situation where a great variety of economic sectors are struggling to obtain preferential treatment, including freebees or inducements, which is basically what incentives are?

This paper reviews the experiences of countries in the Asia–Pacific region with providing incentives for forest plantation development. The paper summarizes the key findings of an Asia–Pacific Forestry Commission (APFC) regional study conducted in 2002/03 (Enters & Durst 2004). It begins by providing a working definition for incentives to set the boundaries of the discussion. A justification for providing incentives is followed by a brief discussion of criticism leveled at governments over the years for stimulating "wrong" behavior with the help of incentives. Special features of investing in forest plantations are reviewed, before the discussion moves on to the effects that incentives have had on the plantation sector. The paper concludes that the search for a blueprint for successfully providing incentives remains elusive, as situations between and within countries vary substantially. Instead, it proposes some guiding principles that need to be considered in determining whether incentives should be provided – and cautions that incentives can send the wrong signals that may result in higher societal costs than benefits.

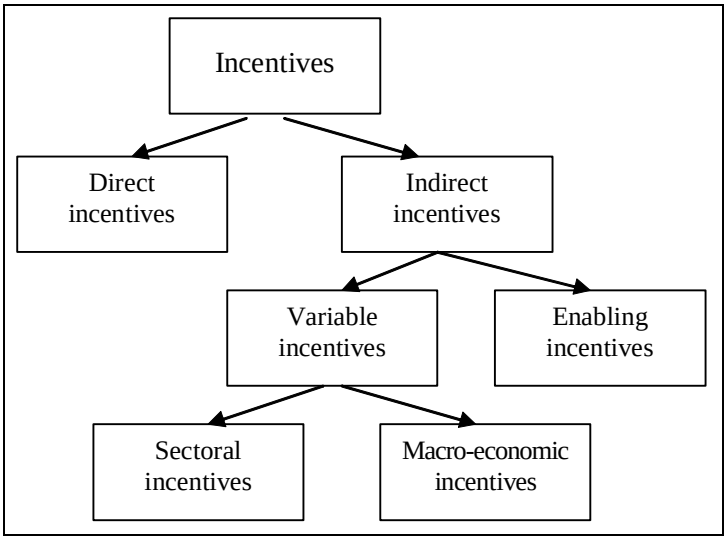
[32] *The terms "plantations" or "forest plantations" will be used in this paper.*

What are incentives?

Definitions for incentives are aplenty. A single agreed upon definition is hard to come by (Meijerink 1997). Defined in very broad terms, an incentive is *anything that stimulates people to act* (Giger 1996; cited in FAO 1999). Sargent (1994; cited in Tomforde 1995) defines incentives as *signals that motivate action*. From a policy instrument perspective, they have also been described as *carrots* that can replace or complement regulatory frameworks, i.e., the *sticks* (Enters 2001). To be of interest to those who are supposed to be stimulated, incentives need to affect the cost-benefit structure of economic activities such as growing trees. Hence, for the purpose of this paper, incentives are defined as *policy instruments that increase the comparative advantage of forest plantations and thus stimulate investments in plantation establishment and management*.

This definition is broader than the more narrow definition for subsidies. The latter are usually described as payments provided to reduce the costs of or raise the returns on an activity. The broader definition includes research and extension, and sectoral and macro-economic policies which, as will be argued in this paper, establish much of the general investment climate and heavily influence the economic behavior of individuals and corporations. Consequently, the spectrum of incentives is fairly broad. A distinction needs to be made between direct and indirect incentives (Figure 1).

Figure 1 Typology of incentives



The distinction between direct and indirect incentives is somewhat blurred. Direct incentives are designed to have an immediate impact on resource users and influence returns to investment directly, which is why they are called “direct”. Indirect incentives on the other hand have a less direct effect through setting or changing the overall framework conditions within and outside the forestry sector. Unsurprisingly, there are overlaps. For example, tax

concessions for plantation investors are a direct incentive, whereas general tax reductions for fuel are considered indirect incentives, because they lower production and transport costs within - as well as outside - the plantation sector.

Incentives that are provided directly by governments, development agencies, non-governmental organizations and the private sector include the following:

- goods and materials (e.g. seedlings, fertilizer etc.);
- specific provision of local infrastructure;
- grants;
- tax relief or concessions;
- differential fees and access to resources;
- subsidized loans; and
- cost-sharing arrangements and price guarantees.

Indirect incentives comprise *variable incentives* and *enabling incentives* (Table 1). Variable incentives are economic policy instruments that affect the net returns that producers earn from investments. Enabling incentives on the other hand mediate an investor's potential response to variable incentives (FAO 1999). They can also be viewed as elements in the investment environment that affect decision making. A country's enabling incentives determine to a considerable extent investment risks, and information about them needs to be constantly updated to guide investors.

Table 1. Distinguishing variable from enabling incentives

Variable incentives		Enabling incentives
Sectoral	**Macro-economic**	
• Input and output prices • Specific taxes • Trade restrictions e.g. tariffs)	• Exchange rates • General taxes • Interest rates • Fiscal and monetary measures	• Land tenure and resource security • Accessibility and availability of basic infra-structure (ports, roads, electricity etc.) • Producer support services • Market development • Credit facilities • Political and macro-economic stability • National security • Research and development • Extension

In the Asia–Pacific region, a great variety of incentives have been, or are currently, on offer somewhere to entice investors (from smallholders to large corporations) to put some of their resources into growing trees. There has been a gradual evolution in the way that governments in the region have provided encouragement, with increasing recognition that the removal of structural impediments and market distortions and the creation of an "overarching climate of enterprise" is the most effective (and economically efficient) incentive in the long run. This shift in thinking has also unfolded in Latin America with a move from subsidies to the removal of impediments (Haltia & Keipi 1997).

What's the justification for providing incentives?

Investors would naturally like to receive incentives to lower the investment burden and thus increase returns to invested capital or labor. But why should potential investors in forest plantation development receive incentives? If potential investors are dissatisfied with the low returns on their investments in plantations, is it not more appropriate to suggest they invest in a more profitable land use? What makes forest plantations so special that they deserve support - basically taxpayers' money - that other land uses cannot obtain? Let's try to find some answers to the questions posed.

From an economic perspective, incentives are meant to correct disparities between the financial attractiveness of an investment and its broader benefits to society (FAO 1999). According to Gregersen (1984; cited in Pardo 1990) incentives from the public to the private sector are justified, in an economic sense, when one or both of the following conditions exist:

- Social (or economic) benefits are greater than private (or financial) benefits associated with a given private action; and
- Social costs are less than private costs associated with the given action and social benefits are at least equal to private benefits.

Where plantations provide environmental services such as watershed protection and carbon sequestration, incentives are accordingly appropriate because private net returns are often lower than social benefits. In each of the following cases from the Asia–Pacific region, incentives bridge the divergence between public and private goals and support activities that are, at least to some extent, in the public interest:

- Soil Bank Program, Agricultural Conservation Program and the Conservation Reserve Program in the United States of America;
- "Grain for Green Project" and the Great West Development Program in China;
- Landcare deductions for capital expenditures on soil conservation, prevention of land degradation, and related measures in Australia;
- The Green Isarn Project in Thailand; and
- Benefit-sharing arrangements under joint forest management in India.

