VI

Assessment of the contribution of forestry to poverty alleviation in Lao People's Democratic Republic

Phouthone Sophathilath*

Introduction

Lao's People's Democratic Republic (Lao PDR) is a landlocked country located in central Indochina. The country shares borders with China to the north, Myanmar in the northwest, Thailand to the west, Cambodia to the South, and Viet Nam to the east.

Lao PDR has a total land area of 23.7 million ha, 70 percent of which is mountainous. There are three agro-climatic zones in the country: the mountainous north; the hilly to mountainous regions in the central and south; and the alluvial river plains along the Mekong and its tributaries in the central and southern parts of the country.

In 2009, the country's total population was estimated at 6.38 million, with a population growth of approximately 2.3 percent per annum. The Lao population comprises 49 official ethnic groups of some 200 sub-ethnic groups, and around 73 percent of them live in rural areas in which livelihoods rely on forest resources.

Forest situation and forest policy

Being a landlocked mountainous country, Lao PDR is well-endowed with natural resources that can make a major contribution to the country's long-term economic development. The most important of these resources are forests, agricultural lands, hydroelectric potential, and minerals. In particular, the Lao forests are rich in species with a high degree of endemism and biological distinction[1]. In 2010, forest cover was estimated at 40.3 percent of the total land area (approximately 9.5 million ha) (DOF 2010). This is considered to be among the highest forest cover in the Southeast Asian region.

However, Lao PDR experienced a notable deforestation rate in the last two decades. Forest area decreased dramatically with an estimated forest loss of about 134,000 ha per annum or about 0.6 percent of the total land area (DOF 2002). Deforestation took place mostly in the north, where arable lands are limited and where most people practice shifting cultivation. If this deforestation rate continues, the Lao forest area will decrease to 7.4 million ha (approximately 31.3 percent of the total land) by 2020.In addition to decrease in area, changes also occurred in stocking density, species composition, forest structure, and decrease in wildlife and plant population.

There are external and internal factors causing deforestation in Lao PDR. External factors include increasing market demand for Lao timber and NWFP in the region, partly resulting from logging bans

* National Agriculture and Forestry Research Institute (NAFRI), Lao PDR.

[1] According to MAF, FS 2020, there are at least 8,100 plant species, 166 reptile and amphibian species, 700 bird species, and 100 mammal species identified in Lao PDR.

in neighboring countries that increase pressure on the Lao forests. Internal factors, on the other hand, include shifting cultivation practices, unsustainable logging, land conversion to commercial plantations, hydropower development, and mining. More recently, deforestation in Lao PDR has been intensified by careless land concessions for domestic and foreign direct investments in natural resource-based sectors, particularly commercial plantations, hydropower electricity generation, and mining.

In the Lao policy, deforestation has been recognized as a serious threat to the sustainable socio-economic development of the country. The Government of Lao PDR (GoL) has spent a lot of effort in placing Lao forests under sustainable management. This includes the development and testing of various sustainable forest management models and improvement of forest policy and related legal framework. The participation of local people in forest management, protection, and conservation has been strongly promoted. These policy directions have been finally translated into the Forest Strategy toward 2020 (FS 2020) adopted by the GoL in 2005. The strategy consolidates the government's visions and related policies for the sustainable development in the forestry sector and specifies the important role of forestry development in economic growth, poverty reduction, environmental and biodiversity conservation, and mitigation of global climate change.

In FS2020, the GoL envisages to increase forest cover to reach 70 percent of the total land area by 2020, of which the production forest (PDF) accounts for around 13 percent, the conservation forest (NBCA) around 20 percent, and the protection forest (PTF) around 35 percent. In addition, forest plantations are expected to contribute 2 percent or around 500,000 ha. The key strategies set for forest recovery include natural regeneration, sustainable forest management, and the promotion of forest plantations. In June 2011, the GoL adopted the 7th NSEDP (2011-2015) that targets an increase in forest cover to 65 percent by 2015.

To date, 51 PDF areas covering a total area of around 3.1 million ha (about 13 percent of total land area) have been demarcated throughout the country. All these PDFs are to be put under the Participatory Sustainable Forest Management System (PSFMS)[2] developed and implemented by DoF with support from the Sustainable Forestry for Rural Development (SUFORD) project. The PSFMS has so far been implemented in 16 out of 51 PDFs covering 42 percent of the total demarcated PDF areas (DOF 2010a). Out of these PDFs, six sub-PDFs covering almost 82,000 ha have been certified by Smart Wood using the Forest Stewardship Council (FSC) criteria. Further expansion of certified forest areas is planned in the future (Ibid.). By doing so, GoL expects to maximize the value of Lao timber when trading with international markets. But due to a number of limitations, not much in premium benefits have been obtained from the effort so far.

In addition, PTFs covering a total area of around eight million ha are to be established. This forest type is particularly important for the protection of watersheds, especially in the uplands. However, the establishment and management of PTFs in Lao PDR are currently in an initial stage. No specific strategy and plans yet have been prepared for the establishment and management of PTFs. Efforts so far have been concentrated on boundary delineation on maps and preparation of governing regulations. In 2010, 308 protection forest areas covering around six million ha were in the process of boundary demarcation, 180 of which were officially approved by relevant provincial authorities. No groundwork has started yet.

Finally, 23 NBCAs have been established with a total area of about 4.4 million ha (approximately 19 percent of total land area) (DoF 2010). These forests are managed under two management systems: the "Participatory Protected Area Management System" and the "Participatory Conservation and Development."[3] In spite of a lot of efforts to develop management models and build associated capacity, the management of NBCAs in Lao PDR is still in an early stage and faces a number of limitations

[2] PSFMS is a forest management system developed for the management of PDFs with full participation of respective villagers in planning, operation, and benefit sharing in accordance to prescribed rules and regulations.

[3] The two management systems both involve local people in the planning and management of NBCAs, but the difference between them is that in ICAD, rural development activities are integrated in the management system.

and obstacles. Some key issues include, for instance, unplanned village settlements, unclear NBCA boundaries, pressure from exploitation, encroachment and large-scale development projects[4], inadequate institutional arrangements, lack of knowledge and experience, lack of funds, and other concerns.

Economic situation

In terms of economy, Lao PDR is currently in the transition period, moving towards a market economy. In general, the economy has performed relatively well in recent years in spite of the global financial crisis. Currently, Lao PDR belongs to the top 10 countries that improved their human development index (HDI) and ranks 122nd out of 169 countries listed (UNDP 2010). The gross domestic product (GDP) shows a steady growth of about 7.9 percent per annum in the last five years and it is projected to continue growing steadily in the future.

Within the total growth, the agriculture sector grew on average at 4.1 percent, with a 30.4 percent share in the GDP; the industry sector at 12.5 percent with 26 percent share; and the service sector grew at 8.4 percent with 37.2 percent share. The rest was accounted for by indirect taxes (Report on the High Level Round Table Meeting 2010).

The economic growth in Lao PDR has been extensively attributed to external demand and massive inflows of foreign direct investment (FDI) from neighboring countries, particularly China and Viet Nam. During the period from 2000 to 2009, the FDI in Lao PDR accounted for US$12.2 billion, out of which 34 percent went to electricity generation, 26 percent to mining, 12 percent to service, 9 percent to agriculture, 8 percent to industry and handicraft, and 11 percent to the other sectors (PEI 2010). The number of approved and implemented projects gradually rose. In 2009 alone, 208 projects were approved and implemented, valued at approximately US$4.3 billion of FDI.

Table VI.1. Poverty and literacy rates of populations affected by hydro & mining investments in Lao PDR

	Hydro: planned (with MOU)*	Within 1 hour's walk of current/planned hydro**	Mining: exploitation stage	Mining: exploration /general survey***
Villages	293	255	36	1,225
Population	104,962	112,256	19,082	568,370
Poverty Rate	47%	42%	37%	40%
Literacy rate	60%	69%	46%	40%

* Based on 42/81 hydro projects,"planned" include under construction, planning or feasibility study
**Excluding population within the inundated area, based on 42/81 hydro projects
***Rough average of projects in exploration or general survey stage

Source: Fenton et al, 2010 in Lao PDR Development Report 2010. Background Paper. Social Impact Mitigation from Hydropower and Mining in Lao PDR: Examining Potential for Benefit-Sharing Approaches.

The investments are mostly concentrated on resource sectors such as hydropower electricity generation, mining and agriculture, particularly commercial plantations (Ibid.). The majority of these projects are located in remote rural areas where poverty incidence is high. Table VI.1 above depicts examples of the characteristics of affected populations from hydro and mining investments in Lao PDR.

In general, Lao PDR has achieved a rapid economic growth that drives development. However, the GoL has recognized that the growth does not reflect sustainable development because it is mainly derived from the exploitation and export of natural resources (Report of the Lao President to the IX Party Congress 2011). Increasing demand for the country's abundant natural resources will further accelerate the pace of exploitation of these resources, frequently without adequate measures to prevent or mitigate their adverse impacts.

[4] Large-scale development projects that challenge NBCAs include hydro-power development, mining, and industrial agriculture production, and plantations.

Poverty situation

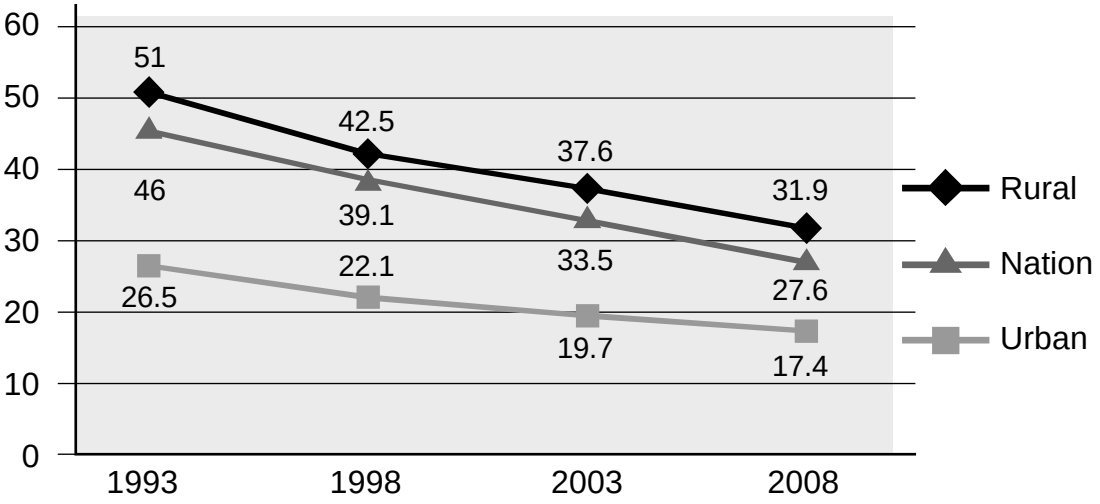
Despite the significant economic growth, Lao PDR remains a country with much poverty. Poverty in Lao PDR is defined as "the lack of ability to fulfill basic human needs such as not having enough food, lacking adequate clothing, not having permanent housing and lacking access to health, education and transportation services" (NGPES 2004).

Poverty in Lao PDR has a strong geographic dimension. Poverty incidence registers higher in the uplands as compared to lowlands. In particular, it appears highest in the southwestern region of the country, particularly along the Vietnamese border.

In general, there is a big poverty gap between rural and urban areas, as depicted in Figure VI.1.That the average national poverty line is very close to the average rural poverty line indicates that the highest poverty incidence remains in rural areas.

For concentrating poverty eradication schemes, the GoL identifies 72 districts as poor and a core group of the 47 poorest districts has been selected for priority investments. All identified districts are located in remote and mostly forest areas.

Figure VI.1. Poverty trend in Lao PDR



Source: Draft 7th NSEDP of Lao PDR.

To tackle the problem, the GoL is strongly committed to achieve the MDGs and targets set in its National Growth and Poverty Eradication Strategy (NGPES)[5]. The strategy set the targets for stable economic growth at 7.5 percent and the population living under the international poverty line to 24 percent by 2015. The strategy was elaborated and translated into the 6th National Socio-economic Development Plan (NSEDP), which was implemented during the period 2006-2010. The 6th NSEDP considered agriculture and forestry, transport, health, and education as priority sectors for poverty eradication.

The implementation of the 6th NSEDP resulted in a rapid economic growth and a satisfactory poverty reduction rate. For instance, in this period GDP per capita increased from US$491 (2005) to US$1,069 (2010) and the poverty headcount ratio was reduced from 33.5 percent to 26 percent in the same period (Report on the High Level Round Table Meeting 2010). The positive trend of poverty reduction in Lao PDR is also shown in Figure VI.1.

In spite of the rapid economic growth, there is a big poverty gap between rural and urban areas. In 2010, more than 73 percent of the total population still lived in rural, marginalized areas (Ibid.). These people are heavily dependent on forests for their livelihoods, and the majority of them practice shifting cultivation. According to Lao policy, this practice is one of the main causes of deforestation and must be eradicated.

[5] NGPES was developed and adopted by GoL in 2004 to guide poverty eradication in the nation.

To continue reducing poverty, the GoL adopted its 7th NSEDP in the 6th National Assembly Meeting held 9 to 24 June 2011. In the 7th NSEDP (2011-2015), GoL targets an increased annual per capita income of US$1,700 by 2015 and a stable annual GDP growth at 8 percent. Out of the total GDP, the agriculture and forestry sectors are expected to contribute 23 percent, the industry sector 39 percent, and the service sector 38 percent. The poverty headcount ratio is targeted to be brought down to 24 percent (Draft 7th NSEDP of Lao PDR 2010). Another forestry-related target in the 7th NSEDP is to increase forest coverage to 65 percent of the country's total area by 2015.

Poverty eradication and forestry in national policy

The highest poverty incidence in Lao PDR is found in rural areas, where around 73 percent of the total population reside. These people are dependent on natural resources, especially forest resources for survival. Thus, forests and poverty are interrelated, and sustainable forest management and utilization are essential for poverty alleviation.

In the national policy, the GoL recognizes that forest resources are essential for poverty eradication. It is clearly spelt out in one of the NGPES strategic objectives *"maintaining a healthy and productive forest cover as an integral part of the rural livelihood system, and generating a sustainable stream of forest products"* (NGPES 2004). To materialize the objective, sustainable forest management is one of the four development goals of the Agriculture and Forestry Development Strategy towards 2020 *'Sustainable forest management for preserving biodiversity, improving national forest cover, providing valuable environmental services and fair benefits'*(Draft MAF Agriculture Development Strategy 2020).

In addition, forests are recognized as one of the most important environmental resources, which play an important role in the poverty-environment nexus, particularly in the interrelationship between economic growth, poverty eradication, and environmental degradation. It is also noted in the national policy that deforestation will most likely accelerate poverty in rural areas, where most of the poor inhabit, and cause unsustainable economic development in natural resource-based sectors such as mining and hydropower development, and environmental degradation, which in turn affects economic growth and exacerbates the poverty situation.

In reaction, the GoL through the Poverty-Environment Initiative (PEI)[6] has conducted a number of social and environmental impact studies of the development in key sectors with potential negative impact on the forest and its natural resources, including forest resources. These include, for instance, impacts related to FDI such as land concessions, commercial plantations, mining, hydropower development, bio-energy development, and others. Findings and recommendations for inclusive and sustainable development have been streamlined into the planning process, especially in the preparation of the 7th NSEDP.

Contribution of forests to poverty alleviation

Forests have an important role to play in the national economy and are central to poverty alleviation, especially for rural people. For poverty alleviation in particular, Oksanen (2003) has grouped contributions from forests into five categories: (i) income generation, (ii) subsistence, (iii) energy, (iv) agriculture and rural development, and (v) governance.

In general, it is recognized that forests provide a significant contribution to poverty eradication, but to what extent, especially at the household level, is hard to quantify and is not recorded in national statistics. The following sections describe examples of forest contributions to poverty alleviation. Knowing that it is difficult to quantify indirect contribution of forest to poverty alleviation, discussion hereunder focuses on direct contributions in different aspects.

[6] A program that aims to mainstream poverty and environmental issues into national level planning and development processes to ensure that the country's rapid economic growth generates inclusive and sustainable development, supported by UNDP and UNEP.

Subsistence use of forests and allocation of tenure over forest land and resources

Almost all the Lao population living in rural areas is heavily dependent on forests for their subsistence, income generation, energy, and agriculture and rural development. Because it is difficult to distinguish whether forest products are collected for food, for income generation, or for other subsistence uses, the following sections will discuss the traditional contributions of forest resources as categorized into two dimensions, namely the contribution of NWFPs as food and income sources, and timber as fuel wood and subsistence materials.