Incentives are not needed when the private returns from plantation management exceed those from other land uses (Haltia & Keipi 1997; Williams 2001). In this case, the provision of incentives translates into a misallocation of public sector resources, merely enabling investors to earn "above normal" returns.

Other important justifications, aside from addressing environmental concerns, include employment generation (particularly in less developed rural areas), and jump-starting the development of national forest industries in countries with comparative advantages (Williams 2001). Incentives may be particularly justified to increase the pace of plantation development where a nascent industry requires a minimum supply of raw material (Scherr & Current 1999). A rapid increase in scale is especially critical in commodity industries like pulp and paper, where economies of scale are essential for operating competitively (Clapp 1995).

Why have incentives been criticized?

The societal benefits that, especially, monocultural plantations can provide have been questioned vigorously, especially by environmentally-minded non-governmental organizations. Plantations have not only been criticized for impoverishing the natural environment, but also for displacing people. In addition, it has been pointed out that forest plantations may create fewer jobs than they destroy. While this is not to say that there is no reason for providing incentives, each case needs to be carefully scrutinized cautiously, so that scarce public resources are not squandered on investments that may provide only meager benefits to society at large. For this reason, the use of incentives, especially direct incentives, has been at the center of intense, and sometimes fierce, debate.

Attractive incentives offered in the early stages of a new initiative or project run the inherent risk of simply "buying" participation; the interest shown is not of a long-term nature. Numerous examples have shown that subsidies have often succeeded in stimulating the adoption of conservation measures that have later been abandoned, or even actively destroyed, once payments ceased (Lutz *et al.* 1994). The same has been observed for plantation establishment (Sayer 1993). It should be borne in mind, especially with regard to commercial activities, that incentives should act as a catalyst, and not be the principal driver of change.

Incentives may also have unintended, perverse side effects. For example, incentives for plantation development may contribute to unplanned conversion of natural forests. A lack of financial support for the management of plantations, coupled with incentives limited to plantation establishment, may lead to intensive planting activity without any real expansion of the total plantation area in the long run. Young plantations are simply destroyed and the land replanted to capture the financial support.

As Tiffen (1996, p. 168) has pointed out, "even poor people can find capital for what is really profitable…." One reason for low levels of investment in plantations, especially by small-scale farmers, may be insufficient information about suitable technologies, market opportunities and legislation, and not a lack of money *per se*. The reasons for inaction may not be properly understood and financial incentives, provided in lieu of advice, are wasted. This lack of knowledge should be corrected with technology transfer and extension programmes.

In addition, a "crowding-out effect" has been observed, which occurs when government spending directly substitutes for private sector expenditure that would otherwise have occurred. A degree of crowding out occurs when incentives are provided to plantation growers who would have planted trees without them — or when a higher rate of incentives are paid than would have been necessary to induce a grower to plant trees. Crowding out also occurs when incentives increase the comparative advantage of one activity over another, which may be just as desirable and viable without taxpayers' financial support. This may also be called substitution effect. Crowding out as a measure of overall efficiency is often hard to assess, except in very broad terms.

Very little work has been done to gauge the relative efficiency of incentives. In Indonesia, during the 1990s, subsidies encouraged around 900,000 hectares of planting under joint venture arrangements, while independent private companies planted 700,000 hectares during the same period, without receiving any such subsidies. The significant planting carried out by private companies that were ineligible for subsidies suggests an element of

crowding out. It also shows that subsidies were not necessary to encourage the establishment of some short-rotation plantations.

To what extent are investments in plantations different from other investments?

Several characteristics of plantations strongly influence investors' decision-making relative to alternative investment options. The most obvious is the long-term nature of growing trees, which typically, in the Asia–Pacific region, is 10 to 30 years, depending on production objectives, tree species, and natural factors. Very high expenditures occur early on; bumper revenues may only be realized at the end of a rotation. Long gestation periods add greatly to the uncertainty and risk of investments in plantations. In addition, the lack of regular cash flow often leads to liquidity problems. There are also considerable difficulties in withdrawing from the investment before the trees have reached maturity. Plantations that are midway through their rotation appear only occasionally on the market for sale.

Then there are nagging uncertainties about future prices of products and inputs — especially regarding the marketability of the final plantation product. For example, due to recent steep increases in freight costs, it is extremely difficult to find buyers for *Acacia mangium,* produced in Papua New Guinea (PNG). The General Manager of Stettin Bay Lumber Company, located in West New Britain of PNG, informed the first author in October 2006 that "nobody wants the stuff, not even for free."

Because of progressive income tax systems (under which tax rates soar with increased income), investors can be hit with the highest marginal taxation rate in the year of harvest unless tax relief is provided. The minimum commercially viable investment in a plantation is also likely to be large, relative to an investment in agriculture on the same land.

These uncertainties and characteristics give ample cause for investors to shy away from the plantation sector, and explain why there are persistent calls for incentives.

What do we know about incentives and their impacts?

So, what is the role of incentives in helping to finance plantation resource development? What have been country experiences? What can we learn from the pitfalls and success stories, and how can they help us to develop a blueprint that identifies the right incentive at the right time? In other words, what does it take to motivate people to grow trees for producing wood?

Incentives are neither inherently good nor bad. Of all the incentives that have been provided over the last several decades, not one has emerged as being obviously "perverse." The analysis of plantation histories indicates that the development stages of a country's plantation estate have largely determined the impacts of incentives. Three development stages can be distinguished: initiation, acceleration and maturation. It is necessary to look closely at the stage that a country has reached, before deciding on the potential of particular incentives, especially direct incentives. We will return to these various stages further below.

Direct and indirect incentives can be presented in a hierarchical order of sophistication. The order starts with the provision of free seedlings. It is simple and straightforward and has survived as a common incentive for decades. The order of sophistication continues through such incentives as tax relief for individual entrepreneurs or adjustments of interest rates, which favor all investors. The order reaches its highest level when policy instruments are applied to

create a favorable and attractive investment climate through the reduction of risks and the removal of structural impediments. The analysis that follows progresses up the hierarchy and development stages, and discusses aspects surrounding the provision of incentives and their impacts. But first let us briefly look at recent plantation histories.

What are the similarities and differences in plantation histories in Asia and the Pacific?

Forest plantation development in the nine countries that were examined in the APFC regional study showed as many differences as similarities (Enters & Durst 2004). Although the paucity and variable quality of data complicates the finding of answers to frequently asked questions, two general conclusions can be drawn. First, there has been a pronounced shift from public to private sector involvement, which includes large-scale corporate investors, forest industries, farmers and local communities. In Sabah and the United States of America, the bulk of plantations have always been in private or semi-private hands. Although in most other countries there have been long-running attempts to involve the private sector, greater participation by private growers mainly started only during the 1980s and in some countries (for example, Thailand, Indonesia) only in the 1990s.[33] Shifts were most dramatic in New Zealand, where the government sold off most of its plantations during the 1990s. Of today's 1.827 million hectare plantation estate, the State holds only a meager 87,000 hectares (MAF 2004).

Second, most plantings started during the 1980s, peaked during the mid-to-late 1990s, and have since slowed, with the exception of China. There are numerous reasons for this quite uniform development. Australia, New Zealand and the United States of America have reached a maturation or consolidation stage, although forest policies continue to support the plantation sector. However, since the price spike in the early 1990s, land-use competition and lower than expected forest product prices have dampened investor interest. Also, the number of plantations that are reaching the end of their first rotation is increasing steadily. For example, in parts of Australia, plantations are into their third rotation (Roberts 2002) and the area harvested is increasing rapidly, so that some new investment funds are being directed to re-establishing sites after harvesting, rather than planting new sites (NFI 2004). In other words, reforestation is replacing afforestation, a clear indication of a mature plantation sector.

China and India find themselves in the early acceleration stage. The booming economies of both countries have freed financial resources for the expansion of plantations. The transfer of responsibilities to communities (India) and households (China) also assisted state efforts in tree growing. Owing to land shortages in India (mainly due to artificially created land ceiling laws[34]) progress in plantation development has somewhat slowed, but maturation is not yet in sight. The private sector shows great interest in covering larger areas with trees and many companies collaborate closely with farmers in wood production (Lal 2004).

Indonesia, the Philippines and Thailand are still at the initial stage of plantation development, although tree growing in these three countries has a long history. However, the strategic involvement of the private sector is in its infancy. There are two main reasons for this. First,

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[33] *This assessment excludes the fact that, for decades, smallholders in a number of countries contributed quite substantially to plantation development.*

[34] *The land ceiling laws do not allow the holding of large areas (maximum is 21.85 hectares) by the private sector.*

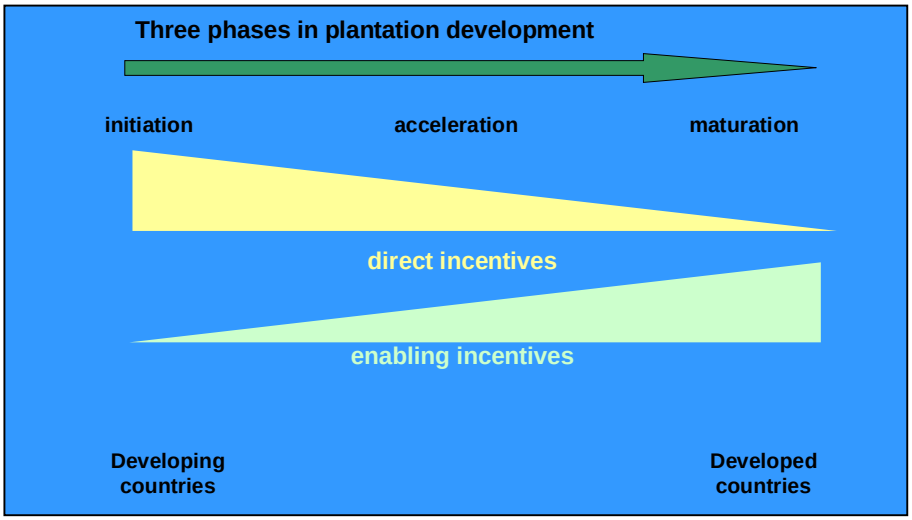
for decades, the three countries viewed their natural forests as inexhaustible. To some extent, this continues to be the case in Indonesia. In the Philippines and Thailand, on the other hand, the imposition of logging bans indicates that governments have revised policy objectives from production to conservation. Both countries were unprepared for the impacts of logging bans on wood supplies. Although substantial efforts were undertaken to involve the private sector in tree planting and, sometimes, generous direct incentives were offered, progress came to almost a complete halt when the Asian financial crisis hit in 1997. While developments in Indonesia are not a mirror image of what has happened in Thailand and the Philippines, private sector involvement has never really gotten off the ground. Annual planting rates between 1993 and 1998 averaged 250,000 hectares in Indonesia, but these were reduced to negligible levels thereafter. Even the subsidized returns from fast-growing plantations, the industrial timber plantations (*hutan tanaman industri*; HTI), were rather unattractive (Potter & Lee 1998, cited in Williams 2001). Oil palm, on the other hand, remains a very lucrative option. It does not suffer from any crowding out or substitution effects. Instead, there are instances where oil palm plantations have replaced timber plantations.

Sabah is a special case. State corporations and companies have played a major role in tree growing there since 1973. Planting rates have been steady, although the considerably higher returns from alternative investments (such as oil palm), have led to a decline in interest. Plantation development has never accelerated sufficiently to reach the maturation stage and currently the area covered is barely stable or, may even be in decline.

What are common incentives?

A variety of incentives have been used throughout the Asia–Pacific region. Comparisons of impacts among countries are difficult, since even schemes that are generically similar differ in detail. For example, there is little potential for analyzing the “price sensitivity” of plantation growers to various cash grant schemes since circumstances in different countries (and over time in the same country) vary markedly. Similarly evident is the incompatibility of various tax concessions offered in countries. However, a broad evolutionary hierarchy can be perceived in the types of incentives at different stages of plantation development (Figure 2).

Figure 2. Incentives and plantation development over time



With few exceptions, forest plantation development on a significant scale was initiated by the State, which supports the argument that an initial critical mass is necessary to ensure private-sector involvement. Once the involvement of the private sector is sought more directly, the use of incentives appears to progress gradually from provision of free inputs to grants and loans, to tax concessions, to joint venture arrangements, and finally to a focus on creating an enabling environment and removing structural impediments (Table 2).

Early government efforts to engage the private sector in tree planting have tended to focus on the provision of physical incentives. In the United States of America and New Zealand, one early incentive was land grants, which encouraged settlement and, under certain conditions, tree planting. As long as governments maintained extensive land banks in sparsely settled regions, this was a relatively low-cost incentive which promoted both tree planting (not necessarily very effectively) and settlement. More recently, China has provided significant land allocations to farmers for tree growing.

The provision of free seedlings has been a common direct incentive around the world. Such free inputs are appealing because they are straightforward. They are also less intimidating - especially to small-scale investors - than more bureaucratic incentives such as grants and subsidized loans which may require completing complex paperwork. However, free seedlings do not stimulate planting as effectively as cash grants, because most grants are financially more attractive and provide more flexibility than bulky physical inputs. Many forest agencies continue favoring the provision of free or low-cost seedlings because, within their own administrative systems, funds for nursery activities can be easily budgeted.

Table 2. Plantation development and incentives

Country	State planting	Low-cost seedlings	Land grants	Nursery subsidies	Survival incentives	Grants to growers	Concessionary loans	Tax concessions	Joint venture arrangements	Research and extension	Resource security	Focus on enabling incentives and removal of structural constraints
Australia	X						X	X	X	X	X	High
China	X	X	X			X	X			X	X	Medium
India	X	X	X	X	X	X	X		X	X		Low
Indonesia	X					X	X	X		X		Low
New Zealand	X	X	X			X	X	X	X	X	X	High
Philippines	X		X				X	X		X		Low
Malaysia (Sabah)	X							X		X		Medium
Thailand	X	X				X	X			X		Low
U.S.A.	X	X	X			X		X	X	X	X	High

Cash grants and concessionary loans have proven popular at various times in many countries. These instruments have triggered significant plantings in China, while in Thailand the effectiveness of grants has been mixed, mainly because the grants were not sufficiently

attractive. In a number of countries, these more direct financial incentives have been followed by a more complex approach - namely, the offering of tax concessions. Tax breaks - which have been notably successful in Australia, New Zealand and the United States of America - can be especially effective in helping bridge the long gap between an initial plantation investment and later revenues generated by the final harvest.

More recently, several countries that had earlier focused mainly on physical incentives and later on indirect incentives, have shifted to an emphasis on enabling incentives, removing structural constraints, and creating an attractive environment for plantation investment.