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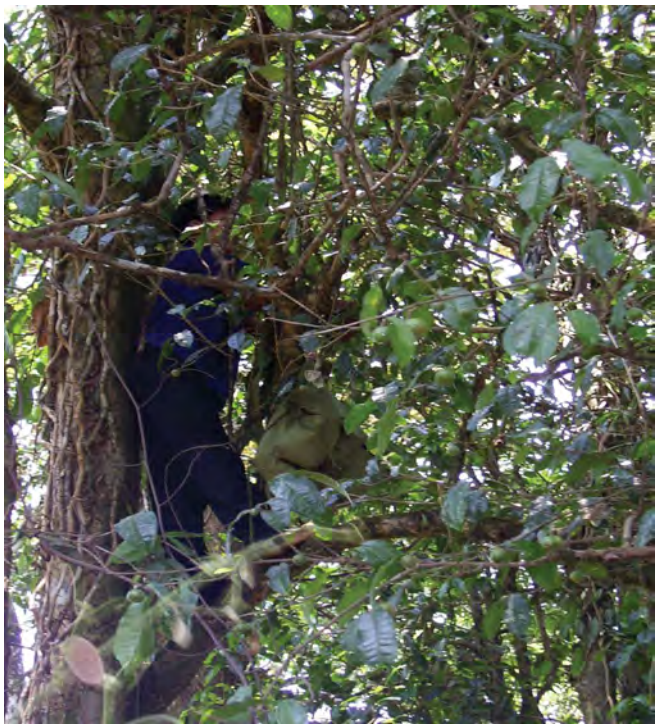
Wild tea and mushrooms are some of the NWFPs collected and sold in open markets.



NWFPs as food and income sources

In Lao PDR, NWFPs are diverse and accessible to all Lao citizens, regardless of ethnicity, gender, wealth classes, and living conditions. NWFP collection is a traditional subsidiary livelihood activity for rural forest-dependent people, who mainly practice shifting cultivation. These people collect NWFPs mainly for food and additional income generation.

For poverty eradication, NWFPs are recognized as an important natural resource in the policy of the Lao Government, especially in the NGPES. In this context, NWFPs are the main sources of food, income, medicines, and other subsistence items. Living within and closer to forest areas, rural people have greater advantages in being able to benefit from NWFPs as compared with urban people. They are the main collectors, even if they sell these for urban consumption and commercial trading.

The true extent of NWFPS contribution is hard to quantify, but roughly estimated, on the average, NWFPs are worth a total of almost US$320 per year for each rural household, contributing to about 44 percent of subsistence value, 55 percent of cash income, or 46 percent of the total household economy.[7]

As a food source, over 700 NWFP species in the forests (238 plant species and 470 animal species) are

[7] Clearing-House Mechanism, http://chm.aseanbiodiversity.org

identified as edible (Baird et al. 1999 cited in Foppes and Ketphanh 2000). Wild plant species such as mushrooms, bamboo shoots, wild fruits, vegetables, and honey, for instance, provide a wide range of food products for consumption. According to Emerton, contribution from wild food has been estimated to be 61-79 percent of non-rice food consumption by weight and to provide an average of 4 percent of energy intake, 40 percent of calcium, 25 percent of iron, and 40 percent of vitamins A and C. They are also commonly used as buffers against seasonal and emergency food shortages (Emerton 2005).

Besides, NWFPs are also important income sources in rural areas. In many locations, NWFPs are also widely collected for sale in open markets. For cash income, national studies found out that the average sales of NWFPs on the national level are worth 11 percent of poor household cash incomes, but rise as high as 55 percent in forest-rich areas. For example, a survey carried out in Houapanh Province found that NWFPs contributed an average of 38 percent of village cash income, and up to 56 percent for household living within and adjacent to forests.[8] The case studies conducted in Khammouane (Foppes and Ketphanh 2000), Sayabouly (Foppes et al. 2001), Luang Phrabang (Yokoyama 2003) and Sekong (Rosales et al. 2003) discovered that NWFPs provide an average annual income in a range of US$69-127, averaging 45 percent of family cash income.

Many studies also revealed that local people use income from NWFPs to pay back debts associated with rice shortage. The case study in Luang Nam Tha, for instance, showed that income from NWFPs contributes an average 61 percent of cash income or around US$60 per family per year that households need in order to pay back debt associated with rice shortages (Kaufmann 1997).

In addition, NWFPs serve as materials for household construction and handicraft production including bamboo, rattan, pandanus, broom grass, and paper mulberry. They are also the ingredients of traditional medicines and are also used for livestock fodder and pasture. It is also important to note that NWFPs can be an important incentive for forest conservation, given that the forest is the main source of NWFPs, which are important food and income sources for local people, especially shifting cultivators.

However, these resources are rapidly declining in recent years, especially the species found in dense forests. Important factors associated with this negative trend are over-harvesting, shifting cultivation, forest fire, animal damage, lack of management regulation, and damage from infrastructure development. The decline will continue and may lead to complete loss of NWFPs (and extinction of some species) given that NWFP domestication cannot meet the demand and market demand is high (Sophathilath 2006). The continuous decline of NWFPs can increase the challenge for poverty reduction in forest-dependent areas.

Many efforts have been made to sustainably and effectively manage natural NWFPs. The case study carried out by this author shows the successful case from the intervention of NWFPs Sustainable Management Project carried jointly by IUCN-NAFRI in Ban Nam Pheng, Oudomxay Province.

Fuelwood and other materials for subsistence

Another important aspect of forest contribution to poverty alleviation is providing energy sources, especially for fuelwood and charcoal. Fuelwood is an essential energy source for the rural poor where there are no other alternatives. It was estimated that fuelwood accounts for 80 percent of total energy consumption in Lao PDR, and 92 percent of total households in the country use fuelwood for cooking and heating.[9] In addition, fuelwood and charcoal are often traded for urban consumption, from which the poor can benefit in terms of additional income and employment.

In Lao PDR, fuelwood collection is part of the Lao culture, especially for people living in rural areas. Thus, collecting fuelwood for household consumption, so long as it is not for business purposes, is allowed in all categories of natural forests. Fuelwood collection is allowed by law in village forest areas allocated for communities to manage and utilize. Rural people, who practice swidden cultivation, often

[8] Clearing-House Mechanism, http://chm.aseanbiodiversity.org

[9] MEM Renewable Energy Strategy.

collect fuelwood from their newly-cleared upland rice areas. Many also get their fuelwood from fallow lands. Some also collect from dense forests near their villages.

Because there is no national record on fuelwood consumption, the author used the estimates obtained from the website of Clean House Biodiversity to describe the fuelwood situation. According to the source, data on the quantity of fuelwood used in rural areas of Lao PDR show extreme degrees of variation ranging from 0.75-2.92 cu m or 0.58-2.26 tonnes per capita per year. Thus, a conservative average per capita consumption of 1.2 tonnes[10] per capita per year was used for further estimation. According to the same source, consumption of fuelwood and charcoal by urban dwellers has been estimated at 42,146 tonnes or 280,973 cu m per year, and firewood demand for fuelwood consuming processing industries at 111,118 tonnes or 143,468 cu m per year. Applying current prices, household and commercial fuelwood consumption has a total annual value of approximately Lao kip (LAK) 45.75 billion, which is equivalent to US$45.7 million for the use of more than 5.6 million tonnes or almost 7.5 million cu m of raw wood a year.

Given the figure, it can be said that forests are essential and provide substantial values to rural people whose livelihoods heavily depend on forests. The GoL has promoted and invested in a number of bio-energy schemes such as biogas and rural electricity networks that could be good alternatives to and replacements for fuelwood at certain levels. However, since fuel wood consumption is already rooted in Lao culture and development of other alternatives is at a slow pace, fuelwood will remain an important energy source for the rural poor.

Commercial and industrial forestry

Commercial forestry is understood as the use of forest products and forest lands for commercial purposes. There are many types of activities that can be put under commercial forestry. As examples, four different types of activities are used by the author to discuss their contributions to poverty alleviation in this section. These include contributions from commercial plantations, contributions from the management of production forests, contributions from wood products and wood processing, and contributions from forest-induced environmental services.

Commercial forest plantations

Undertaking commercial forest plantations is one of the key strategies for the GoL to meet its targeted forest cover set in its Forest Strategy 2020. In the strategy, the GoL anticipates an increase in the coverage of industrial tree plantations up to 500,000 ha (MAF 2020). To fulfill the objective, the GoL has strongly promoted domestic and foreign investment in forest plantations.

As a result of the promotion, the investment in commercial plantations increased sharply during 2004 to 2006, mostly through large-scale FDI in the form of land concessions. In 2007, over 109 foreign

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Monocrop plantations.

[10] This is a conservative estimate for rural households in the Lower Mekong Region.

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The expansion of rubber, eucalyptus and other monocrop plantations in vast land concessions, mostly under large-scale foreign investments, is drawing attention to the social and economic costs for the local communities and harmful environmental impacts.

companies received business licenses in the plantation sector (MPI 2007) and 123 plantation projects worth almost US$0.7 billion were approved.[11] In terms of area, plantations increased from around 5,000 ha in 1990 to 165,800 ha in 2007 (NERI). The most recent national record is unfortunately not accessible. The most favorable tree species for commercial plantations in Lao PDR were rubber, eucalyptus, acacia, teak, agar wood, and jatropha.

In recent years there was a rubber boom in Lao PDR. Areas planted with rubber skyrocketed from approximately 27,000 ha in 2007 to 140,550 ha in 2008, and 195,000 ha in 2010, as a result of FDIs from China and Viet Nam. These mostly occurred in the northern and southern parts of the country (NAFRI 2008). MAF projected that rubber areas would increase to 300,000 ha by the year 2020 (MAF 2009).

Companies from China have large investments in rubber plantations mostly in the northern region near the Chinese border, while Vietnamese companies are located in the southern region. The Chinese investments are mainly in the form of contract farming; the Vietnamese, on the other hand, mainly have used the concession model.

Besides rubber, foreign companies have also invested in eucalyptus plantations. The largest investor is the Japanese pulp and paper giant Oji Paper, which received a land concession of 50,000 ha in the central region and applied for another 30,000 ha in the southern part of the country. Another large-scale investor is Grassim-Birla Group of India. This company also received a 50,000-ha concession in the central region. More recently, the Finnish pulp and paper giant Stora Enso received 35,000 ha concession for planting eucalyptus in the southern region.

There has also been a substantial investment in jatropha feedstock cultivation with a total planned investment of approximately US$50 million (Gaillard 2010). In this area, the largest companies, Kolao Farm and Bio-energy Company, have announced an investment of US$30 million for producing 400 million liters of biodiesel for domestic uses. However, the actual scale of the developed plantation and the status of the planted jatropha are still uncertain. By 2020, the land area to be covered by jatropha cultivation is expected to reach 167,000 ha with a total seed production of about 250,000 tonnes per year (Gaillard et al. 2010).

In terms of investment models, three main models apply in the plantation sector in Lao PDR, namely the *Smallholder Farming Model, Contract Farming Model*, and the *Concession Model.*

Besides contributing to the fulfillment of the forest cover target of the FS 2020, the commercial plantation is also perceived to bring about many social and economic benefits in terms of economic growth, increased per capita income, improved standards of living, and poverty reduction. The following

[11] These figures do not include plantation projects with investments lower than US$ 3 million approved by provincial and districts authorities and those established by smallholders.

discusses whether or not plantations contribute to poverty alleviation. In particular, the discussion will compare benefits and possible negative impacts of the three different investment models.

Smallholder farming model

This investment model is commonly used for teak, rubber and agarwood. Individual farmers who have sufficient land and capital and can wait for the long-term benefits of this model. These farmers mostly belong to middle-class or wealthy groups.

Experiences show that investment in these plantations take a minimum of eight to 15 years to receive returns (eight years for rubber and agar wood and 15 years for teak). For rubber, an eight-year rubber tree produces 1,360 kg of latex per hectare for a profit of around US$880 (NAFRI 2008) with a tapping period until the trees reach 35 years of age.

Famers who invest in teak plantations have to wait at least 15 years for financial returns, given that there is no market for small wood from the first and second thinning. Once the teak trees mature (in 15 years) for harvest, teak farmers receive an average of 15 cu m per hectare valued at US$1.5 per hectare in 15 years or about US$100 per hectare per year.[12] There have been cases, wherein famers have sold their young plantations to investors at prices ranging from US$700 to US$2,000, depending on the location and the ages of the trees. These farmers, after selling their plantations, often seek lands in other places, often in forests, to cultivate rice.

The investment in agar wood plantation, on the other hand, is very costly, compared to the investments in teak and rubber. The total cost is estimated at about US$4,200 per hectare in eight years with an establishment cost of about US$1,950 per hectare (Sengdala 2010). In terms of income generation, about US$17,000 per ha can be made from selling wood (about 58 tonnes per ha) with a net profit of around US$12,800 per ha in eight years or US$1,600 per ha per year. Profits can also be made from extracting oil estimated at US$8,500 per ha (Ibid.).

Contract farming model

Investors who obtain no large land concessions usually use this model. This model, particularly the '2+3 model' has been strongly promoted by the GoL and widely used in both perennial and short duration crop plantations in different parts of the country, such as rubber plantations in Northern Laos, maize in Louangnamtha, soybean in Oudomxay, sweet corn in Vientiane, horticulture in Bokeo, and tea in Phongsaly (Setboonsarng et al. 2008).

This model is considered as the most appropriate in the transition period while moving from a subsistence to a market economy. Under this model, external investors bring with them technology, capital, and market access to rural areas. In exchange, farmers have better access to promising technology, sufficient inputs and credit, and an assured market for their produce that enables them to earn higher profits. This translates into improved incomes and an effective transformation from subsistence to commercial production with no financial burden upon the public sector. This suggests that contract farming can be an effective private-sector-led mechanism to facilitate the transition to commercial agriculture. In addition to bringing FDI into the rural sector, contract farming can be an effective tool to improve the profitability and raise the incomes of small farmers, thereby reducing poverty in rural areas with limited market development.

In addition, while involved in the contract, farmers have full rights in land ownership. Thus the model secures land tenure for farmers. The model also introduces a fair benefit-sharing system. Additional benefits that farmers can gain from this model are the ability to intercrop seasonal crops such as rice and corn in perennial plantations such as rubber. This can be done in the first three years before the plantation's canopy closure.

[12] Price at farm gate US$ 100 per cu m cited in Midglay et al. 2006.

Concession model

This model is widely used for rubber, jatropha, eucalyptus, and acacia species in central and southern Laos. The investments under this model are mostly in large-scale monoculture and have expanded rapidly in recent years as a result of the strong government promotion coupled with careless authorizations of land concessions. A rapid increase of this type of plantation may be positive for the government's targets in forest coverage and increased investment flows, their potential contribution to rural development, and replacement of shifting cultivation. However, as mistakes have occurred in recent years, these perceived benefits are increasingly being weighed against negative social and environmental costs.

Among the negative environment impacts is that the large amount of land required for the monoculture industrial plantations have caused the clearance of natural forests in many places. The clearance of forests, such as the 3,000 ha for coconut plantations in Bolikhamxay province from 2004 to 2006 is a relevant example (PEI Lao PDR 2010). In addition, large-scale industrial plantations under this model tend to exacerbate poverty for poor farmers. Rubber plantations invested in by Vietnamese companies in Lao Gnam and Bachieng Districts, southern Laos show clear examples of negative socio-economic impacts. In particular, the investments have resulted in decreased landholdings, food production, and household incomes. In this respect, a recent study (Leonard 2008) reveals that from 2005 to 2007, villagers lost their productive lands at nearly 2.8 ha per household and about half of households interviewed households are now landless (n=210). As a consequence, crops grown by each household have generally declined. Furthermore, upland rice production in all villages has steadily fallen and the number of households with rice sufficiency has also fallen sharply.

In comparison, the small-scale forest plantation appears to contribute less to the national economy but provide more benefits to poor people. For farmers who can afford to engage in long-term investments, both the smallholder farming model and contract farming model are appropriate. However, in economic terms, the smallholder farming model can be most appropriate for the rich farmer who has land, capital, knowledge, and market access.

The contract farming model is most likely suitable to poor and middle-class farmers who can make land available and have labor, but who lack the capital and knowhow and who have no market access. Under this model, in addition to shared benefits in monetary form, involved farmers can benefit from enhancing their own associated skills either in the technical or managerial aspects. The model is considered as the best plantation model that contributes to poverty alleviation and promotes commercial production in rural areas.

In contrast, large-scale investments such as the concession model, if well-managed, can contribute to the growth of the national economy and per capita income, but not necessarily to poverty alleviation for poor farmers. Under this model, benefits at the local level, especially for poor people, are considered minimal. In contrast, it has a high tendency to exacerbate poverty and create negative social and environmental impacts such as land loss, forest loss, insecure food security and social tension.

Contribution of PSFM of production forests

By law, commercial logging in Lao PDR is permitted only in PDFs with approved sustainable forest management plans prepared in line with PSFMS developed and applied by SUFORD. As discussed in Section 1.2, there are 51 PDFs in the country. Currently SUFORD works in 16 PDFs, covering a total area of approximately 1.3 million ha located within the boundaries of more than 700 villages. The SUFORD model is intended to expand in all 51 PDFS in the future.

There are two ways through which SUFORD interventions contribute to poverty alleviation: (i) through the distribution of village development grants; and (ii) through timber revenue-sharing with village communities.

As of September 2010, Village Development Committees were established in 304 villages with 119 out

of 311 villages (38 percent) preparing their village development plans (VDPs) with technical assistance from project staff. SUFORD provided a grant worth US$8,000 per village to support the implementation of the VDPs, following specific guidelines: US$3,000 for infrastructure development linked to livelihood improvement activities and US$5,000 for a revolving loan fund from which individuals or groups can borrow for investing in their livelihood alternatives.

In November 2010, SUFORD conducted an assessment on the impact of the village grant and found that impact was small mainly due to limited resources provided by SUFORD and insufficient technical support to the scheme. However, an improved situation is foreseen with increasing local awareness and capacity-building. Although SUFORD is about to phase out at the end of 2011, the Finnish Government has shown enough interest to take on the effort. A feasibility study was carried out mid-2011 and the new project is expected to launch at the beginning of 2013. For the transition period, DoF has already requested the World Bank to extend the use of the remaining IDA fund. In addition, another recent qualitative study conducted by SUFORD (Clarke and Puustjärvi 2010) revealed that many investments were profitable and brought benefits to the community or individuals.

While applying PFMS, a sustainable level of revenue from timber is expected to contribute to the growth of the national economy as well as to poverty reduction in rural areas, especially in villages located in and surrounding production forest areas. In this connection, SUFORD estimated that net revenue from timber can be generated, ranging from US$4.5 to 14.5 million per year once the entire PDF system is in productive use. Using the existing benefit-sharing system, wherein 25 percent from timber revenues is shared with the respective villages as Village Development Funds (VDF), every year around US$1.1-3.6 million can be made available for village development activities and thereby contribute to poverty alleviation.[13] However, the actual gains from forest revenue are very low and deemed insufficient to help village development. The income from timber is low because the designated forests have already been overharvested and very limited timber remains for logging. This also contributes to high logging costs.

According to SUFORD, the timber revenue made available to villagers in the current situation is modest, with an average revenue of US$261 per village per year. The highest revenues were received by villages in Savannakhet and Khammouane, with an annual average of US$680 and US$191 per village, respectively. In contrast, in Salavan and Champassak, the annual average revenue was low, at only US$28 and US$33 per village.

In addition, considerable and sustainable revenue from NWFPs from production forests if managed with PSFMS can be expected. It was estimated that a potential annual cash income of US$17 million per year and non-cash income of about US$49 million per year can be gained in the SUFORD PFAs. After deducting costs, the net cash income from the NWFP collection can be estimated at about US$15 million per year and is much higher compared to the net timber revenue for the SUFORD PFAs estimated at US$1.8-5.4 million per year.

Another possible income option that can be made available for poverty reduction is carbon revenue, as long as deforestation is halted as a consequence of PSFM in SUFORD areas. With the assumption of a carbon credit price of US$5 per ton, SUFORD has estimated the potential revenue from carbon revenue from production forests at US$10 million per year. But at this level, carbon funding alone may not be sufficient to compensate the foregone benefits for farmers. Additional funding sources or higher carbon credit prices are needed.

Finally, villagers can also gain income from SUFORD in the form of wages when participating in the implementation of the SUFORD project. While implementing project activities at the grassroots level, SUFORD has also hired casual labor from villagers so they can gain additional income for improving their livelihoods. There are a number of activities: forest inventory, forest rehabilitation,

[13] From the net revenue, 50% goes to royalty at central level, 25% goes to Forest Development Fund (PAFO), and the other 25% goes to villagers through the Village Development Fund.

land use planning, logging operations, and capacity building that villagers can take part in during the implementation. Daily wages range from LAK 25,000 to 50,000 per day. For example, from January 2009 to June 2010, SUFORD paid labor service to villagers who were involved in the activities a total amount of more than LAK 750 million for 5,568 working days. Given that SUFORD is working in more than 700 villages throughout the country where thousands of people live, the payment is considered minimal and only a small number of villagers can access the benefits.

Wood processing and wood products

As a consequence of the log export bans in1990, the GoL has promoted downstream processing and the export of finished or semi-finished wood products. This has led to the growth of the wood-processing industry. However, being in an early stage of development, wood processing in Lao PDR has been deemed inefficient, having low recovery rates and generating low-value products. To reverse the situation, the GoL has instituted a reform of the wood industry to promote efficiency and final products processing and export.

In August 2007, 326 of 587 sawmills and secondary processing factories were closed, 185 were recommended for improvement within one year, and only 76 were allowed to continue operations. Of 1,528 furniture factories, 1,188 were closed, 212 were recommended for improvement within one year, and only 128 were allowed to continue operations.

Meanwhile, the private sector has formed the Lao Wood Processing Industry Association, the main objective of which is to facilitate the allocation of government timber quotas to individual factories. The association is expected to play key roles in technology upgrading and skills improvement, marketing cooperation, and promotion of the use of timber from sustainably-managed forest areas. The association also collects chain of custody (CoC) certification information in relation to the processing and export of certified wood.

The wood-processing sector in Lao PDR is foreseen to make an important contribution to both the national economy and employment in the country. To the national economy, it contributes approximately 6 percent of the GDP and 32 percent of the manufacturing production value (MAF 2005), but no official national record is available regarding employment.

In the 1990s, wood and wood products accounted for 40 percent of export earnings, almost half of which were from the export of logs. The total value of wood and wood products exports reached US$67-75 million in financial year 2001-2002 and increased to US$97 million in 2005-2006, as a result of the additional wood supply obtained from the clearing at the site of the Nam Theun 2 Dam (NT2) and the plantation program (Sayakoummane and Manivong 2007).

In addition, the wood industry also contributes to the household economy. A recent study conducted in 48 forest-based enterprises from Vientiane and Savannakhet Province reveals that the average direct earning (salary) for an employee working in forest-processing enterprises is US$105 per month or about US$1, 270 per year. Compared to the average individual income in the country, especially of those working in the governmental sector (US$30-100 per month), the average salary paid by factories is relatively higher. Apart from salaries, employees also received non-salary incomes such as overtime payment, annual bonus, and compensation for hospitalization costs. They are also granted factory waste. According to the survey, the majority of respondents appeared to be satisfied with the paid income, with only 19 percent reported as not satisfied (NAFRI/FRC 2006).

Payment for environmental services

To date, four main environmental services identified have been addressed by PES—watershed services, carbon sequestration, landscape beauty, and biodiversity conservation. In Lao PDR, like in other developing countries where environmental governance is not yet effectively addressed, PES is a very new concept and is not yet well understood by the majority of the people. Although the government has recently recognized the importance of PES in sustainable socio-economic development and poverty alleviation and has taken it as a key policy objective, the use of PES schemes is not widely practiced. It is implemented as project-specific in nature and lacks consistency in its application.

Due to the above-mentioned limitations, the following sections discuss examples of contributions of PES through the forest environmental services to the national economy as well as to poverty alleviation. For the discussion, possible contributions from ecotourism and from the REDD initiative are presented as examples.

Ecotourism

Tourism in Lao PDR is closely linked to natural forests and culture. It is one of 11 priority sectors to support national socio-economic development. It is seen as one of the country's major engines of economic growth and poverty alleviation. The overall tourism sector objective is centered on poverty alleviation.

Since 1990s, the tourism sector has developed very fast. Tourist arrivals have increased significantly in the last 20 years. The number of arrivals skyrocketed from 14,400 in 1990 to 737,000 in 2000 (Manivong and Sophathilath 2006) and reached 2.5 million in 2010[14] and around 66 percent are interested in forest-based ecotourism (FBE) (Schipani and Marris 2002). FBE has high potential in Lao PDR, because the country has a large conservation forest system that makes a wide variety of ecotourism activities possible. In some conservation forests, ecotourism activities are already integrated into biodiversity conservation and management, with an orientation towards raising awareness about conservation. Tourism is a powerful globalizing force and if well-managed, can have a direct positive effect on the national economy and poverty alleviation (Schipani 2000b).

Foreign exchange earnings from tourism showed a steady increase, with total earnings of about US$97 million in 1999, US$113 million in 2002, and US$119 million in 2004 (LNTA 2004a). In 2010, tourism ranked third in terms of foreign exchange earnings, producing US$360 million (LNTA 2007c). Of the total income from tourism, around 45 percent was estimated to come from nature and culture-based tourism (LNTA 2004b). The Lao tourism industry is also a major employer, generating some 17,000 jobs nationwide. Indirect employment provided by the sector was estimated at around 167,000 people (LNTA 2007).

REDD plus initiatives

Lao PDR is ranked 12th among the top 20 tropical countries that have the potential to store carbon while also protecting globally important biodiversity (Peskett et al. 2008b). It is in a good position to capture benefits from the REDD mechanism. Although REDD is new to the country, it is strongly believed to reconcile economic development, forestry, and climate change and ultimately contribute to poverty alleviation (Manivong 2008).

Recently, Lao PDR was selected as one of 25 participating countries in the World Bank Forest Carbon Partnership Facility. Its Readiness Plan Idea Notes (R-PIN) was approved in October 2008 and the country received a Readiness Fund. Preparatory activities for readiness to implement the REDD program are being implemented, such as the REDD strategy formulation, coordination and consultation; development of a national REDD mechanism; carbon assessment pilots; and REDD demonstration (Sawatvong 2010).

[14] LNTA press released February 8, 2011 on http://vientianemai.net/teen/khao/1/1993

Phouthone Sophathilath

The Nam Ha conservation forest boasts of thick forests, rich biodiversity and cultural tradition and breathtaking landscapes. The National Ecotourism Strategy and Action Plan aims to promote poverty alleviation and strengthen biodiversity management in protected areas. Part of the entrance fees collected from tourists visiting Nam Tha conservation forest is invested in programs for improving local livelihoods, particularly those related to ecotourism in the area, and providing alternative sources of income.

REDD is considered to give great opportunities for a participating country's economic development, sustainable forest management, environment protection, and poverty reduction. For the poor, REDD is expected to provide both income and non-income gains. Income gains from participating in the implementation of REDD can be derived from payments made through the Carbon Finance Mechanism, which is intended to provide incentives for stakeholders, including local peoples and the private sector, so as to achieve long-term sustainability in REDD projects. The extent of possible incomes generated by the rural poor from REDD is too early to estimate. However, experiences from other countries show that poor people who participate in environmental service schemes similar to REDD are generally better-off, or at least not worse-off (Wunder 2008). Non-income gains, on the other hand, may include increases in human and social capital and higher visibility vis-à-vis external investors (Wunder 2008 in Biddulph 2009).

In addition, it is believed that REDD can be a good incentive for tackling deforestation because it gives actual financial values to standing trees rather than logging trees and clearing land. But the success of the REDD program implementation, particularly when payment is based on performance, will depend on three factors. One is the amount or level of compensation. If it is too low compared to opportunity costs or program implementation costs, governments or participants will lose interest in REDD. Second is the fairness or attribution issue. The REDD payment systems need to be designed in such a way that people or organizations who have actually contributed to reduction in deforestation, are paid commensurate to their contributions. Third is the initial costs of REDD programs, which seem to be very large. A mechanism to pay for part of these costs from future REDD payments may need to be developed (Lao R-PIN 2008).

Other concerns were raised in a recent study. It revealed that the contribution of REDD to sustainable development in Lao PDR is uncertain since the REDD scheme will have implications on national forests on which the livelihoods of the majority of Lao people in rural areas heavily depend. In this connection, it was argued that success would depend on the ability to address challenges related to the rights of local people over their resources, the creation of exclusionary conservation forests, fair benefit-sharing, corruption status, and top-down policy (Sivirath n.d.).

If these challenges are addressed at an early stage, then REDD policies might offer opportunities for local communities to derive benefits. It is also important that local communities become fully involved in the REDD policies (Griffiths 2007 in Sirivath n.d.). In addition, the rights of local people will need to be adequately respected, land titling provided, and foregone benefits adequately compensated. All these concerns and challenges have been well-recognized by the GoL since the preparation of the Lao R-PIN and measures to address these have been proposed in the respective R-Plan.

National case studies

To supplement the literature review, three country case studies on contributions from forest and forestry to poverty reduction have been carried out for this country study. The first study seeks to understand the contribution from NWFPs with organized marketing groups in Ban Nampheng, Odomxay Province. The second deals with the contribution from production forests through the Participatory Sustainable Forest Management (PSFM) in Ban Xom, Khammouan Province, and the third has been conducted to show the contributions from the compensation to forest services paid back by the NT2 hydroelectric plant to forest conservation and rural development in 31 villages in Nakai Namtheun NBCA (NN-NBCA).

Table VI.2. Background information on the case study sites

Study site	Area of forestry considered	District/poverty ranking out of 45 poorest districts	Social services
Ban Nampheng	Organized NWFP marketing	Namo (38)	• Accessible year round • Engine generated electricity • 1 health care station • 1 primary school • Poor water supply
Ban Xom	PSFM in PDF	Xebangfai (not belonging to the 45 poorest districts)	• Accessible year round • Engine generated electricity • 1 health care station • 1 primary school • Poor water supply
31villages in Nakai Namtheun NBCA	PES through Forest Services	Nakai (46) Khamkeut (26)	• Difficult to access during the rainy seasons • No electricity • Primary schools in few villages • Health care stations in each village cluster

Case study 1: contribution of NWFPs to poverty reduction: the case of Ban Nampheng, Oudomxay province

Background

From 1995 to 2001, the National Agriculture and Forestry Research Institute (NAFRI) and the World Conservation Union jointly implemented a NWFP project designed as an Integrated Conservation and Development Project. The project aimed to develop and pilot sustainable NWFP utilization systems that contribute to forest and biodiversity conservation and address poverty issues. It hoped to achieve these objectives by removing poverty-related factors that drive over-exploitation of NWFPs by local people, empowering local people to better control the access and use of forests by outsiders, and organizing local people through institutional building.

To meet these objectives, the project helped the village organize an NWFP marketing group for marketing bitter bamboo shoots collected by villagers in the village forests. All villagers who collected bitter bamboo shoots for sale were allowed to join the group. A Group Committee headed by the village chief with one-person units for monitoring, accounting and trade managed the group. All decisions were made collectively in meetings chaired by the Group Committee. After the success with bitter bamboo, the marketing group organized a similar regime for cardamom.

As part of the management regime, the marketing group set the dates for harvesting season each year, based on the natural characteristics and regenerative capacity of the NWFP, with the NWFP project assisting villagers in the form of ecological information and training. The harvesting season for bitter bamboo for sale usually lasted about 4.5 months between December and April. However, collection for consumption was permitted throughout the year.

All households involved in collecting NWFPs sell the collected products directly to the Group Committee, who then sells on a larger scale to traders. The benefit sharing system agreed upon by the members allows the individual collectors to take 85-90 percent of the final sale, while the remaining 10-15 percent is put in an NWFP Fund. The fund is used to support community projects (e.g., purchase of an electric generator), community services (e.g., provide loans), and pay the salaries of the monitoring, accounting and trade units. The marketing group collectively decides on the use of the fund and salary levels.

This case study aims to examine the contribution of NWFPs to poverty reduction in Ban Nampheng where an NWFP marketing group was organized to enhance local empowerment efforts. Discussions in this case study are based on the assessment of Jason Morris conducted in 2002. Updated information was gathered during a field survey for this case study where the village committee and 30 individual households were randomly selected and interviewed in April 2011.

Ban Nampheng: background information

Ban Nampheng is one of the poor villages in Namo District of Oudomxay Province. Ban Nampheng has a total forest area of 2,490 ha, out of which over 500 ha is covered by bitter bamboo. In 2011, there were 368 people in the village belonging to 89 households. All of them belong to the Kmou ethnic group, and almost all are farmers. Like the other poor Lao villages, Ban Nampheng has limited social services such as electricity, road access, and educational and health care services.

Because the village is located in a mountainous area, the paddy field areas are limited, specifically only 20.3 ha. About one third (29 percent) of the households practice shifting cultivation, 7 percent cultivate lowland rice, and 64 percent do both. Almost all households raise small additional incomes. Domestic animals, especially large animals such as cattle and buffalo, are assets held for household safety. NWFP collection is an important occupation for additional income-generation and is practiced by all households.

Although there are limited paddy areas in the village, the villagers have sufficient rice supplies for

consumption because shifting cultivation is widely practiced. In a participatory wealth-ranking with the village committee, it was found out that majority of households (70 percent) are self-sufficient, 18 percent are better-off, and 12 percent are still classified as poor.