What can direct incentives achieve?

Assessing the impact of direct incentives in isolation from other incentives is difficult, and the results can be misleading. Owing to a lack of monitoring, it is difficult to determine the extent to which direct incentives have accelerated planting relative to other factors. In some locations, extensive areas have been planted without direct support, which suggests that funds have sometimes been spent inefficiently or unnecessarily.

In an environment characterized by strong disincentives (e.g. requirements for obtaining permits for cutting, transporting and processing wood, low timber prices, inconsistent policies, high fire risks, high land prices, high interest rates, uncertain marketing opportunities) and an opaque bureaucracy, direct incentives may have only marginal effects. In the worst case scenario, they may lead to misallocation of funds and trigger investments in plantations that are ultimately not viable. They may even have long-term negative impacts on interest in growing trees.

When the general investment climate is favourable and demand for wood increases, direct incentives can increase the speed with which the private sector is drawn to forest plantations. The most effective direct incentives include tax concessions and favourable capital gains treatment. Loan and grant schemes have achieved mixed results - some being more generous than others - and have favored predominantly large-scale investors.

There are five caveats to this general assessment:

- Many direct incentives are costly to administer properly and transparently, and it is questionable whether the high transaction costs they incur make them an efficient tool, particularly for attracting small-scale investors;
- Tax concessions can only work if investors actually pay taxes. This is especially significant in countries where paying taxes is sometimes seen more as an option than a requirement;
- Direct incentives are easily abused. Free seedlings may be resold, loans used for unintended purposes, and corruption is virtually impossible to detect and control;
- Direct incentives are frequently flawed if they are designed according to the interests of the provider (usually the government), rather than with the needs of the recipients; and
- In some instances, World Trade Organization rules or national policies may preclude the use of certain types of overtly protectionist incentives, such as import restrictions.

What about indirect incentives?

Variable and enabling incentives generally play a much larger role in encouraging investments than direct incentives. Direct incentives can influence the speed of change, but are an expensive and frequently inefficient means to effect change.

Commercial investments in forest plantation development aim to maximize financial returns and consequently, high timber prices — and perceptions that prices will continue to climb in the future — have frequently triggered investments in tree growing. Perhaps the most attractive and tempting recent stimulus for many investors was the global spike in wood prices in 1993 and 1994. It triggered a planting boom in many countries. Conversely, when wood prices have been low, or especially where prices have been kept artificially low, plantation investments have been sluggish. Under such circumstances, investor interest is seriously dampened irrespective of the provision of any incentives. Examples include:

- Price controls, as they existed in New Zealand until 1965;
- Depressed timber prices due to cheaper imports (for example, Canadian exports to the United States of America);
- A policy of cheap raw material for the wood-processing industry (for example in Indonesia); and
- Illegal logging (for example in Indonesia and India).

Prices also need to be reasonably predictable and provide returns to investments comparable to, or better than, those from similar land uses (for example, oil palm, rubber or pastoral farming). In Malaysia, Indonesia, Papua New Guinea and many other tropical countries current returns to investment in oil palm are considerably higher than for trees, thus discouraging potential investments in forest plantations. Alternative investment opportunities will always compete with forestry and even where the plantation sector is well established some investors may switch to other land-based investments such as dairy farming, as indicated by Terry McFadgen, the former Chief Executive of Fletcher Forests Ltd. in New Zealand. In early 2003, he warned that "if the forestry industry continues to perform at its current level and if dairy continues to perform better, then yes there will be some conversions" (Graham 2003).

Policy consistency and institutional and macro-economic stability are crucial for obtaining significant levels of investment in plantations. Investors come forth when risks are perceived to be low and governments signal unambiguous support for private-sector involvement in plantation development (Clapp 1995). This has not been the case for the Philippines and Indonesia, which explains, to a considerable extent, the relatively poor performance of tree planting by the private sector in these countries. Frequent policy changes (e.g. wood today and bio-energy tomorrow) provide a climate of insecurity for investors. In some countries, frequent changes of government have resulted in repeated changes in policies and the erosion of support mechanisms. For example, between 1982 and 2002, Thailand had 10 governments, and the new governments rarely followed the paths of their predecessors. Political stability has also led to conflicting policies and constrained investments in the Philippines and Indonesia.

A key factor is resource security. The decollectivization of land and forest tenure in China, beginning in 1978, provides an excellent example of the importance of respected and protected property rights. A principal goal of the reform was to encourage farmers to manage forest resources sustainably and to plant trees. The reform has been neither smooth nor uniform, and forest tenure arrangements often vary even among townships, while

not all collectives have been equally enthusiastic. However, a clear pattern is discernible: where decollectivization has gone furthest, there have been significant increases in investments in tree growing (Lu *et al.* 2002).

Just as clear tenure arrangements have underpinned the success of forest plantation development in Australia, New Zealand, the United States of America and parts of China, uncertain tenure has constrained investment in Indonesia, Thailand and the Philippines. In extreme cases, tenure and land-use conflicts have resulted in the destruction of plantations and equipment (Kartodihardjo & Supriono 2000), which is naturally a deterrent to investors.

In New Zealand, the development of infrastructure (e.g. roads, railways, modern port facilities, hydro-electric power stations) by the government paved the way for large-scale processing initiatives and assured potential planters that the government was serious about developing a viable plantation sector. Similar developments occurred in Australia and the United States of America. These measures were complemented by increased research and extension, which reduced risks, raised yields, effectively lowered costs and increased revenues.

In several countries, policies are in place to encourage plantation development, but little is done to translate these into strategies and action on the ground. This may include examining incentive structures across all sectors of the economy to ensure a level playing field for investments in forest plantations. The role of the public sector as a forest owner and manager should regularly be reviewed to ensure that public-sector plantations do not compete unfairly with private-sector investments. Public-sector plantations are affected differently by taxes and land prices and often determine log prices and log allocation, as has been the case in Australia. In addition, the rates of return from public-sector plantations may not reflect the market cost of capital.

Removing impediments to plantation development often means reducing or eliminating subsidies in other directly competing sectors of the economy, especially in agriculture. In Thailand, for example, financial support through the Rubber Plantation Aid Fund for the replanting of rubber amounts to approximately US$1,000 per hectare, whereas the Private Reforestation Extension Project offered less than half that amount for timber plantations. Such substantial differences provide investors with the wrong signals. Other factors may also sour the investment climate for plantations relative to other sectors, such as when markets for plantation products are restricted in a discriminatory fashion, or when foreign investments in plantations are constrained relative to other sectors.

In most countries, the expansion of plantations has been to some extent paralleled by increasing objections over the use of natural forests for timber production. As concerns over the fate of natural forests have increased, decision makers have passed a variety of harvesting restrictions in numerous countries (Durst *et al.* 2001). While this has provided a window of opportunity for investments in plantations, environmental concerns over monoculture plantations have translated into worry for investors. In Thailand, environmentalists warned that, "...commercial eucalypt plantations are incompatible both with forest conservation and with village livelihood(s)" (Lohmann 1990, p. 9; see also Lang 2002). Environmental campaigns against tree plantations have clearly affected investor behavior in some countries, including the United States of America.

Have incentives been justified on social grounds?

As discussed above, incentives provided by the public to the private sector are justified only if they generate benefits to society. If they only increase returns to investors, they are not justified.