NWFPs are an important income source in the village. All households in the village are involved in NWFP collection and are members of the NWFP marketing group. Previously, villagers sold their collected NWFPs separately with lower and unstable prices. Through their marketing group, villagers are now equipped with higher bargaining power with external traders and therefore can sell their products at higher prices.

In general, NWFP collection in Ban Nampheng is the task of women and children. Not a single man was reported to be involved in NWFP collection from the interviewed households. On average, a household collects NWFPs 116 times per year. From the total collection, around 80 percent are sold to the Village Marketing Committee, while the rest are used for household consumption and for other traditional exchanges or given as gifts. The average annual income from NWFPs per household is about LAK 1.6 million (US$200) or about 31 percent of total income. The income was ranked third after rice and other combined agriculture products. It would have been interesting to compare average earnings from NWFPs prior to and after the establishment of the NWFP marketing group, but it was impossible to do so because of the absence of baseline information.

Five NWFP species were identified as economically important, including bitter bamboo shoots, broom grass, red mushroom, cardamom, and Meuak bark. While bamboo shoots are directly used for food, red mushroom, and cardamom for medicine, the use of broom grass and Meuak bark is not clearly known, except for the broom grass that is used for making local brooms. Their ranks of importance are illustrated in Table VI.3.

Table VI.3. Economic ranking of NWFPs in Ban Nampheng

NWFP	Ranking	Collected volume	Price	Natural availability
Bitter bamboo shoot	1	Increased	Stable	Increased
Broom grass	2	Stable	Down	Increased
Red mushroom	3	Decreased	Down	Decreased
Cardamom	4	Decreased	Down	Decreased
Meuak bark	5	Stable	Stable	Decreased

Source: Field survey.

As seen from the table above, bitter bamboo shoots and broom grass are most important for household cash incomes because of resource availability, even though the price for broom grass has gone down.

Phouthone Sophathilath

Bitter bamboo is a major source of income for majority of the households in Ban Nam Pheng. Establishing a sustainable harvesting regime is critical to sustaining this economic benefit. Organized selling of bamboo shoots by the women allows them to earn more for their collected products.

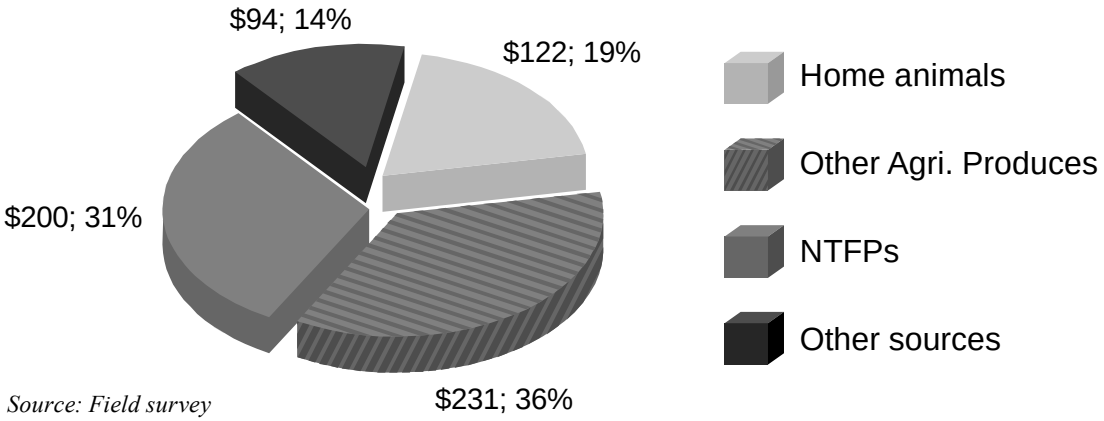
Many important NWFP species are reported as having declined in quantity, except for bamboo shoots and broom grass that can grow in open forests and fallow lands. Three underlying causes are reported to contribute to this negative trend: (i) over-harvesting; (ii) poor management; and (iii) shifting cultivation.

No clear solution was reported by the villagers to address these resource concerns. They proposed that PAFO and DAFO assist them in completing the land-use planning and land allocation in their villages and in updating the existing related regulations. Domestication of NWFPs, especially cardamom, was introduced by the NWFP project during its implementation phase but was not scaled up. Villagers reported that prices dropped in the Chinese market in the mid-2000s, discouraging scaling-up.

Contribution to poverty reduction

Recognizing the importance of NWFP in poverty alleviation, the following sections discuss in more detail how NWFPs contribute to poverty alleviation through the four areas in Figure VI.2.

Figure VI.2. Contribution of NWFPs to household cash income



Source: Field survey

As discussed above, NWFPs rank third in the total household economy, after rice and other combined agriculture products. However, since local farmers are reluctant to sell rice, cash income from NWFPs ranks second to agriculture products, but comparatively higher than those from home animals and other sources. On average, it covers 31 percent of the total household cash income or around US$200 per year.

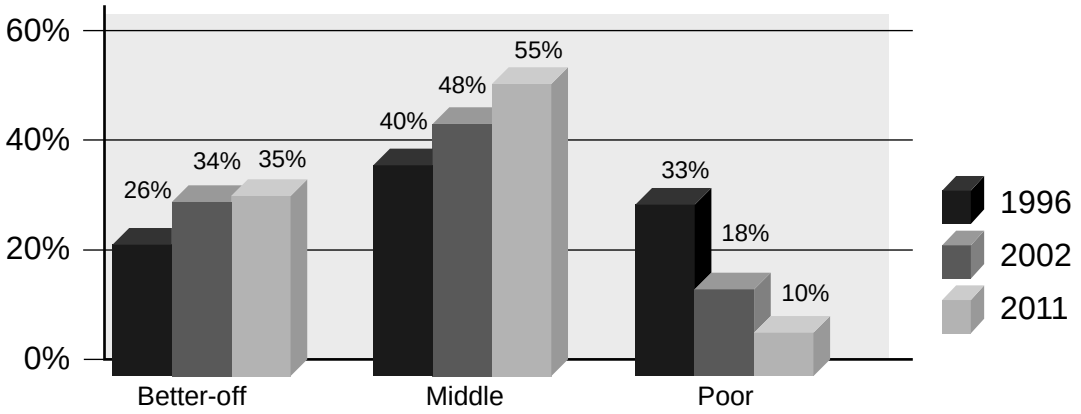
The contribution of NWFPs to the whole household cash income in this case study (31 percent) is relatively lower than the estimated share by Morris in 2002 (40 percent). This is primarily due to the increased share of new emerging income sources as a result of the introduction of new cash crops for Chinese markets since the mid-2000s. However, if compared only with the net income from NWFPs, there is an increase.

Indirectly, the income increase from the new emerging sources can be considered as NWFP contributions, since many villagers borrowed money from the NWFP-grounded Village Development Fund (VDF) for investing in new income alternatives. In addition, using the VDF for improving village infrastructure, such as road access, will enable market access into the village.

Contribution from NWFPs to increased wealth and reduced poverty

Using wealth ranking as one way to measure changes in poverty, the village members were categorized in three classes: better-off, middle-class, and poor households. Two related wealth rankings were conducted in 1996 and 2002 as part of the impact assessment from NAFRI-IUCN NWFP project on poverty reduction. Using similar criteria and method, the third wealth ranking was conducted during the field survey in April 2011.

Figure VI.3. Wealth ranking at three different times



Source: Field surveys

Figure VI.3 compares wealth rankings at three different time periods during and after the implementation of the NWFP project. It illustrates that within the time period from 1996 to 2011, people in the village, in general, have been getting wealthier. This can be seen from the steady increase in percentage of better-off and middle-class households and a steady decrease in the percentage of poor households. Within 15 years, the percentage of better-off households increased from 26 percent to 35 percent, middle-class households from 40 percent to 55 percent, while the percentage of poor households decreased from 33 percent to 10 percent only.

The results from wealth rankings cannot be used solely to measure the impact of NWFP contribution to poverty reduction in Nampheng village. However, since income gained from NWFPs is significant to the household economy, it can illustrate the indicative contribution from NWFPs.

Contribution from NWFPs to improved infrastructure and services and other benefits

About 70 percent of the income of NWFP collectors are considered resource taxes and were put in the VDF. The remaining 30 percent was used to pay salaries for people in the marketing group. The fund was set up in 1999 and since then, the village used the fund to purchase one electric generator for the village, build a new village office and a village food and storage house, and renovate the school building. The village also used the fund to pay the teacher's salary at their school. Part of the money was also used as credits for private investments. Currently Ban Nampheng has savings ofLAK30 million (approximately US$3,750) in the VDF.

In addition to these tangible improvements, there are other indirect benefits that villagers gained from the initiatives. For examples, through the formation of the NWFP marketing group, villagers were organized and empowered, and had more confidence in dealing with traders and other villages. Secondly, through technical assistance from the project, villagers acquired skills, such as improved harvesting techniques, marketing and business skills, and knowledge of ecology, which they used in managing and marketing their NWFPs. Finally, villagers reported to have improved their capacity to manage natural resources. The introduction of Land Use Planning/Land Allocation (LUP/LA) and the development of participatory NWFP harvesting regulations, for instance, restricted upland cultivation and illegal NWFP harvests with a system for punishing offenders and authority to deal with conflicts.

Villagers' concerns

Villagers also expressed concerns on how to sustainably manage their bitter bamboo forests. In particular they fear that their forests could be easily encroached by the increasing foreign investment since the LUP/LA[15] is still not complete in the village. In addition, a weak legal framework and law enforcement can exacerbate their situation. Thus, they request the government, particularly PAFO and DAFO or relevant projects, to help them address these concerns.

[15] LUP/LA is land use zoning and planning at the village level introduced by the GoL in the mid-1990s. It was seen as a tool to stop shifting cultivation and forest encroachment. However, due to a number of limitations, this was not further implemented and will be replaced by the newly developed "Participatory Land Use Planning at Village and Village Cluster Level".

Case study 2: contribution of PSFMS to poverty reduction: the case of SUFORD in Ban Xom, Khammouane province

Background

Lao PDR started to develop and pilot PSFMS for production forests in the mid-1990s through the FOMACOP[16]. The system was then further developed and expanded by SUFORD[17], known also as the successor of FOMACOP.

Fully implemented in late 2005, SUFORD will phase out by the end of 2012. The main project beneficiaries are the villagers who live inside and around the production forests. These people receive benefits to reduce poverty not only through village development activities and forest-based livelihood development, but also from building their capacities and empowering them to more effectively address the causes of their poverty. Benefits expected from the implementation of SUFORD include:

1. village development and forest-based livelihood development;
2. development of skills and empowerment of the villagers to address their own poverty;
3. sustainable supply of forest resources, both wood and non-wood forest products, for subsistence use and cash sale; and
4. provision of environmental services to protect water sources and enhance agricultural productivity.

Currently, SUFORD works in 16 out of the country's 51 PDFs located within the boundaries of more than 700 villages. Ban Xom, the site of this case study, is one of them.

This case study intends to examine the benefits of implementing in Ban Xom, Khamouane Province the PSFMS introduced by SUFORD in the earlier stage of the project. Due to a number of limitations, the discussion in this study is mainly based on secondary information from the SUFORD Project. In addition, information gathered from a field visit to Ban Xom was used to supplement the secondary data.

A brief about Ban Xom

Ban Xom is located at Sebangfai District, Khamouane Province. The village has a total population of 532, in 128 households. The village is located in one of the PDFs where SUFORD has operated from the start. All the people living in the village belong to the Phouthai ethnic group, which practices paddy rice cultivation as a main occupation (Figure VI.4). Livestock, cash crops, and NWFPs are important additional income sources in the village. People in the village also generate income from wages paid by SUFORD for carrying out project activities. Ban Xom is not located in one of the 45 poorest districts identified by the GoL, but the people in the village are poor. Of the total number of households, 15 households were reported as having income surplus, 78 households are self-sufficient, and 15 households face food shortages. On average, rice is sufficient for 10 months during the year.

Project interventions

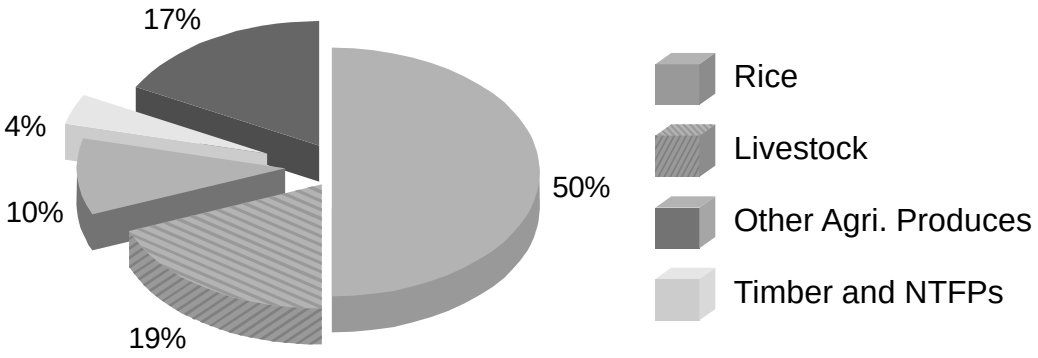
Since the village participated in the implementation of SUFORD, the village received LAK68 million (US$8,500) from timber sales as shared revenues from the participation in the PSFMS with the government. This revenue was put into the VDF and managed by the village committee. Utilization of the fund was authorized by a village agreement. The village also received a grant amounting to

[16] A forestry program co-funded by the World Bank, the Finnish Government, and the GoL was implemented by DoF from 1995-2000 in Savannakhet and Khammouane Provinces.

[17] A multilateral cooperation project between the GoL, Finland, and the World Bank to assist GoL to improve forest policy, legal and incentive framework to expand PSFM throughout the country; bring the country's PDF areas under PSFM; and improve villagers' livelihoods through benefits from sustainable forestry, community development and development of viable livelihood systems.

LAK66.9 million (US$8,360) from the project as a Rural Development Fund. The fund was to be used as a village revolving fund to support income generation activities.

Figure VI.4. Income distribution in Xom village 2011



Source: Field survey May 2011

Out of the grant, LAK63 million (US$7,800) was given as loans to six production groups comprising 40 households. (Details of the distribution are illustrated in Table VI.4 below.) These production groups were established with technical assistance from project staff in terms of technical and managerial skills development. The main purpose of the grant fund was to increase and diversify incomes for forest-dependent households, especially for those with less opportunities to receive direct benefits from forest management.

Table VI.4. Rural development fund and beneficiaries

Activities	Amount (LAK)	Number of households
Expanding rice paddy field	15,000,000	10
Cattle raising	20,000,000	10
Goat raising	10,000,000	5
Chicken raising	8,000,000	8
Fish raising	5,000,000	2
Small scale trading	5,000,000	5
Total	63,000,000	40

Source: Field survey, May 2011.

Income from labor service in forest management activities is considered minimal since most of the forest management activities have been carried out at the stage of forest management planning, already completed during the time of FOMACOP.

Of the 30 interviewees, only two individuals were reported to be involved in forest inventory, especially in clearing survey lines for pre-harvesting inventory, and they received LAK 20,000 (US$2.5) per day as wages. One of them received LAK 2.5 million (US$312), while the other received LAK 200,000 (US$25) only.

Contributions to poverty reduction

In the field survey at village and household levels, almost all interviewees reported that the SUFORD intervention improved their livelihoods and living conditions. As shown in Table VI.5, all interviewees agreed that their incomes increased as a result of the introduction of new livelihood alternatives. The increased income was also attributed to the grant provided by the project for rural development activities, such as the access road and electricity network.

Table VI.5. Villagers' opinions on benefits from SUFORD

Conditions	Percentage of respondents, n=30			Contributions from SUFORD
	Improved	Un-changed	Worsened	
Improved income	100%	0%	0%	RDF diversified income alternatives, and involved in forest activities
Improved electricity	100%	0%	0%	One electricity transformation unit purchased by VDF
Improved education	100%	0%	0%	New school built with financial support from SUFORD (60%) and villagers contributed (40%)
Improved water supply	27%	73%	0%	Needs improvement
Improved road	100%	0%	0%	Used VDF gained from timber revenues to improve village tracks and the main road to the village
Improved health	100%	0%	0%	New health station at the village cluster level is using VDF from respective villages
Average	88%	12%	0%	

Source: Field survey, May 2011.

Education and health conditions were also positively reported and attributed to the construction of a new school and health care station from forest revenues. However, villagers are facing difficulties in water supply, a main concern of villagers.

In addition to livelihood improvement, villagers observed improved management capacity. This was considered to have been a result of village capacity-building and local empowerment activities by SUFORD and brought about the daily improvement of resource management. For example, villagers reported that previous land-use conflicts between villages or within the village were minimized as village management capacity improved.