Forest plantations generate employment, but this benefit may be outweighed by job losses in agriculture at the local level and by the costs of significant restructuring in local economies (Tonts *et al.* 2001). In Australia, for example, there is some unease about the impact of plantations on demographic, economic and social structures. To address concerns, both plantation companies and governments have disseminated information, improved communication, adjusted statutory and strategic planning systems, and tried to bring different stakeholders closer together (Schirmer & Tonts 2002).

Where social benefits are insignificant, the private sector, and particularly the processing industry, can play an important role in motivating landowners to plant trees. In India, private companies have offered a variety of incentives to smallholders, including technical assistance and buy-back guarantees (Saigal *et al.* 2002). Similar arrangements can be found in other countries (for example, Australia, Indonesia, New Zealand, the Philippines and Thailand). This suggests that private companies may be in a better position than governments to reach small-scale growers (Desmond & Race 2003).

To reiterate, high social benefits, coupled with insufficient or even negative private returns, are a rational justification for offering incentives to investors. However, in many cases the social benefits are not obvious, nor is tree growing inherently unprofitable. Applied economic analysis is rarely used to assess whether a particular level of support is justified. This is not surprising, since broad agreement on how social benefits should be valued is even more elusive. Thus, incentives tend to be offered based on less tangible criteria, including in some cases political maneuvering and favoritism.

What can be concluded and recommended?

The roles played by the private and public sectors in forest plantation development have undergone major changes, although the level of success in attracting private investors to plantations varies considerably. Plantation development can be divided into three stages: initiation, acceleration and maturation. Australia, New Zealand and the United States of America had reached the maturation stage by the 1990s. Most Asian countries are still in the initiation or early acceleration stage.

Direct incentives are most likely to be important in the initiation stage, to increase the pace and scale of plantation establishment, especially to build up raw material supplies for a nascent processing sector. Ultimately, direct incentives can only be effective if an enabling environment already exists or if investors believe that first steps towards creating an enabling environment have been initiated. Direct incentives should be complemented and ultimately replaced by variable incentives.

Over the long term, a favorable investment climate, research, technical assistance and well-established markets usually have greater influence than direct incentives such as free seedlings, subsidized credit or cost-sharing of planting expenses. In countries with a long history of providing incentives, it has become evident that incentive systems must be timely,

well targeted and flexible if they are to successfully engage the private sector in forest plantation development.

In countries that have reached the maturation stage, it has been recognized that key measures to maintain private-sector interest in plantations relate to the reduction of barriers and the removal of structural impediments and operational constraints. Some measures, such as providing adequate tenure arrangements and resource security, are difficult to undertake, but crucial to success. Others, such as tax reforms, removing unnecessary regulations, and eliminating bureaucratic procedures (licensing and permits) are just as important and in many cases easier to realize. While there is no single effective strategy, it is possible to outline some guiding principles that will contribute to achieving a viable forest plantation sector.

Guiding principles for plantation policy

DO	DO NOT
▪ **Ensure that social benefits** outweigh financial benefits	▪ **Promote inequitable land-use policies** that favor other sectors (e.g. agriculture) over forest plantations
▪ **Provide a stable and coherent forest policy** that is supportive of economic activities	▪ **Persist with export or import controls** that hinder the development of efficient wood processing and/or forest plantation establishment
▪ **Ensure that other (non-forestry) policies are aligned** so that plantation investment can occur on a level playing field	▪ **Maintain policies that allow plantation development with detrimental environmental and/or social impacts**, causing conflict among private companies, communities and environmental groups
▪ **Develop strong research and extension support** for plantation development	▪ **Crowd out private-sector investment** in plantations by unnecessarily maintaining public-sector involvement, and especially do not grant public plantations privileges that prevent the private sector from competing
▪ **Establish strong industry clusters**, including supporting infrastructure, a competent labor force and appropriate practices and technologies	▪ **Keep policies and incentives in place longer than necessary**, keeping in mind that the most successful incentives are those that can be phased out
▪ **Collect and make readily available objective, high-quality resource information** to support policy making, forecasting, planning and monitoring	▪ **Retain bureaucratic procedures and other disincentives** that directly or indirectly reduce returns to investors
▪ **Encourage healthy debate and discussion** on the merits and reasons for offering particular incentives	
▪ **Establish monitoring and evaluation procedures** so that incentive programmes can be assessed	

Forest plantations can help meet increasing demands for wood and provide public goods and services, although in some cases they can also have negative social and environmental impacts. Also, appropriate incentives - particularly enabling incentives - can play a key role

in stimulating plantation development. However, there are two caveats that need to be considered. First, the forestry sector is not alone in requesting more support. The agricultural sector has its own advocates, and is often backed by generous incentives. Proponents of plantations need to recognize that alternative land uses may offer similar, or even greater, benefits to society, as well as more financially attractive returns. Under such circumstances it may be pointless to offer incentives for plantation development, since it may be more economically efficient to invest in alternative land uses, such as oil palm. While, this conclusion may be hard to swallow for representatives of the forestry sector, it is a reality that is taking place throughout the Asia–Pacific region.

The second caveat concerns the conventional belief that timber shortages will assure lucrative markets for wood indefinitely into the future. Recently, warnings of exactly the opposite scenario have emerged, suggesting a possible timber glut in the future (Adams 2002). If this proves true, promoting too many plantations now may result in a rude awakening further down the road for investors and those who encouraged them. In addition, skyrocketing freight costs reduce returns to investors or may turn wood buyers' interest to other locations, resulting in a local glut of wood that nobody wants.

A final observation from APFC's regional study is that, in a historical context, incentives have largely been applied in an *ad hoc* manner. As improved understanding of the mechanisms and conditions related to economic growth and development has evolved, it has become apparent that, in many instances, plantation incentives have been less successful than they might otherwise have been had various disincentives to plantation establishment also been addressed and had governments also directed their attention to creating enabling environments. Just as good physical site preparation is important for enhancing tree growth, so too is preparing a favorable policy and an administrative foundation is crucial for supporting successful plantation development.

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10 The UNCCD: A global framework for addressing sustainable forest management

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Abstract

This paper is a brief outline of the role of United Nations Convention to Combat Desertification (UNCCD), particularly with its linkage to sustainable forest management. Deforestation is a major driver of human-induced soil degradation. UNCCD's focus is on land rehabilitation, conservation, and sustainable management of land and water resources. Sustainable management of forests provides the synergy between UNCCD, CBD, UNFCCC and UNFF. The UNCCD pays particular attention to low forest cover countries, and advocates strengthening their capacity to combat desertification, land degradation and deforestation. The cross cutting-nature of UNCCD requires it to mobilize resources in a wide range of cross-sectoral areas. It is currently promoting the "Forest Landscape Restoration" (FLR) programme within the forestry sector. FLR seeks to balance biodiversity conservation with poverty alleviation and socio-economic needs to achieve sustainable development.

The UNCCD and forests

Land degradation, including desertification and deforestation, is a worldwide phenomenon which severely impacts poor communities in rural areas. Estimates show that drought and desertification threaten the livelihoods of over 1 billion people in more than 110 countries

around the world[35]. Thus, combating desertification is essential for achieving the broader objective of sustainable development in countries affected by drought and desertification.

Recognizing the linkages between poverty and environmental degradation, the UNCCD was established following the 1992 Earth Summit in Rio de Janeiro. The UNCCD is referred to as one of the Multi-lateral Environmental Agreements; however it is also recognized as a global framework for sustainable development. Designed as an overarching and cross-sectoral legal instrument, the UNCCD is therefore well positioned to support countries in achieving their national development goals and to contribute significantly to the Millennium Development Goals of reducing by half the number of people living in poverty by 2015 and ensuring environmental sustainability.

Deforestation is a major driver of human-induced soil degradation in the developing countries. Experiments on land clearing in the tropics have shown that deforestation leads directly to degradation of soil through changes in the chemical, biological and physical properties of soil, decreased porosity and infiltration rate, and compaction (Rydén 2001).

The provisions of the UNCCD focus on land rehabilitation, conservation, and sustainable management of land and water resources. It is acknowledged in the Convention text that desertification disturbs forest functions, in particular water cycling and soil protection. The role of forests in combating desertification is clearly recognized in the decisions of the Conference of the Parties to the UNCCD.

Conservation and sustainable management of forests have been identified by Parties of the UNCCD, Convention on Biological Diversity, the UN Framework Convention on Climate Change and the UN Forum on Forests as areas where synergetic action can be particularly effective.

The UNCCD pays particular attention to Low Forest Cover Countries (LFCCs), and advocates strengthening the capacity of LFCCs to combat desertification, land degradation and deforestation. Forests in low forest cover countries are, by definition, a scarce resource and therefore likely to be under greater pressure than those elsewhere. Given that aridity and drought are among the main causes of the reduction in the forest cover in LFCC's, common goals and objectives can be identified for the UNCCD and the LFCCs. Accordingly, in these countries, holistic and cross-sectoral participatory approaches to the development of national forest programmes and policies are highly relevant.

Multi-faceted approaches for sustainable forest management

As part of the solution to the problem of desertification, the Global Mechanism (GM) was established in 1998 under the authority of the Conference of the Parties of the UNCCD as an instrument to facilitate the rationalization of resource allocation and the mobilization of additional resources to combat land degradation and poverty.

[35] Message of Kofi A. Annan, United Nations Secretary General, on World Day to Combat Desertification 7 June 2001.

Summary of article forthcoming in FAO publication on "Cross-sectoral Policy linkages in the Forestry Sector"

The cross-cutting nature of the UNCCD mandates the GM to mobilize resources in a wide range of cross-sectoral areas. As donors increasingly align their priorities with those of recipient countries, articulating land degradation as a development priority becomes more important. The significance of domestic public budget allocations is increasing considerably through new approaches such as basket funding and direct public budget support. Given that national development frameworks such as Poverty Reduction Strategies often place strong emphasis on sectors such as education, public health and infrastructure, the UNCCD faces strong competition with these other development priorities.

Forest Landscape Restoration (FLR), as it is being developed within the forestry sector, is considered an effective approach for sustainable land management and an operational framework for the GM's cross-sectoral and integrated approach. FLR seeks to balance biodiversity conservation with poverty alleviation and socio-economic needs in order to achieve sustainable development, which inevitably entails negotiations and trade-offs between stakeholders at the landscape level (Aldrich *et al.* 2004).

A landscape perspective also allows the connectivity between systems on different scales to be addressed, including the link between local and global environmental benefits (GEF 2005). GEF's operational programs for sustainable land management and integrated ecosystem management, as well as operational programs of the biodiversity and climate change focal areas, can be useful tools for optimizing synergies between different sectors and mobilizing resources in support of the UNCCD and other relevant international agreements.

Moving from policy dialogue to effective action through the implementation of FLR at the local and national levels and across sectors could contribute to and enrich multilateral environmental agreements and policy processes (Saint-Laurent 2005).

Optimizing synergies at the national and local levels

Forest landscape restoration and sustainable land management require supportive national policy frameworks that provide incentives for long-term investment and acceptable returns. The challenges and constraints of implementing sustainable forest management at the national level coincide to a great extent with those posed by UNCCD implementation, such as integrating programmes into national development frameworks, the scarcity of financing, the weakness of institutional frameworks and insufficient interaction with other development sectors. The integration of sustainable land management practices into national development frameworks, such as Poverty Reduction Strategies, can facilitate the coordinated mobilization of funding for successful implementation of cost effective and sustainable programmes (GEF 2003).

To increase the resources allocated to sustainable land management, the Global Mechanism contributes to national policy processes, working with governments to mainstream sustainable land management issues into their development frameworks. Mainstreaming implies changes in the way of doing business; for instance through policy reform, institutional change, enhanced co-ordination arrangements, and planning/budgeting/resource allocation modalities.

At the core of the GM's resource mobilization strategy is the promotion of financing strategies that have proven successful in other sectors. Such financing strategies will

provide country partners with tools to align UNCCD priorities with those of other sectors and to compete for the allocation of resources in order to mobilize financial resources in a systematic, coherent and predictable manner. The strategies to be implemented under country leadership must be based on an analysis of the investment climate and identify financing instruments and sources of funding.

In an attempt to increase the involvement of local communities, the Global Mechanism and FLR promote local actions across sectors that create incentive mechanisms for rehabilitation of degraded landscapes. Recent studies indicate that environmental and social forces may not be sufficient to provide these incentives and that market and economic mechanisms should be a driving force for change (GM 2004; Hazell 2001). In this context, the development of community-based trade is viewed as a potential means to increase local participation in rehabilitation activities. This draws on the assumption that local communities and households are those ultimately responsible for the sustainable use and management of natural resources, and that their involvement in profit making activities through trade and business development would motivate them to increase investments in preserving these resources and restoring degraded ones.

Sustainability and equitable sharing of benefits among the various stakeholders at the landscape level still remains a major concern. If local producers could be compensated for part of the costs of replenishing their natural capital, the degradation processes could be reversed.

Benefit sharing could also be enhanced through compensation for ecosystem services. Forest ecosystems provide a number of ecological services which can serve as a potential platform for synergy: soil stabilization, biological diversity, carbon sequestration, water regulation, etc. While the value of the services provided by nature is being increasingly recognized, there still exists the challenge of mainstreaming them into existing markets. However, even in the absence of formal markets, these services are often valuable at the local, national and international levels and may serve as a fundamental mechanism for synergy.

All local actions are ultimately aimed at building synergies between local, national and international levels, and fostering political commitment by influencing policy making processes and related frameworks at national and international level. Local actions aim at triggering a process leading to mobilization of all types of resources – human, knowledge & information, instrumental and financial – at the different levels. For example, knowledge generated at the community level will have an impact on policy and decision making processes at national and international level. Policies will be adjusted and tailored to address constraints and opportunities identified at local/national level and contribute to establishing a more conducive environment for increasing investment and participation in sustainable land and natural resource management.

Conclusions

The close relation between land degradation and forestry demonstrates the potential for optimizing synergies between the UNCCD and forestry processes by adopting a holistic approach within the framework of sustainable development and poverty alleviation. Until these issues are addressed in a more integrated manner, it will be difficult to formulate and implement an optimal set of policies, practices and technologies, or to develop the most effective financing mechanisms. In line with the cross-cutting nature of the UNCCD, the

Global Mechanism advocates a multi-faceted approach to resource mobilization which broadens the scope of sustainable land management. This approach allows for greater flexibility in mobilizing additional resources for CCD implementation and increased opportunities for synergetic actions with a broad range of stakeholders.