Improvements were also reported in terms of minimized illegal logging and shifting cultivation practices as villagers were actively involved in the management of PDFs from which they shared benefits. As a consequence, forest conditions improved. Finally, the majority of interviewees reported that they had no problem in terms of their freedom to use the forest in accordance with their customary rights.

Table VI.6. Villagers' opinion on benefits from SUFORD

Conditions	Percentage of respondents, n=30			Contributions from SUFORD
	Improved	Unchanged	Worsened	
Land use conflict	100%	0%	0%	Clear boundaries resulted from sustainable forest planning practices and village agreements
Village management capacity	100%	0%	0%	Technical and managerial skills enhanced
Illegal logging	100%	0%	0%	Increased forest ownership of PDFs in village boundaries improved forest management and control of illegal practices
Stabilized shifting cultivation	83%	17%	0%	Improved forest ownership for villagers reduced shifting cultivation

Improved forest conditions	93%	0%	7%	Improved forest ownership for villagers improved forest management
Freedom in forest uses	70%	30%	0%	Improved village forest regulations and agreement provided clear guidance on forest uses
Average	91%	8%	1%	

Source: Field survey, May 2011.

Villagers' concerns

Villagers are happy with their involvement in the project because it improved their livelihoods, infrastructure, and their capacity. They believe that by continuing the effort, it will sustain the forests and their livelihoods. But concerns were also raised regarding the sustainability of the initiatives after SUFORD phases out in 2012. This is a concern not only for the villagers, but also for the responsible government officers. DoF recognizes the issues and is in the process of seeking solutions. Another concern raised by villagers was that the rural development grant provided by the project is limited in amount and they propose that SUFORD increase the fund amount and continue the project activities.

Conclusion

The project has showed initial positive impact on rural livelihoods. However, the improvements appear to have been mainly contributed by the grant provided by the project rather than the direct benefits gained from the share of forest revenues and labor service. While the share from timber revenues that go to the village development fund and forest management fund is still too low, it is early to say whether or not forest management under this system can be sustainable without external financial support, unless the GoL can afford to fund it. With the government's current capacity, it is more unlikely. However, because PSFMS is currently the best option that can be applied, the system should be further developed and tested while being expanded into the other PDFs.

Case study 3: contribution of PES to poverty reduction: the case of NT2 Hydroelectric Project

Introduction

The Nam Theun 2 Hydroelectric Project (NT2) is one of the largest hydropower development projects in Lao PDR and is owned by private shareholders and the Lao Government. NT2 can generate an average 6,000 GWh of electricity per year. Most of this electricity will be exported to Thailand and will earn for the Lao government an average of US$80 million per year over the first 25 years of the project's operation. NT2 is regarded as the first green industry in Lao PDR recognized by independent experts as having the potential to greatly contribute to the country's development objectives. The government sees it as a great potential for poverty reduction in the surrounding areas as well as for the whole country.

NT2 was designed to incorporate a complete set of economic, environmental, and social programs to mitigate its effects on local people and ecosystems, and to improve living standards in the areas over the entire project area. On the social side, NT2 has a long-term commitment to the welfare of these people through its livelihood and downstream programs. On the environmental side, the project has worked on the long-term protection of the surrounding watershed and the Nakai-Nam Theun NBCA. Toward these objectives, NT2 had agreed to provide US$1 million per year for the implementation of programs under this framework starting in 2005 as the commercial operation started. Provision of this fund will cover the whole operating phase of 25 years. On top of this, NT2 has provided US$6,500,000 to the WMPA for the construction phase.

The case study examines and highlights possible contribution of PES from the NT2 hydropower dams to reduce poverty among people living in the NBCA. The assessment in this study concentrates only

on impacts from rural development activities rather than focusing on environmental impact. Because the project site is difficult to access during the rainy season, the analysis is mostly based on secondary information and additional information from key project staff.

Brief about the NT2 Watershed

The NT2 Watershed is the biggest watershed area in Lao PDR and Southeast Asia. It has a total area of more than 430,000 ha, covering 31 villages belonging to three village clusters. The watershed is easily accessible. The people living in the area have a diverse ethnic composition, comprising four main ethno-linguistic groupings of Vietic, Brou, Tai-Kadai and Hmong backgrounds. The livelihoods of all these different groups rely heavily on the forest, wildlife, and natural resources of the NT2 watershed.

In general, people in the area are poor and suffer from rice shortages. Almost one-third of the interviewed villages report that 76-100 percent of households are short of rice at some time during the year. Rice shortages last from one to 12 months, with the majority of villages reporting shortages of less than seven months. About 50 percent of the total households practice shifting cultivation, 35 percent combine shifting cultivation and paddy rice farming, and only 10 percent practice paddy cultivation with cash crops.

Livestock plays an important role in the daily life of villagers. These animals are used for food, labor, and income generation. In the last few years, livestock generated more than LAK 1,460 million for the villagers. The majority of people rear buffalos, pigs, goats, poultry, and a few cattle. Fishing activity is just an additional livelihood practice. Almost all (98 percent) of the surveyed villages indicate that many of the aquatic resource species are important food sources for households in their village and that fish is an important food source.

NWFPs are important for people's livelihoods in the area. About 96 percent of villages indicate that many of the edible plants are important food sources for households, including bamboo shoots, rattan shoots, and forest vegetables. NWFPs that are important for their incomes include cardamom, eaglewood, rattan, nuts, bong bark, orchids, bamboo shoots, "khrea haem" climbing vine, and broom grass.

Project intervention

To implement the NT2 commitments on environmental and social compensation, the NT2 Watershed Management and Protection Authority (NT2 WMPA) was established under Prime Ministerial Decree 25, on 26 February 2001 and updated by Decree 39/PM dated 21 February 2005. The role of NT2 WMPA is to manage, develop, and protect the NT2 watershed. The authority is backed up by technical assistance from NTPC. The Social and Environmental Management Framework and 1st Operational Plan (SEMFOP 1) was a guiding document for the period from April 2004 to September 2011 when it was developed and implemented. The implementation of SEMFOP 1 ends in September 2011 and the development of the 2nd Operational Plan covering 2011-2015 is being undertaken.

The purpose of the SEMFOP 1 was to ensure the effective, long-term protection of the biodiversity and watershed values of the NT2 catchment while safeguarding the wellbeing, traditional livelihoods, and cultures of the affected communities. The SEMFOP1 was implemented through three main programs: (i) land and forest planning and management and land allocation for management by local villagers and local authorities; (ii) biodiversity surveys, monitoring, research and protection; and (iii) improving the living conditions of the people. Two other programs—community outreach and conservation awareness and ecotourism—were set up to support the three main programs.

To ensure the integration of the three main components, the program was implemented through (i) involvement of beneficiaries; (ii) participatory NBCA management; (iii) establishing and implementing official tools such as agreements, contracts, and regulations; and (iv) implementing conservation and development activities.

To fulfill the objectives, WMPA implemented SEMFOP 1 through the Participatory Integrated Conservation and Development (PICAD) approach to seek a balance between regulation enforcement and community participation, between conservation and village development. The PICAD has three

main component activities, including: (i) Forest and Land Use Planning, Allocation and Management; (ii) Participatory Protected Area Management; and (iii) Livelihood Development for Conservation.

To ensure the participation of local people and equitable benefit-sharing in the watershed, extensive community consultations were conducted throughout the working process. The communication was enabled by setting up a Village Integrated Conservation and Development Committee (VICAD) in each village to work closely with the project teams in planning project activities in their respective villages. In addition, the VICAD set up its Village Conservation Monitoring Unit and Village Development Unit to participate in the programs of the WMPA and the district. The VICAD is also responsible for joint monitoring and evaluating the land use and land allocation in its own land and forest land. The following summarize the livelihood improvements.

Livelihood improvement

- Support for livestock raising, including livestock vaccination funds to 20 villages
- Support for domestic animal-raising funds of more than LAK 200 million; administering vaccination to 22 percent of cattle, 88 percent of pigs, 34 percent of goats, and 85 percent of poultry; and introducing fodder seeds (ruzy, guinea and stylo) to improve animal feed production
- Support for crop production, providing 2,410 kg of high-yielding varieties (Thadokkham 1, Thadokkham 11, Sebuta, Nok, Mahinsung, Laboul, Vieng), maize seeds, fertilizers, and vegetable seeds; and providing rice bank funds of 45 tonnes of rice for nine villages
- Support for the establishment of a savings fund in three villages amounting to LAK 43,972,000; giving LAK 4.5 million to the weaving fund and setting up a local trading and exchange group with more than LAK 40 million
- Support for villagers' income-generation activities in the amount of LAK 1 billion through participation in activities of the authority during the last five years

Basic infrastructure development

- Improved and constructed 49.5 km of hand tractor-based tracks and 19 small bridges between villages within the NBCA
- Established three cluster centers with solar cells and IP Star communication facilities
- Established 12 water supplies for affected villages to use
- Provided 275 sets of solar cells and a small hydro-electric power station (10 kw)
- Conducted a feasibility survey and completed the design of three sites for small-scale hydropower, with one hydro plant (expected capacity of 40 kw), to supply affected villages with electricity from the dam.
- Constructed three small-scale irrigation systems with drainage capacity up to 20 ha
- Provided one small four-wheel tractor (50Hp) for paddy field clearance and tracks renovation

Education

- Renovated and constructed primary schools, and one secondary school
- Supported educational materials (books and book boxes), sports equipment, and vegetable seeds for school gardens
- Provided LAK 572 million as salary payments to 47 teachers
- Provided accommodation in Nakai for four students from Navang cluster
- Cooperated with the vocational center on the future support of people from NBCA who intend to pursue higher studies in Nakai or other areas

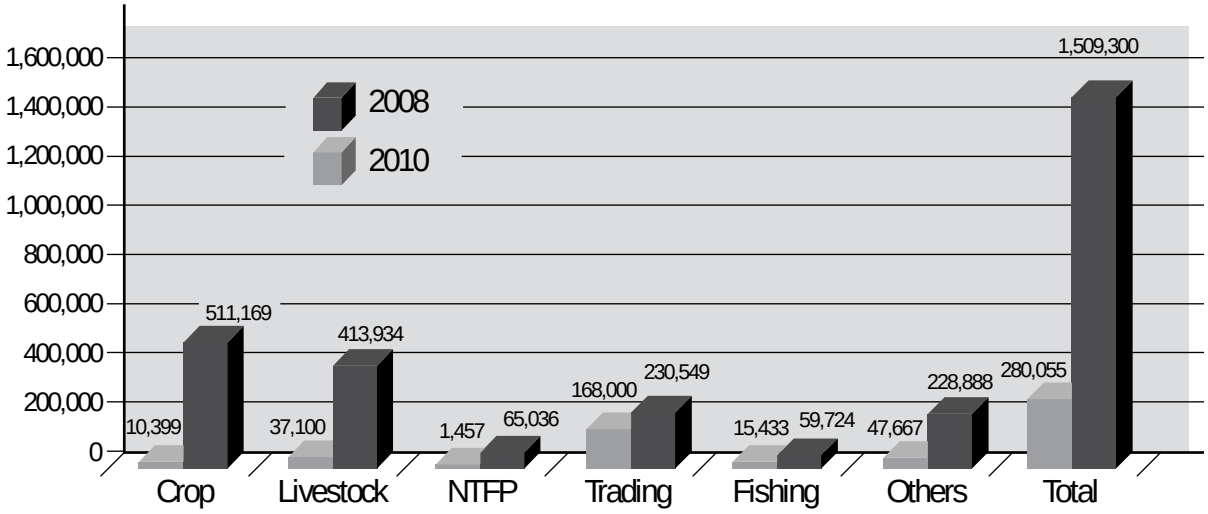
Health care

- Provided LAK 80 million to pay four nurses working in the NBCA (LAK 16 million per year) and more than LAK 3.4 million for medicine boxes of 11 villages (31 sub-villages) in the NBCA
- Supported the rebuilding and construction of four health care centers
- Built capacity for women of 11 target villages in the NBCA by providing training in family planning with the participation of 681 people, including 377 women

Impact on livelihoods

According to the WMPA, the project intervention had a significant impact on people's livelihoods in the watershed. The quality of life of the people within NBCA improved. In terms of income, the average household cash income per year increased five-fold within two years, from about LAK 280,000 (US$35) in 2008 to LAK 1.5 million (US$187) in 2010.

Figure VI.5. SUFORD's impacts on livelihoods



Source: Modified from WMPA studies in 2010.

As can be observed from Figure VI.5 above, significant increases of cash income were from crop production and livestock-rearing as the project concentrated efforts on food security as the top priority. This is followed by incomes from small trading activities indicating the new emerging trading traffic into the areas. This could be attributed to improved accessibility to the areas or increased buying power resulting from increased internal income from the other sources.

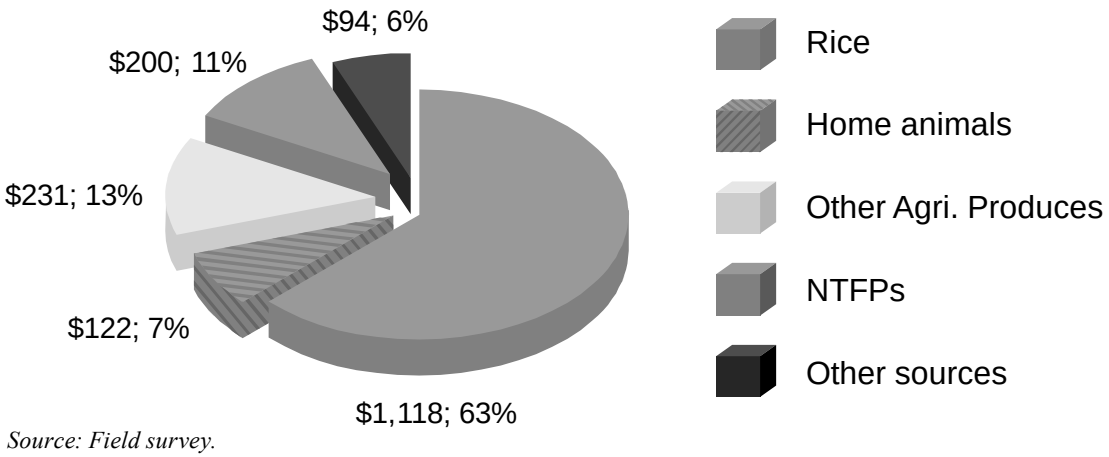
In addition, rice production was reported to increase, narrowing the gap of rice shortages from seven months in 2008 to four months in 2010. Even though rice production was still not enough, villagers no longer experienced starvation. They filled the gap with maize or cassava. Trading made rice accessible. Health care and education services were also improved. More children attended schools and the rate of illiteracy among the young generation was dramatically reduced. Figure VI.6 reflects improved people's livelihoods in the areas.

According to WMPA's wealth rankings in 2008 and 2010, eight households moved from medium to rich class, 37 households or 16 percent were freed from the poor category and could move up to medium class, resulting in a reduced number of poor households. However, the significant increase in the number of households in the middle class within two years is suspected to have resulted from resettlement.

In conclusion, the compensation from NT2 used by the WMPA to conserve and improve livelihoods of people living in NBCA provided significant contributions to poverty reduction in the areas. The impact on livelihoods would be certainly more obvious in a longer period, if the effort is continued. By

that time, it is foreseen that there will be more income opportunities emerging and people will be less dependent on agriculture and forest resources.

Figure VI.6. Important household income sources



Source: Field survey.

Outlook for forestry and poverty alleviation

Poverty is the key problem in Lao PDR. Forest resources provide a significant contribution to poverty reduction, especially for the majority of poor people who live in rural areas and whose livelihoods depend on forest resources for survival. Examples discussed in this study confirm that there are both direct and indirect contributions provided by forests and forestry to poverty alleviation. Direct contribution can be seen in the forms of food, income, medicine, other materials for household subsistence. Indirect contribution is in the form of the contribution to the national income that the government partially uses for infrastructure development, such as road access, education, health care, electricity network, which in turn contribute to poverty alleviation.

However, the magnitude and sustainability of the contribution depend on the type and size of forests and forestry. The contribution of natural forests is more relevant to rural poverty, providing diversity and exceeding the contribution from plantations. Examples of the contribution from natural forest resources in traditional forestry illustrate how much rural people benefit from forest products for their survival. However, the contribution from the investments in commercial plantations does not show significant impact to poverty alleviation, especially for rural poverty, even though it is important for the national economy and forest policy targets. On the other hand, in many cases, the large plantations (through land concessions) exacerbate poverty as in the cases of the rubber investments in Champascak and Saravan Provinces.

In conclusion, forests and forestry provide significant contributions to poverty alleviation in Lao PDR, but the contribution decreases as deforestation continues.

Lao PDR experienced rapid deforestation in the last two decades. In the 1990s, deforestation was mainly attributed to shifting cultivation, a traditional upland farming system practiced mostly by poor farmers in mountainous areas. Shifting cultivation had poverty implications in the past, simply because it was then the only livelihood option that ensured food security in mountainous areas. This practice involved the clearing and burning of forests before cultivating upland rice. Recognizing the negative effects of shifting cultivation on natural forests, the GoL tried hard to stop the farming practice from the early 1990s onwards through the implementation of livelihood alternative projects and programs. But despite a massive reduction in the cultivation area, the absolute eradication of this practice targeted by the end of 2010 did not happen.

With the absence of better upland livelihood alternatives and with rural people needing rice for their survival,

shifting cultivation is foreseen to continue for a while. To tackle this chronic and complex concern, the GoL has incorporated solutions in the 7th NSEDP and targets to eradicate the practice by 2015.

Another key driver of deforestation is unsustainable logging. An increasing demand on Lao timber from neighboring countries has put heavy pressure on Lao forests. Logging in Lao PDR is allowed only in PDFs with approved sustainable forest management plans. In special cases, logging is also allowed in forest areas with special permission from the GoL for infrastructure development projects.

While the GoL is in the process of putting all PDFs under PSFMS, logging is limited in 19 PDFs already covered by sustainable forest management plans and some development areas. These are not meeting the current wood demand. The supply capacity from these two sources does not meet the increasing demand for Lao timber. This has resulted in occasional illegal logging and trading but these illegal practices are increasing, particularly the illegal trade of rose wood. In response, the GoL has created the Department of Forest Inspection within MAF to control illegal logging and timber trading. With support from SUFORD, the GoL has strengthened the legal framework and capacity for law enforcement and taken serious actions to control the situation. However, with a special price incentive, illegal timber trading from unsustainable sources often reemerges. In this situation, if no measures are seriously taken, such illegal practices can accelerate deforestation in the country.

Another key factor directly affecting the Lao forests and forestry is the active pursuit of rapid economic growth, determined by a significantly increased FDI in natural resource base sectors, such as commercial plantations, hydropower electricity generation, and mining. In the last five years, Lao PDR has been successful in economic development. This growth has had substantial contributions from FDI in the natural resource base sectors such as hydropower electricity generation and mining. These sectors are expected to further grow in the next five years (2011-2015) to meet the share of 39 percent of the total GDP.

The investments in these natural resource base sectors, if developed effectively, can contribute significantly to national economic growth that in turn contributes to poverty eradication. But if not well-managed, these types of investments by nature have negative social and environmental impacts (Lao PDR Development Report 2010). The associated potential social negative impacts may include the loss of lands and other physical assets and reduced quality of water resources, and lead to changing livelihoods, food insecurity, loss of human capital, negative health impact, social tensions, and conflicts (Ibid.). The negative environmental impacts are directly associated with the loss of natural forest resources through the flooding of large forest areas for hydropower dams, clearing forests for plantations, for mining operations, and for accessing essential infrastructure improvements to support the development of these industries (Callander 2007). Recently, the impacts increasingly have appeared in the country as a consequence of careless decentralized land concessions and accelerated deforestation. The situation has become an immense public concern in the country and has caught international attention.

The existing situations, if not reversed, will endanger Lao PDR's natural forest resources. As a consequence, the rural poor will lose opportunities to utilize natural forest resources such as NWFP and other forest products to secure their livelihoods, and their poverty situation will worsen. The continuous destruction of natural forests and the loss of fallow lands to foreign investors will also impact greatly on the rural poor through reduction and minimizing not only of opportunities to collect forest resources needed for livelihoods, but also of their land available for agriculture production. This leads to unemployment as the investment often does not provide permanent and fair-compensation jobs. As poor people are placed in this situation, there is a high tendency to encroach on forest areas continuing their shifting cultivation practices. The other danger that most likely will occur as a result of continuous deforestation is compromising the implementation of green industries such as hydropower development and ecotourism, favored by the GoL for sustainable socio-economic development and raising the vulnerability of Lao people to natural catastrophes.

Recommendations to improve the contribution of forestry to poverty alleviation

In conclusion, forests and forestry make a large contribution to the national economy as well as to poverty reduction. While man-made forests are expected to contribute more to the national economy and policy targets in terms of increased forest coverage, natural forests are most relevant and contribute mostly to reducing rural poverty. In comparison to commercial forestry, traditional forestry is essential for the local economy and for rural poverty alleviation, even if its contribution to the national economy may not be significant. In particular, it contributes to enabling communities to meet local basic needs for survival.

With regard to investments in commercial plantations, all three models are expected to contribute to poverty eradication at different levels and magnitudes. But all the models, even with opportunities for rural poor to participate and obtain some benefits, are not well-suited for rural poor people who mostly lack capital and lands. Moreover, large-scale plantations, where lands are mostly obtained from land concessions, tend to exacerbate rural poverty. If not well-managed, these also cause deforestation, resulting in many kinds of social and environmental impacts, including worsening poverty.

In terms of FDI, it is recognized that it significantly contributes to the growth of the Lao economy, helping the country raise its GDP and HDI ranking. But due to weak management, the investments, particularly in the natural resource sectors, show social and environmental negative impacts, mostly deforestation and land use conflicts. If these situations continue, the Lao natural forests are in danger, ultimately resulting in social and environmental degradation.

There is an urgent need for the GoL to balance the situation between the promotion of economic growth, sustainable forest management, and poverty alleviation. For this to happen, the following recommendations are suggested.

Reconciling land use conflicts

To maintain natural forests, land-use conflicts need to be reconciled. These conflicts are between forests and other development practices such as forest land conversion into agriculture production (shifting cultivation, commercial cash crop cultivation, and large-scale plantation), and infrastructure development (hydropower dams, communications network, mining, etc). The following recommendations are proposed to solve or minimize the problems.

Completing and enforcing the ongoing land-use zoning activities

To address land-use conflict and prevent forest encroachment, the GoL has spent efforts on land-use zoning at the district level in recent years. The zoning is not yet completed in all districts, but completion is expected to be effected in all districts by the end of 2011. There is an urgent need for the GoL to put more effort into completing the nationwide zoning and the legal procedures needed before handing over to local authorities for implementation.

The land use zoning at the district level should also be further developed into land-use plans at village and village cluster levels to enable the actual land-use planning process to work effectively. The existing "Manual on Participatory Land Use Planning at Village and Village Cluster Levels" will be used to guide the planning process. For forest lands where areas were demarcated and mapped, efforts should be given to acknowledge ground markings to ensure that forest boundaries are clearly identified.

Another problem associated with land-use zoning is its ineffective usage in land-based development planning activities. Many reasons for the failure have been identified but are mostly related to the lack of enforcing regulations. Thus, a strong legal framework must be developed and enforced.

Improving the approval process for large-scale land lease and land concession

The other way to reconcile land-use conflicts is to improve the approval process for large-scale land lease and the land concession process to minimize social and environmental impacts from land uses. There is a need to improve coordination among government agencies through the integration and harmonization of sector strategies and clear division of roles and responsibilities.

There is also a need for GoL to enhance the relevant policy and regulatory framework. Although Lao PDR has a comprehensive set of investment, environmental, and social laws and regulations, these contain several gaps and loopholes that need to be addressed. These include, for instance, uncertain land tenure and lack of protection for farmers. In addition, these laws and regulations are poorly implemented and enforced.

Another important issue in the land concession approval process is the weakness in the application and implementation of the Environmental and Social Impacts Assessments (ESIAs), resulting in negative environment and social impacts. ESIAs are required for all large-scale land-based projects but are rarely practiced, and even the subsequent agreements are not always enforced. There must be stricter application and implementation of ESIAs.

Finally, to reconcile land-use conflicts, it is necessary to increase transparency in the government's investment approval process by allowing a wider participation of stakeholders in the decision-making process.

Sustainable forest management and utilization

Given the fact that natural forests provide the most benefits for poverty reduction, it is necessary to manage and utilize these resources in a sustainable and most effective manner. The Forest Strategy 2020 outlines the policy and strategic guidance and the following specific recommendations are proposed to guide actual implementation.

For production forests, GoL should expand the Participatory Sustainable Forest Management Approach applied under the SUFORD project to cover all 51 PFAs throughout the country. The benefit-sharing system should also be revised to ensure that sufficient funds are made available for forest management and fair local benefits.

For protection forests, the GoL should develop clear strategies for the management of demarcated production forest areas throughout the country. The strategy should encourage participation from all stakeholders with fair incentives and be linked to PES schemes and to commercialize forest rehabilitation schemes, such as fuelwood production and management for NWFPs. The implementation of protection forest strategy and its supporting regulations and guidelines must be developed and enforced.

For conservation forests, the 'Participatory Conservation and Development' approach will be applied in conjunction with PES schemes such as ecotourism and other suitable recreation activities. The approach applied by NT2 WMPA will be further developed and applied where applicable.

For all forest categories, forest management should incorporate NWFPs as one component to maximize benefits to rural people and all can be well-linked to ongoing efforts to implement the REDD plus R-Plan of the Lao government.

Increasing value for forest land and resources

In view of the rapid decline of forest resources and the potential contribution of forests to sustained poverty reduction, there is a need to maximize benefits from the resources. This can be done through the increased value of both forest resources and forest lands.

Local people have rights to use forest land, especially degraded forest land. This type of forest land is found in all forest categories and is accessible for rural people in adjacent villages, except for the core

zones of PTF and NBCA. Thus, to increase the contribution from forest land to poverty alleviation, the following are recommended:

- Promoting commercial forest-based activities such as NWFP plantations and fuelwood production in degraded forest land;
- Reconsidering large-scale concessions while promoting small-scale and contract farming plantations;
- Promoting agro-forestry in commercial plantations;
- Enhancing existing mechanisms and systems for collecting and distribution of compensatory payments from forest environmental services and ensuring that the payment is fairly distributed to rural development and poverty alleviation; and
- Increasing land lease rates and taxes for FDI projects.

Lao forest resources, especially NWFPs, are traded mostly in raw material form. These resources can provide significant additional values if processed internally. The processing of forest products is strongly promoted. The promotion of NWFP processing and marketing should be given high attention as it is more relevant to poverty alleviation. This should be promoted in the form of small-scale Lao enterprises as experiences of this type already exist in the country. The formation of community-based marketing groups for these products as in the case of Ban Nampheng should be further developed and applied. The other option is to increase the value of Lao timber through forest certification.

Capacity building

One of the forestry sector's weak points in implementing FS2020 is the insufficient human capacity; hence, the need for the forestry sector to strengthen human resource development (HRD). While concentrating on HRD, the forestry sector will face a temporary staff shortage, but this can be addressed by enhancing institutional collaboration with partnering institutions. HRD must be well-planned and based on periodic projected needs.

In terms of financial capacity, there are emerging opportunities from involvement in REDD schemes. Efforts should be given to the enhancement of the Forest Development Fund, and focus on PES as an important source.

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VII

Assessment of the contribution of forestry to poverty alleviation in Nepal

Bishnu Hari Pandit*

Introduction

Forest situation

Allocation of tenure over forest resources in Nepal is complicated, and there is a need to assess different forestry modalities and agriculture land tenure arrangement and other factors. Nepal is diverse in terms of geography, forests and other social conditions.

Based on estimates, the total forest cover of Nepal in 2010 stands at 3.6 million ha or 25 percent of the country's total land area (14.3 million ha), while other wooded lands coverage is almost 1.9 million ha or 13 percent (Table VII.1) (FAO 2010). Heavy deforestation in the country occurred from 1990 to 2000, at an annual rate of 2.09 percent (Ibid.), which decreased to 1.39 percent from 2000 to 2005. During the last five years (2005-2010), forest cover remained constant (Ibid.). The primary reason for the constant forest cover in recent years is the community forestry program implemented mostly in the hills.

The Forest Policy 2000 classifies the forests in the country into eight categories, namely: (i) government managed forests; (ii) community forests; (iii) leasehold forests; (iv) religious forests; (v) private forests; (vi) protected areas; (vii) conservation areas; and (viii) protected watershed.

More than two-thirds of the country's total forest area (85 percent) is still managed by the Department of Forests (DOF) as national forests. Of this forest area, the government manages around 51 percent and the rest is under community and leasehold forest

Table VII.1. Total land area, population, GDP and forest cover

Description	Unit	Figure
1. Total land	Ha	14,318,000
2. Population	Density per sq km	2.1
	Growth rate (%)	1.8
	Rural (%)	83
3. GDP (2008*)	Per capita (ppp)	1,104
	Growth rate (%)	5.3
4. Poverty level change (%)	1996	42
	1996-2004	31
	2005-2010	25.4
5. Total Forest Area	Ha	3,636,000
	% of land area	25
6. Other wooded land	Ha	1,897,000
	% of land area	13
7. Forest cover change (%)	1990-2000	-2.09
	2000-2005	-1.39
	2005 – 2010	00

Source: FAO, 2008, 2010 & World Bank, 2010.*

*Kathmandu Forestry College (KAFCOL), Nepal

management regimes (Table VII.2). Government-managed forests (GMFs), over which local people have no legal rights, are distant from settlements. However, of the government-managed forests, around 10 percent is traditionally managed by local people (Pandit 2003) and, de facto, they continue to have access over the forest resources. The DOF, as the caretaker and manager of these forests, is not able to successfully manage the forests in the hills and mountains due to the forests' remoteness and the department's shortage of resources. The management objectives for GMFs are oriented towards protection and extraction of timber, especially in the terai region (the southern belt of Nepal, usually a plain area below 1,000 masl with sub-tropical climatic conditions). The main work of the District Forest Office (DFO) is the protection of forest resources for future use. Non-wood forest products (NWFPs) are given less focus in GMF management plans.

Table VII.2. Forest management practices by type of forests

Type of regime	Management Practices	Coverage
Government-managed forests	• Most forest areas in upper zones are open access due to remote location and lack of DOF human resources • Management objective is oriented towards forest protection • District Forest Offices (DFO) mainly issue permits for NWFP collection and occasionally for timber	2,812,346,000 ha (50.83%)
Protected area forests	• PA management is under the Department of National Parks and Wildlife Conservation (DNPWC) • Act (1996) includes provision for buffer zone community forest • In some PAs, some people are allowed to collect fodder, grasses, and dead and fallen firewood. Partial access to forest resources is allowed subject to the approval of the park warden.	830,000 ha (15%)*
Community forests	• Forests are managed based on CF operational plan (OP) prepared by users in collaboration with DFO. OPs provide rules for harvesting of forest products, including timber. • Non-FUG members are not permitted to use any forest resources.	1,652,654 ha ** (29.85%); 17,685 CFs; 2,177,858 households
Leasehold forests	• Forests (mostly degraded) are allocated to the poorest households of the community; rich and non-poor households are excluded from the program • Users are granted rights on land and forests usually for 40 years	35,000 ha (0.63%); 6,041 LFs; 56,018 households
Religious forests	• Religious forests are allocated to a trust or community for religious purposes. • Users collect fodder, deadwood, dry branches and twigs and tree felling is prohibited. There is no mention of the use of other NWFPs. • Outsiders are not permitted to collect forest products.	Very few
	Total Forest area including wooded lands	5,533,000

*Source: Compiled from different sources, * Kanel 2010, **Department of Forests 2011.*

The Government of Nepal (GoN) has tried various community based forest management models to devolve power to the local level and reduce poverty. The community forestry (CF) model is more aligned with the objective of devolving power to the local people, where local stakeholders have the equal chance to participate. On the other hand, the leasehold forestry (LF) model is considered more relevant to the aim of reducing poverty, but outcomes still need to be assessed. The LF concept has also emerged to address poverty reduction and ecosystem degradation. The CF model has been in practice since 1978 after the development of the Forestry Sector Master Plan. However, the wider implementation of this model took place after the promulgation of Forest Act 1993 and Forest Regulation 1995. CF area covers almost 30 percent of the forest area of Nepal, involving 17,685 community forest user groups (CFUGs) (DOF 2011). The total LFs issued make up barely one percent of the total forest area.

Protected areas (PAs), which include national parks and reserves, cover more than 15 percent of the

total land area of Nepal. PA management is under the Department of National Parks and Wildlife Conservation (DNPWC) and individual Conservation Area Management Committees (CAMCs) are organized for each PA. In some PAs, partial access to forest resources by the communities is allowed, subject to the approval of the park warden. People are allowed to collect fodder, grasses, and dead and fallen firewood. Buffer zone community forests can also be established. Also, 30-50 percent of income from PAs (for example, from fodder collection or visitors' entrance fees) is for local communities.

Religious forests are areas within the national forests allocated for a religious purpose to a trust or community, upon request. Villagers believe that such forests are shelters for deities or spirits; therefore, tree felling is strictly prohibited. However, the collection of fodder, dead wood, and twigs for fuelwood is allowed. Communities are responsible for conserving and developing religious forests based on agreements with the DFO. There are very few religious forests registered with the DFOs in Nepal.