Based on the GM experiences in resource mobilization, creating inter-linkages between various sectors is crucial for tapping into additional resources and for facilitating multi-stakeholders' engagement in UNCCD implementation. In order to effectively mobilize resources for the UNCCD, the Global Mechanism considers a landscape approach for its interventions and draws on various international, national and local processes for sustainable land management. It considers Forest Landscape Restoration an effective approach for optimizing synergies between relevant processes at all levels and facilitating multi-stakeholder engagement in land rehabilitation and restoration activities.

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11 Financing sustainable forest management: experiences in China

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Summary of the presentation

China, despite having more than 20% of the total global population, has forest cover of less than 5% of the world total. China is, however, fully aware of its obligations and potential roles in protection of global ecosystems and environment. Realizing that forests are a central part of the ecosystem and occupy an irreplaceable position in both the environment and developmental spheres, the Chinese government has introduced a package of political, legislative, and economic measures to promote sustainable forest management.

According to the recent National Forest Resource Inventory (2003), both the quantity and quality of China's forest resources have been much improved during the period 1998-2003. It showed that:

- Forest area is 174.9 million hectares, an increase of 15.9 million hectares, of which 43.7% are forest plantations;
- Forest cover has increased from 16.55% to 18.21%;
- Forest stocking volume per hectare is 84.73 m^3, an increase of 2.59 m^3 which has benefitted mainly from the Nature Forest Protection Program; and
- Percentage of forest managed for environmental degradation mitigation functions has increased from 20% to 41%.

Recently, positive investment policies in forestry have been implemented by the Chinese government. For example, over US$4 billion were allocated to the forest sector each year during 2003-2004 (Table 1). This has ensured the protection and development of forest resources, as well as motivating the active participation of all stakeholders. Reasons for investment increases in forestry are primarily as follows:

- High importance attached to forestry by the Central Government. The Government planned to promote ecological rehabilitation in order to mitigate natural calamities such as floods and desertification.
- To balance its wood supply-demand through increase in forest resources. China plans to be able to achieve self-sufficiency in wood supply.
- Improvement of the national economy.

Table 1. Investment to forest sector by Chinese Central Government

	1998	1999	2000	2001	2002	2003	2004
Billion Yuan (RMB)	7.25	9.59	15.28	17.32	27.85	34.68	37.58
Increase rate (%)	/	32.2	59.4	13.3	60.8	24.52	8.36

Note: 1 US$=8.02 Yuan (RMB)

During the period of 2001-2004, afforestation areas reached 27.44 million hectares, where 84% of the new plantations were afforested by the Six Key Forest Programs. Large areas of forest are effectively under protection or being restored; cropland on steep slopes and desertified lands have been converted into forest, shrub, or grassland. One of the key benefits of this is that water and soil erosion are better controlled in those regions.

The Six Key Forest Programs are as follows:

- Nature Forest Protection Program: under which 87.83 million hectares of natural forest have been protected or restored.
- Conversion of Cropland into Forest Program: 17.34 million hectares of new plantations have been afforested.
- Sandification Control Program: 2.19 million hectares of desertification-prone land converted to forest or shrub. According to a recent nationwide investigation, China's total desertificated land has decreased from 267.4 million hectares in 1999 to 263.6 million hectares in 2004, that is, an average of 758,500 hectares every year have been controlled.
- Key Shelterbelt Development Program in such regions as the Three-North and the Yangtze River Basin: 4.00 million hectares of planted areas have been achieved.
- Wildlife Conservation and Nature Reserves Development Program: has established 763 new natural reserves which accounts for 17.00 million hectares. Natural reserves have now reached 1,672 in number and the total area covers 119.0 million hectares or 12.4% of the territory.
- Forest Industrial Base Development Program in key regions with a focus on fast-growing and high-yielding timber plantations: 177,000 hectares of forest plantations have been established.

12 Poverty Reduction through Payment for Environmental Services: Issues and Questions[36]

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Abstract

The paper looks into the question of whether payment for environmental services (PES) can achieve both conservation and poverty alleviation goals. It does so by first developing a systematic framework to assess poverty and sustainable livelihoods. It then peers into how certain aspects of PES can address aspects of poverty. These include the influence PES would have on markets, financial, human and natural assets, and others. Among the questions raised are what is the income derived from PES, who are the beneficiaries, does it bring about employment, capacity building, etc. A working framework will be build along these broad outlines to address the specific questions. This preliminary report does not go beyond to answer whether PES can reduce poverty – that would be a subject of a future publication.

Introduction

Can payment for environmental services (PES) be effective in helping to achieve both conservation and poverty alleviation goals, and if so, how? In this paper, we explore this question by establishing a framework for thinking about the critical factors that might affect the poverty reduction potential of PES. Many existing analyses of PES and poverty raise a number of important issues and concerns, but lack a systematic framework based on a multi-dimensional concept of poverty. To develop such a framework, we draw on other approaches that have been used to assess poverty and sustainable livelihoods, and then analyze how certain aspects of PES can potentially address some components of these approaches.

[36] *Summary of paper under preparation for "Practicing PES in Asia: Can payments for environmental services be economically feasible and reduce poverty?" International Workshop to be held in Lombok, 25-26 January 2007.*

To understand whether PES can reduce poverty, we must first examine what PES is and how poverty can be assessed and reduced. First, we define how we understand PES in the context of this paper. We then take a look at approaches to assessing poverty and sustainable livelihoods, and examine specific factors to consider. We also analyze what aspects of PES are relevant to poverty alleviation. Finally, we set up a working framework to assess how such aspects of PES may impact poverty and sustainable livelihoods.

What is PES?

PES is often understood to consist of financial payments, such as user fees that the beneficiaries of environmental services pay to the providers of such services. PES in this sense can be defined as a voluntary transaction where a well-defined environmental service (ES) (or a land-use likely to secure that service) is being 'bought' by an (minimum of one) ES buyer from an (minimum of one) ES provider*,* if and only if the ES provider secures ES provision (conditionality) (Wunder 2005).

However, when we refer to PES in this paper, we are more broadly speaking of *compensation* for environmental services (which some refer to as CES). PES in this sense is defined as "compensation mechanisms that reward people for managing ecosystems and providing environmental services, and are based on the premise that positive incentives can lead to changes in land-use practices" (Frost & Bond 2006).

In addition to financial payments, this latter definition of PES includes *payment in kind*, such as infrastructure development or access to training, and *access to resources or markets*, such as land-use rights or access to new markets through certification (Wymann von Dach *et al.* 2004). The appropriateness of a broader definition will become clear when we discuss the non-financial dimensions of poverty in the following section.

How do we assess poverty?

Now that we have a definition of PES, we turn to the concept of poverty. What is poverty, and how do we assess it?

Traditionally, poverty was defined by financial deprivation, such as the World Bank's poverty benchmark of US$ 1 per capita per day to identify the poorest of the poor. Now, however, poverty is accepted to be multidimensional – not only as a lack of material income or financial assets, but also the lack of capabilities that enable a person to live the life that he/she values. As such, poverty is also characterized by deprivation in four other areas (Narayan 2000; Miranda *et al.* 2003; World Bank 2003):

- Human assets, including access to basic services like education, health and emergency assistance that will enable people to adapt to change and decrease vulnerability to financial or environmental shocks;
- Natural assets, encompassing access to natural resources needed to sustain life (e.g., food and water) and livelihoods;
- Social and political assets, such as access to social capital, ability to participate in decision-making processes and ability to trust in political institutions. These comprise critical social resources for people to function equitably as members of society; and
- Physical assets, including basic infrastructure such as sufficient housing, energy, transport systems and communications facilities.

A multidimensional approach recognizes that any improvement to financial assets will not be sustainable without corresponding improvements in access to the other four assets. In poverty assessment, Brocklesby & Hinshelwood (2001) also stress the importance of considering:

- social differentiation with respect to ownership, use and control over the physical environment and natural resources;
- how distribution of power in society shapes and determines use of natural resources and environmental services;
- seasonality, long-term environmental change and their social consequences; and
- spatial understanding of the environment and its various uses according to gender, age and occupation within and among communities.

Furthermore, we know that there is diversity amongst the poor, including the 'improving' poor, the 'coping' poor and the 'declining' poor. These groups respectively have a decreasing ability to access and effectively use the five asset types to improve their situation, which in turn increases their vulnerability to asset deprivation (Hobley 2005). Thus, poverty reduction strategies need to work with an understanding of the local population's access to the different asset bases, their level and causes of poverty, and how this impacts their resilience and vulnerability.

PES and poverty

With this understanding of the concept of poverty, we can now look at how PES might interact with the key factors affecting poverty. We are not the first to ask this question, and our work draws on a review of the existing literature on PES and poverty reduction.

Impacts on five key asset bases

Considering the five key asset bases, the deprivation of which characterizes poverty, we can conclude that the poverty reduction potential of any scheme largely depends on the impacts it has on these asset bases. As such, our analysis of the poverty reduction potential of PES must involve:

- Assessing impacts on financial assets: whether PES has brought about changes in income levels as well as income sources and whether these changes are sustainable;
- Assessing impacts on human assets: changes in expenditure patterns as well as changes to community health and access to education and information;
- Assessing impacts on natural assets: issues regarding the security of resource access and use and the changes in the value of the resource;
- Assessing impacts on socio-political assets will revolve around two umbrella issues – social structures and processes, and institutional arrangements. Social structures and processes deal with both internal and external relationships in communities, while institutional arrangements refer to decision making structures and processes, and the shifts in power and representation of the poor (Hobley 2005); and
- Assessing impacts on physical assets: whether PES improves access to basic infrastructure such as housing, water supply, energy, transportation and communications, which increase the ability of a community to expand their livelihoods and decrease their dependence on local resources.

Since many PES projects in Asia involve some level of common property management or community management of natural resources, it is not surprising that the framework presented above is consistent with other established criteria and indicators for assessing community management of forests and related livelihood initiatives. For example, the Center for International Forestry Research (CIFOR) emphasizes an integrated approach in assessing community forest management. And the sustainable livelihood approach (SLA), promoted for some years by the United Kingdom Department for International Development (DFID), recognizes that livelihood strategies need to include multiple components in the form of access to financial, human, natural, social/political and physical assets (Chambers & Conway 1992; Ritchie *et al*. 2000; Miranda *et al*. 2003; Grieg-Gran *et al.* 2005; Carney n.d).

Other issues

A number of key issues that play a potentially crucial role in the capacity of PES to address poverty have been highlighted including uncertain property rights, poor information flow and communication, high coordination costs and weak political voice, all of which can diminish access by the poor to PES schemes (Landell-Mills & Porras 2002). For example, if PES is open only to landholders, this immediately restricts the potential for PES to benefit many of the rural poor, who do not have secure title to land. By considering the factors that limit the creation of markets and who among the poor can gain access to the potential benefits, we can form a picture of the poverty alleviation potential of PES schemes.

In addressing this critical issue of access to PES schemes, it is important to recognize the differences between those from the locality who participate in PES and those who do not, as well as their reasons for non-participation. With this in mind, barriers to participation by those excluded from the program, but who have potentially valid stakes in the management of the natural resource, can be identified, as well as the impacts of PES initiatives on the neighboring communities. Many assessments focus only on the potential sellers and buyers. However, a more holistic approach can provide a clearer view of equity considerations in the distribution of costs and benefits (Grieg-Gran *et al*. 2005).

Based on the experiences from community-based natural resource management, it is also important to consider the relative emphasis on environmental and social outcomes. By examining potential compromises or trade-offs between social/equity/poverty benefits and environmental objectives, informed decisions can be made on balancing the impacts of PES implementation. There may be cases where environmental and social goals are mutually reinforcing, in that they are both concerned with the efficient and sustainable use of resources. In other situations, for example where resource use is restricted, trade-offs may be necessary.

Key questions in examining the poverty reduction potential of PES

The various issues presented above lead us to a working framework that can help us to analyze the poverty reduction potential of PES schemes in Asia.

Table 1. Framework for analyzing poverty reduction potential of PES

FACTOR	KEY QUESTIONS AND ISSUES
Market Development and PES Design	• Is there a market for the environmental services being delivered? (i.e., are service users willing to pay for the service?) • Who participates? (What are the criteria and processes used to identify sellers?) • What is the relative importance of environmental and poverty reduction goals in the PES scheme? Are these goals compatible or are trade-offs required?
Financial Assets	• Who is gaining income from PES? Has the scheme increased the overall income in the households? • Is the PES scheme a source of employment? • Are income sources sustained for PES participants? • Is the PES scheme contributing to increases in the cost of living?
Human Assets	• How are the funds used at the community and household level? (e.g. education, investment, consumables) • Is the PES scheme contributing to improvements in capacity, skills and knowledge, and for whom?
Natural Assets	• Has there been change in the security of access to resources? (i.e., property rights) • Have land use patterns and practices changed? • Has the status/value of natural resources improved?
Social and Political Assets	• Has the PES initiative influenced the participants' ability to cooperate and network? • Is there a change in the likelihood or incidence of conflict resulting from PES? • Is PES-related decision-making transparent and accountable? • Does PES involve the formation of new organizations? What is their role in PES and more widely? • Has PES increased local engagement in and/or influence on wider decision making processes (e.g. policy, land-use)?
Physical Assets	• Has PES stimulated investment in local infrastructure? (e.g., safe housing, adequate water supply, energy, transportation and communications facilities)

Adapted from Ritchie et al. 2000; Chambers & Conway 1992; Grieg-Gran et al. 2005; Miranda et al. 2003; Landell-Mills & Porras 2002; Wymann von Dach et al. 2004).

The questions presented in this working framework will be elaborated and refined as more evidence on the relationships between PES and poverty emerges. They provide a starting point to assess existing PES schemes for their impacts on poverty and raise issues to consider in designing PES. In using this framework, however, some important questions remain. Do we need to address all of the presented issues for a PES scheme to be poverty

reducing? Are some factors more important than others? These are questions that are not addressed in the current framework, and should be considered and hopefully answered as we accumulate more PES experiences.

Conclusion

By presenting the multiple dimensions of poverty, we argue for an integrated approach to reducing poverty that goes beyond providing financial benefits for the poor. The working framework presented here outlines a broad set of issues and questions of potential concern if PES is to contribute to poverty reduction in this wider sense. What is not answered here is whether PES can meet these requirements, a question we are interested in further exploring. A review of Asian experiences in the forthcoming workshop, "Practicing PES in Asia: Can payments for environmental services be economically feasible and reduce poverty?" will build on the efforts to date in reviewing current experiences and the potential to address poverty through PES

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