The private forests are within the jurisdiction of the country's agricultural (cultivated) land owned by individual households. The total cultivated area of Nepal is more than 23 percent (or three million hectares) of the total land area of Nepal.

Economic situation

In 2010, the gross domestic product (GDP) of Nepal grew at the rate of 5.3 percent, and per capita GDP was US$1,104. The agriculture sector contributed about one-third of the total GDP (NPC 2010a). The agriculture sector growth rate during the fiscal year 2009-2010 was estimated as 3.3 percent. This growth rate was possible because of the promotion of cooperatives, irrigation, agriculture roads, agriculture credits, research and technology dissemination, rural electrification, and development of market mechanisms. In the next three-year period (2010-11 to 2012-13), the agriculture sector is estimated to grow by 3.9 percent and the non-agriculture sector, by 6.4 percent. This would be possible only by enhancing the above factors. Remittance, tourism, and trade also contributed significantly to the national economy. Remittance alone contributed 18 percent of the total GDP (Ibid.). Of the 4.83 million households in Nepal, 1.45 million (about 30 percent) receive remittances (GoN 2010).

The forestry sector is very important in terms of providing necessary goods and services to many rural people (Pandit and Kumar 2010). The share of the forestry sector to the GDP is lumped with the contribution of the agriculture sector, which accounts for about 33 percent of the national GDP. Only about 10 percent of this contribution from the agriculture sector is estimated as the contribution from the forestry sector (DFRS 2010). This report states that the positive contribution of forestry to the economy of Nepal and derived environmental benefits are underestimated.

Poverty situation

Human poverty incidence varies across regions and sub-regions and forest cover in the country. Poverty incidence is higher in rural areas and the mountain belt (Human Development Report 2009). It is highest in the western mountains and in the far-western hills, where it is about 1.6 times higher than that of the central hills, where HPI is lowest. The overlay between forest cover and poverty incidence shows that poverty is more severe in areas where forest cover is low, and is less in high and dense forests.

Reviews reveal that the overall poverty and human indices in Nepal significantly improved in recent years. The National Planning Commission (NPC) estimated a reduction of 11 percentage points in the absolute poverty level, from 42 percent in 1989 to 31 percent in 2005 (NPC 2008). The poverty level was further reduced to 25.4 percent in 2010 (NPC 2010a). If this trend progresses, the country may be able to achieve its Millennium Development Goal (MDG) 1 target on poverty reduction—reducing extreme poverty to 21 percent—in 2015. The reasons for this improvement are multiple, including increased wage rates, increasing trend toward urbanization, increasing proportion of active human resources and the inflow of huge amounts of remittances (Ibid.). Remittances are a major source of income in rural Nepal. Despite the decrease in the absolute poverty level, the Gini coefficient (which shows the inequality of income distribution and reflects the gap between the rich and the poor)

increased from 0.34 to 0.41 from 2001 to 2006. On the other hand, the human development index (HDI) slightly improved from 0.513 to 0.527 (NPC 2008). However, Nepal still remains as a country of low HDI and is placed at the 138th position in the global HDI ranking (HDR 2009).

In achieving the MDG targets and three-year approach plan (2011-2013), the forestry sector's contribution is vital. Over 80 percent of Nepal's population lives in rural areas, and subsistence agriculture, including forestry, is the main source of living.

Despite the increasing emphasis on the role of forests in poverty reduction, there are limited studies and information available for assessing what are the exact roles forests play in this aspect. A number of literatures reported the large contribution of household income from forest and environmental resources (Bapton and Cammaert 2007; Chand and Ghimire 2007; Pandit et al. 2009; Rayamajhi 2009), but documentation is lacking. Some authors state that forest resources can help improve the livelihoods of the poor (Pandit et al. 2009). Others argue that forests have a limited potential to contribute to poverty reduction and that forests sustain poverty (Angelsen and Wunder 2003). For instance, poor households mainly rely on forests for subsistence and safety nets rather than as a pathway out of poverty. These two contrasting viewpoints on the potential role of forests in relation to poverty reduction point to the critical need for a further investigation of this issue.

Poverty reduction and forestry in national policy

National poverty reduction strategy

It is understood that the poverty reduction agenda will be undermined if the major renewable natural resource base, such as forests, is threatened. Poverty reduction has been a strong agenda of national development strategies of the GoN since the adoption of the United Nations Millennium Declaration. Poverty is defined as pronounced deprivation in wellbeing, in terms of material deprivation (in income and consumption), lack of education and health services, vulnerability and exposure to risks, lack of opportunity to be heard, and powerlessness (World Bank 2000).

The 10th Five-Year Plan (2002-2007), also known as the Poverty Reduction Strategy Paper (PRSP) of Nepal developed by the National Planning Commission, explained poverty by many dimensions including high illiteracy, poor health, low sanitation, low food productivity or food insecurity, high child malnutrition, poor access to basic services, and inequalities among different socio-economic classes of people (NLSS 2004). Based on these factors, poverty is defined as a lack of wellbeing. Since the mid-1980s, poverty concepts changed from the simple consideration of income or consumption to definitions that include multiple dimensions of deprivation and wellbeing such as basic needs, self-determined lifestyles, choice, assets, capabilities, social inclusion, inequality, human rights, entitlement, vulnerability, and empowerment (CIFOR 2007; HDR 2009).

The development discourses in Nepal during the last three planning periods (8th Plan 1990-1995; 9th Plan 1996-2001, 10th Plan-2002-2007) targeted to reduce poverty in the country. The 10th plan was directly related to poverty reduction strategies of Nepal and divided poverty into three main categories—income poverty, human poverty and social exclusion—which capture various facets of poverty. The sole objective of the 10th plan period was to reduce the poverty level remarkably over the five-year period. To this end, the four pillars of poverty reduction strategy were formulated, namely: (i) achievement of high, sustained and broad-based economic growth; (ii) social sector and rural infrastructure development; (iii) targeted programs; and (iv) good governance.

Forestry policy

To address the challenges of poverty and environmental degradation, Nepal designed various policies, programs and strategies, including acts and regulations. These changes were in accordance with the political changes of the country. The enactment of the Panchayat Forest Rules and Panchayat Protected

Forest Rules in 1978 introduced for the first time the concept of "handing over" government forests to local communities with control of Panchayat[1]. Out of this legislation, a need for the community-based forest management approach that focuses on the poor emerged. Based on these, the GoN enacted its 20-year policy and planning framework in the Master Plan for Forest Sector (MPFS) 1988 for the development of Forest Sector (Table VII.3). One of the objectives of the MPFS was to reduce poverty and provide basic forest product needs of the rural people. This agenda was re-emphasized in the Forest Act 1993 and the Forest Regulation 1995 (Ministry of Forests and Soil Conservation 1995) after the inception of democracy in 1990.

Table VII.3 Time line of forest sector policy*

Forests managed privately for 104 years	
• Up to 1846 • Up to 1846	– Era of forest conversion to agricultural land – Privatization of forest by autocratic regime
Transition Period (six years)	
• 1950-1956	– Transition in the change in forest ownership from private to state ownership
Forest managed by the state for 36 years	
• 1957-1960 • 1961-1975 • 1976-1986 • 1987-1993	– Nationalization of private forests as State property – State control and command approach – State property managed by local government (local bodies) – Master Plan for Forestry Sector policy and legislative framework in place
Development of Community based forest management (17 years)	
• 1993-2000 • 2000-2010	– Development of community based forest management (community and leasehold forestry) and inclusion of the poverty reduction agenda – Recognition of the contribution of community forestry and leasehold forestry to national development goals, including poverty reduction

*Note: *Revised from Pokhrel et al. 2007.*

Legally, the forests managed by the DOF are classified into two categories, national forests and private forests, depending on the ownership of land on which trees grow (Pandit et al. 2009; Kanel 2010). For private forests, private entities own both the lands and the trees, while for national forests, the lands belong to the State, but management responsibilities of the forest resources are vested either with the government as GMF or with organized groups such as CFUGs, leasehold forest users groups (LFUGs), or religious groups. Buffer zone CFUGs are under protected area management. The 1993 Forest Act and 1995 Forest Regulation govern national forests that include CFs, LFs, RFs and where ownership of land belongs to government. In the GMF, the three forest management regimes (CFs, LFs, and RFs) only grant use rights to local communities.

On the other hand, the DNPWC governs the forests managed under the protected area system. The forest resources managed under DNPWC are for biodiversity conservation and the poverty reduction role is secondary. Approximately 15 percent of such forests are under the protected area system, which also include buffer zone areas. If wetlands, grasslands, ice lands and water bodies are included, the PA covers 23.1 percent of the total land (NPC 2010b). PAs were established in 1970 but only became effective after the promulgation of the National Park and Wildlife Conservation Act (NPWCA) in 1973. National parks and reserves are also considered protected forests. The NPWCA allows all revenues generated locally to be used in local community development and conservation through the CAMCs. The Local Self Governance Act of 1998 delegates authority to the village development committee[2] (VDC) to collect 30-50 percent tax on all natural resources throughout the country, including income from the conservation areas. This income is generated mainly through revenue collected from forest products use (for example, fodder, fuelwood, timber, sand, gravel, and visitors' entrance fees).

[1] Panchayat is the partyless political system proclaimed by King Mahendra in 1961 when all political parties were declared illegal. At the local level, the existing village development committee used to be the village panchayat before the onset of democracy in 1990.

[2] The village development committee or VDC is the lowest administrative political unit in Nepal.

The community-based forest management (CBFM) approach with special focus on reducing poverty evolved as a key strategy of Nepal over the past few decades. One of the assumptions behind this strategy is that local communities, when legally empowered to take control of the forest resources, can develop local-level institutions to organize the sustainable use of natural resources, thereby reducing poverty (Ojha et al. 2007; Pandit and Kumar 2009). These community-based models are community forestry, leasehold forestry and buffer zone community forestry under protected areas.

The GoN adopted various strategies to conserve forest resources and benefit local communities. Leasehold forests and community forests incorporated the poverty reduction agenda of the 10th plan (2002-2007) or the PRSP of Nepal. LF is focused on providing livelihood benefits to poor and landless people through forestry-related activities. The latest Forest Policy 2000 highlighted the following poverty reduction agenda:

1. Employ the poor and landless in nursery, plantation and management work, construction, forest harvesting, and forest-based industries;
2. Train individuals, provide financial support to establish private nurseries, and purchase their products;
3. Prioritize people below the poverty level in allocating leasehold forests, but only encourage them to engage in forestry if the benefits will exceed the costs. Avoid the practice of giving 'poor land to poor people';
4. Employ the poor and landless on government and leasehold forest plantations, including those using agro-forestry techniques;
5. Initiate programs and incentives to establish and manage tree farms on leasehold forest land for industrial and multiple use products; and
6. Pay a just income to the rural poor who collect raw materials like medicinal and aromatic plants for industries based on such forest products.

The above agenda were reinforced by the three-year interim plan (2007-2010) and three-year approach paper (2010-11 to 2013-14) and pro-poor policies, such as providing 35 percent of the income of community forests to the poorest of the poor in the community; providing 30-50 percent of the total income from protected areas for economic and social upliftment of the poor and deprived groups; granting a mixed share of revenues earned from government-managed forests to the poor; and investing funds accrued from forests' environmental services and benefits for poverty reduction activities (NPC 2008).

Past and current contribution of forestry to poverty reduction

Subsistence use of forests and allocation of tenure over forest resources

Traditional use of forests

From ancient times, local people managed government forests located close to villages for subsistence use. Prior to the implementation of the 20-year Forest Sector Master Plan (1988-89 to 2008-09), most forests of Nepal were managed traditionally. Forest management by organized local community groups started to increase only during the 1990s. In the traditional forest management system, the rights are not yet formally handed over to local communities, though some local clans claim certain forest areas they have long been using as their own and exercise control over their claimed forests. Having made uninterrupted use of these forests since the establishment of their villages, clans consider themselves the real owners and do not care about legal ownership. They refer to these forests as hamro ban, meaning "our forest" or "indigenous forests." Some of these traditionally claimed forests were owned by clans before the nationalization of all forests in 1957, which the clans deemed an unfair action and which they do not recognize. The claimants actually continue to

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A hanging foot bridge constructed using income generated by a CFUG

exercise exclusive rights to use and manage these forests and strictly prohibit outsiders from access, though there is no legal base for said prohibition.

There are many such forests, particularly in the hills above 1,500 masl, where control and management of forests by the DOF is weak. A study conducted in the mountains of Nepal in 2003 showed that there were four traditionally-managed forests with 26 households each in hills above 1,500 masl and two traditionally-managed forests with 65 households each in the lower elevation zone (below 1,500 masl) in three village development committee areas (Pandit 2003). On average, each VDC in the middle hills of Nepal has one such traditional forest. The proportion of traditional forests to community forests in the upper elevation was estimated at more than 10 percent and in the lower elevation, which cover almost 5 percent of the total forest area. Comparing this figure to the national average of community forests, there are 1,125 traditional forests managed by local communities without DFO intervention (Ibid.). Only those claiming such forests have the rights to use and manage these forests. As users are not concerned about the conservation of forest resources, the members of the households have free access to the resources and may collect as much as they can. Therefore, forest degradation is relatively higher compared to that in community forests (Ibid.). The contribution of traditional forests to the household economy cannot be directly interpreted because of lack of data, but local people are able to meet their subsistence needs.

Allocation of tenure over forest resources

Many agencies and projects in Nepal are involved in supporting CFs and LFs for the sustainable use and management of forest resources and achievement of the GoN's poverty reduction goals, which are consistent with the MDGs. These include the Food and Agriculture Organization of United Nations, Nepal Swiss Community Forestry Project, Livelihood and Forestry Program of UK Department of International Development, Leasehold Forestry and Livestock Program of the Government of Nepal, and Western Upland Poverty Alleviation Program.

The government implemented the Hills Leasehold Forestry and Forage Development Project (HLFFDP) from 1992 to 2003 in 10 districts of the country, with funding support from the International Fund

for Agricultural Development (IFAD). Building on the success of the HLFFDP, the GoN started the implementation of the Leasehold Forestry and Livestock Program in 2005 and undertook a bridging program during 2003 to 2005 without funding support from international agencies. To create better economic situations for the mid- and far-western districts of Nepal and contribute to improving livelihoods of the poor, an agreement was reached between the International Fund for Agriculture Development and GoN on 5 February 2002 to launch the Western Uplands Poverty Alleviation Project, which became effective in January 2003 with a time frame of 11 years.

Community forests

In accordance with the Forest Act of 1993, national forests can be handed over to local communities for forest development, conservation, and utilization for the collective benefits of the members. Access rights and management responsibilities are assigned to the responsible community forest users groups. CFUG members cannot sell their allocated forests nor transfer their rights of use to other people outside of the group. Any revenue generated from such forests has to be deposited in a CFUG bank account. The money can be used for various purposes, such as forest management, community drinking water supply, or income generation projects. The government has fixed the proportions of the total income to be spent for specific purposes: 25 percent for forest management; 35 percent for poverty alleviation; and the rest for community development works (for example, school repairs, drinking water system and roads improvement).

Based on the Forest Act of 1993 and Forest Regulations of 1995, the CFUG handover process requires the formation of a forest users group and submission of the group's constitution, together with an operational plan (OP) for a designated area of forest. The OP outlines the management strategies of forests and use patterns of forest products. CFUGs set clear rules for the collection of forest products in their OPs. In most cases, forest users prepare the constitution and OPs, in collaboration with the DFO and NGOs. Forests are handed over to the responsible CFUGs upon approval by the DFO of the constitution and OP, leading to the transfer of the forest management and use rights from the government to the CFUGs. The CFUGs also have the right to exclude non-CFUG members from the use of their designated community forests.

Many studies argued that the benefit-sharing mechanism in CF is not equitable (Kanal and Niraula 2004; Pokhrel 2007; Pandit and Kumar 2009).

Although poverty is given a lot of attention these days, poverty is reduced in few isolated cases where community groups support targeted pro-poor and locally-planned activities. A study conducted by Kanel and Niraula (2004) investigated that CFs generated a total of US$10 million annually from the sale of forest products, of which only 3-5 percent was spent for the poor. The bulk of the money was spent on various activities including forest conservation, community and local infrastructure development (hospital building, school building, drinking water and rural road construction). The recent CF guidelines (2009) set by the DOF provides the allocation of 35 percent of the CF income to poorer households.

RECOFTC/FAO (2009) revealed that villagers in Nepal benefit directly from community forestry if they are members of a CFUG, and indirectly through the development and improvement of local infrastructure. However, it appears that the wealthier members can take more advantage of the infrastructure projects. This is particularly apparent in the installation of electricity and the construction or improvements of irrigation canals. Many poor households do not have electrical appliances and either own little land or have no land at all that will benefit from irrigation systems. RECOFTC/FAO cited in Dev and Adhikari (2009) indicated that the CFUG contributed to half of the costs for construction of rural trail in Sindhupalchok District and 35 percent to the construction of irrigation canal.

The contribution of CF to the household economy varies according to the types of intervention carried out and local initiatives taken in the respective community forests. Rana and Subedi (2009) confirmed that the household income of group members increased by 26 percent in seven Livelihood Forestry Program (LFP) districts. This change is directly attributed to the support provided for the CFUGs.

Leasehold forests

Leasing out public forests to the private sector was officially conceptualized in the mid-1970s with the promulgation of the Leasehold Forestry Regulation pursuant to the 4th Amendment of Forest Act, 1961 (Bhattarai et al. 2007). The main aim of leasehold forestry was to mobilize private resources to increase the productivity of forest lands for the benefit of both the government and investors. Very few leasehold forests were handed over to the poorest groups until 1993.

The Forest Act of 1993 classified leasehold forest as one of the five categories of national forests in terms of management modalities. Portions of the forest are leased out to the poorest of the poor households for a tenure of 40 years, subject to renewal for another 40 years. The poorest of the poor households eligible for leasehold forest application are selected based on standard criteria set by the government. One of the criteria used for defining various categories of poor is food security. Household with food sufficiency for less than three months are considered ultra-poor households; those with food sufficiency for 3-6 months are poor; while households with 6-12 months food sufficiency are medium poor. Households that have food sufficiency throughout the year are considered non-poor and are not qualified for leasehold forestry support. Land ownership remains with the government, and a lessee has the right to manage and use all forest resources within the leased plots. The typical size of forests handed over to one group is 2.7 ha, which is then shared among the members. The average size for one household is 0.5 ha (FAON 2008). Annual fees are charged for leasehold forests handed over to industries or corporate bodies depending on the ecological region and size of the land. However, the fees are waived for the pro-poor leasehold forests.

The GoN implemented a pro-poor-focused leasehold forestry program, the Hills Leasehold Forestry and Forage Development Project (HLFFDP), in 10 districts in 1993. The aim of this project was to raise the income of families in the hills who were below the poverty line and to contribute to the improvement of the ecological conditions in the hills. The project ended in 2003. In 2005, the GoN started the implementation of the Leasehold Forestry and Livestock Program (LFLP), which is a continuation of HLFFDP, in 22 districts. The LFLP program builds on the success of the HLFFDP in helping set up leasehold forestry groups that are to be developed into village-based pro-poor institutions and that will serve as village-level finance institutions (Kafley 2007). A total of 5,113 leasehold forest groups (LFUGs) were formed at the end of 2010: 3,077 LFUGs during the LFLP implementation and 2,036 LFUGs during the HLFFDP phase. There are 16,502 households now involved in the leasehold forestry program. Less than one percent of the total land of Nepal is used for leasehold forestry. Some authors claim that many of these groups are recognized as viable groups for natural resources conservation and poverty reduction (Thomson 2000; IFAD 2003; LFLP 2005). These groups are federated into several inter-group associations and some of them developed into cooperatives for marketing of their products and to avail of the low interest rate loans.

A study commissioned by FAON (2008) indicated that 11 percent of the total leasehold member households (169 households) of 18 LFs in six districts had sufficient food. Of the total, 96 ultra-poor households before the leasehold forestry project 10 years ago, only seven percent shifted to medium poor, five percent to poor and 11 percent to rich category. The change in livelihood status in the control site was very low, where the same number of households was interviewed. Such an improvement in the wellbeing status of the leasehold forestry members was mainly attributed to their involvement in small livestock raising supported through

Table VII.4. NWFP trade records, Fiscal year 2009/2010

Development regions	Amount traded (kg)	Royalty earned (NR)
1. Eastern region	140,468	665,991
2. Central region	113,510	1,002,083
3. Western region	78,858	777,422
4. Midwestern region	352,535	2,814,393
5. Farwestern region	1,486,152	15,590,874
Total	2,171,523	20,850,763

Source: Department of Forest 2010; US$1 = NR 72

grass and fodder production in both leasehold plots and private farmlands, growing of multi-purpose species in leased plots, and vegetable production in private lands, as well as in other entrepreneurial activities such as collective fish raising, NWFP production, and bamboo and broom grass production in leasehold plots. The above-mentioned increase of wellbeing is evidenced by an increase of cash income among the sample households (at 2008 prices). Before the leasehold forestry program, the sample leasehold member households had an average annual cash income of Nepalese Rupee (NR) 25,589, which in 2008 increased to NR 43,768.

Commercial and industrial forestry

Nepal is lagging behind in terms of promoting commercial forestry. Some initiatives on ecotourism, village industries, and bio-energy are under way and their impacts are not assessed yet. A naturally beautiful country, Nepal is expected to earn more foreign currency and generate greater employment opportunities through ecotourism. Most of these initiatives are largely based on private sector investments. Public sector investment in commercial forestry is not so encouraging. The government's efforts in commercial forestry are limited to the marketing of timber and NWFPs through private sector involvement.

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Selling NWFPs, such as Zanthoxylum seeds, to middle men in the village can be a direct way of generating cash, although the value for the collector is usually low.

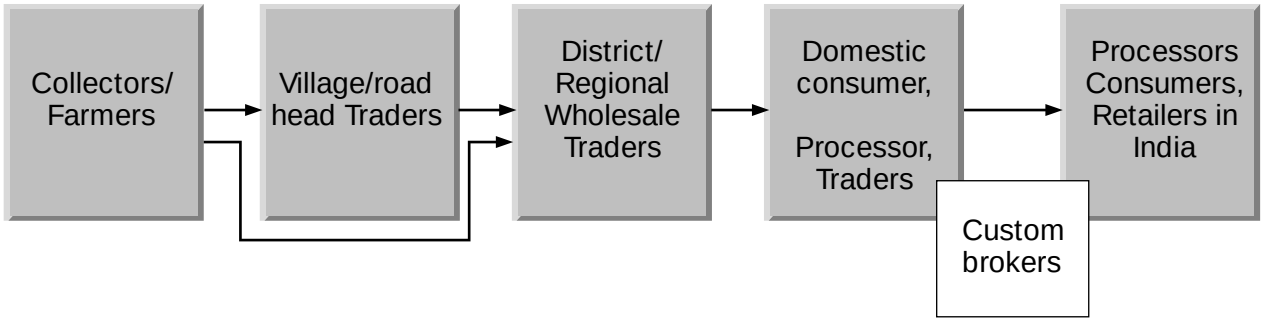
A study facilitated by CIFOR (2007) examined the effective practices and constraints of various community-based village and smallholders' NWFP enterprises in 13 districts of Nepal, which were focused on providing benefits to the poor. The tenure reform, i.e., clarifying and strengthening tenure rights at community level, through various village-based programs in Nepal in the last few decades, enhanced opportunities for the rural poor to benefit from such enterprises. However, a key concern as these programs advanced over the years was whether the poor were getting benefits, given their high dependence on forests. The practices of these enterprises that were effective in increasing income benefits include representation of the poor and marginalized groups in executive committees in the CFUG-based enterprises and targeted employment of the poorest households in the collection of NWFPs and in processing units in networks, and enabling the poor to own share capital in cooperatives and companies (Pandit et al. 2009).

NWFP commercialization

NWFP collectors in Nepal commonly sell NWFPs in raw or unprocessed form (Pandit and Kumar 2010). They sell these either to the village or to road head traders, who in turn sell the products either to wholesale traders based in the terai-plain areas or to national traders in the capital city (Figure VII.1). These are the key actors in the marketing chain who provide the vital link between the collectors-producers and buyers. Because of the presence of these intermediary traders, the share of collectors' income in the final price is considerably reduced.

Apart from the income from the sale of their products, the poor can also earn some income from carrying the raw products from the villages to the road heads or serving as porters. In community-based enterprises, the poorest of the poor households were employed.

Figure VII.1. Actors in NWFP value or product chain



Sixty-five different species of NWFPs were traded from July 2009 to July 2010 (GoN 2010). The total revenue from the royalties earned from these NWFPs was more than NR 20 million, and the volume traded was 2,171 tonnes (Table VII.4). The market price of this sale is estimated to be at least 10 times higher than that of the royalty collected by the government.

Because most of NWFPs are sold outside of the formal markets, NWFP contribution to poor people's livelihoods is not fully recognized and recorded, and is much lower than what is really earned from NWFP trade.

A study conducted in 2005 by the Livelihood Forestry Program in the eastern hills of Nepal indicated that traders legally export very few quantities (almost one-tenth of what is really exported). The rest is exported without paying royalties to the government. Evidence showed that a total of 13,988 tonnes of NWFPs were exported from 10 eastern districts (through three main borders) to India in 2003. It is surprising to note that this volume was almost equal to the NWFPs traded from a single district, Sankhuwasaba (LFP 2004). Where did the NWFPs collected from the other nine districts go? This indicates the illegal trading going on in the border to avoid royalty payments to the government.

The commercialization of NWFPs to benefit the poor faces market-related problems. One of these is that small-scale producers face more difficulties in markets compared to those for timber and agricultural goods because the markets for NWFPs tend to be small, dispersed, and lucrative.

Timber commercialization

The government of Nepal seemingly gives priority to timber marketing compared to NWFPs because timber marketing is easy and does not involve high risks from market failure.

Records of the DoF on the timber harvested or sold from July 2009 to July 2010 show that around one-half of the total timber volume for the period was sourced from private forests and around one-fifth from government-managed forests (Table VII.5). Community forests accounted for almost 27 percent of the timber sold, in addition to the five percent of the timber used by CFUG members. CFUGs paid the national government US$0.77 million in royalties and US$0.94 million in value added tax (VAT).

Timber market values vary according to the quality of timber and ranges from NR 400-1,200 per cu ft at the farm gate price. If we consider the average of two values, the total income from timber is NR 5.47 billion, which contributes about NR 210 per capita income per year. The annual royalty collected from CF is also significant to the national income, which is more than NR 55 million (Table VII.5).

Table VII.5. Total timber volume (cu ft) collected or sold from GMF, CF, and PF

Forest Type	Timber collected and placed at government depot (cu ft)	Timber sold or internally used		Royalty (NR)	VAT (NR)
		Volume (cu ft)	%		
1. Government-managed forests	2,014,042	1,297,641	19	-	-
2. Community forests	4,631,995	1,821,064	27	55,747,441	67,678,797
	-	372,271**	5		
3. Private forests	232,494*	3,347,391	49	-	50,051,815
Total		6,838,367	100	55,747,441	117,730,612

*Source: Department of Forest, 2010, Note: * Number of private trees cut, ** Internally used*

The rules related to the collection of royalty and VAT vary with the forest regimes. For instance, from GMF, 90 percent of the total royalty plus 13 percent VAT collected are deposited in the government treasury and the rest (10 percent) is sent to the District Development Committee (DDC). From CF, 15 percent of auctioned amount for tree species (*Shorea robusta* and *Acacia catechu*), if sold outside the CFUG, is deposited to government treasury, and similarly, a 13 percent VAT is paid for all sold wood outside the CFUG. From private forests, the 13 percent VAT is deposited to government treasury if sold to outsiders. The contractor who bids in the auction pays NR 5 per cu ft for the Forest Development Fund (FDF) to be deposited at the DFO.

Any individual or company seeking to buy timber should take part in the auction of the DFO. All timber harvested from GMFs is auctioned. The Timber Corporation of Nepal (TCN) is also allowed to harvest a fixed quantity of timber from each district and is generally half of yearly production. In Nepal, timber is marketed through three agencies: (i) DFO; (ii) TCN; and (iii) CFUGs.

The DFO harvests timber from GMFs as per-management plan. In the terai, half of the total quantity to be harvested is given to the TCN for sale. However, both organizations (DFO and TCN) have to auction all the timber harvested in separate lots. Sawmill owners and the furniture industry take part in the government auction of timber and the highest bidder gets the lot. On the payment of the required amount plus 13 percent VAT, the DFO issues permits for the transportation of logs to different destinations. The bidder deposits an extra NR 5 per cu ft, as discussed earlier in the Forest Development Fund at DFO. CFUGs also auction the wood that is not consumed or utilized within the CFUGs.

Plantations and processing

The government undertook large-scale block plantations in various locations in the terai region in Nepal (such as Kerkha in Jhapa district, Sagarnath in Sarlahi district, Tamagadi in Bara district, and Kohalpur in Kailali district). The GoN also initiated the establishment of some processing and manufacturing companies. The Virkuti Paper Mills is run with government support in Chitwan district. Similarly, NWFPs are processed in the Herbal Production and Processing Company Ltd. (HPCCL) in Kathmandu. The contributions of these plantations and manufacturer companies are not assessed in detail.

The Department of Forest Research and Survey (DFRS) did some assessments on the contribution of private sawmills and companies and the employment generated through these companies in three districts (Makawanpur, Kaski and Rupandehi). There are 194 sawmills in the three districts that generate about NR 177 million of cash earnings in one year. These sawmills provide employment to at least 114 people per district. The laborers working in these sawmills are poor people who migrated from the hills and mountains.

Payments for environmental services and carbon payments

The recent discussions on the role of forest in carbon sequestration are gaining interest in Nepal, but sustainability is a question as the contributions are from very few cases. It is believed that carbon forestry has the potential to generate funds for local people. A survey conducted in the mid- and high-hills of the Himalayan region indicated that the mean carbon pool size of a community-managed forest (excluding litter, herbs, and shrubs) is 504.31 tC02 per ha (Karky et al. 2009). This also includes soil organic carbon up to one meter depth. Of the total carbon, the mean annual increment rate of carbon capture was found to be 7.04 per ha (Karky et al. 2009). An ICIMOD report (2010) shows that 16 CFUGs in Kayarkhola watershed of Chitwan District received US$22,000 for their contribution to reducing carbon emissions (REPUBLICA 2011).

A study commissioned by the Ministry of Forest and Soil Conservation estimated the forest sector's contribution to the GDP using both direct and indirect use values. The result revealed about 9.5 percent contribution from the direct use values. The direct use values are consumptive goods such as timber, fuelwood, grass/fodder/bedding materials, NWFPs, sand, and boulders. Non-use values, such as recreation, ecotourism, soil conservation and carbon sequestration, provide an estimated contribution to the national GDP of 27 percent (Acharya et al. 2009).

Case studies

Selection of case study sites

Three case study sites were selected for this study based on some criteria of poverty such as remoteness, poverty level, scarcity of food/land and water, low educational attainment, and health conditions.

This report deals with the impacts of four initiatives in community forestry, leasehold forestry, conservation area forestry, and commercial forestry to poverty reduction from three districts, one each from terai, middle hills and high hills. Community forestry and commercial forestry (furniture enterprise) initiatives were selected for site 1, which is found in the Sewarkhola sub-watershed in Dang District. There are many furniture and sawmill industries in Dang District. Community forestry and leasehold forestry initiatives were selected for site 2 (within Sukekhola sub-watershed, Pyuthan District). Lastly, a conservation area forest management (indigenous forest management) initiative was selected for site 3, which is located within the Lete sub-watershed in Mustang District.

Table VII.6. Characteristics of case study sites

Case study sites	Basanta Hariyali Forest Users Group	Jaspur community forest and Barahasthan leasehold forest	Lete conservation area forest
Location	Sewarkhola sub-watershed, Dang (Inner Terai)	Sukekhola sub-watershed, Pyuthan (Middle Hills)	Lete sub-watershed, Mustang (High Hills)
Forestry initiative	Community Forestry and commercial forestry (Furniture making)	Community and Leasehold forestry	Conservation area forestry (indigenous forest management)
Name of FUG	Basanta Hariyali	Jaspur CF and Barahasthan LF	Lete conservation area forest
Area coverage (ha)	276	280	150
Number of households Start/Current	368/430	127/133	70/77
Sample Households Male/Female	16/8	15/5	12/4

Ethnic or caste composition	Tharu, Brahmin, Chhetri and Dalit (BK, Priyar and Sarki)	Magar, Brahmin, Chhetri and Dalit (BK, Priyar and Sarki)	Thakali, Gurung, Magar , Dalit (BK, Priyar and Sarki)
HPI	36.8	40	48.1
Food sufficiency	9-12 months	6-9 months	Less than 6 months
Literacy rate (%)	76.8	60	52.1
Forest types	Broad leaf sub-tropical Sal forest	Subtropical evergreen to semi-evergreen forests	Conifer and mixed broadleaf sub-temperate forests
Agriculture crops	Paddy, maize, millet, and wheat	Maize, paddy, millet	Wheat, oat, millet

Source: Field survey 2011.

Initiatives in Site I - Sewarkhola Sub-watershed of Dang District

Community forestry initiative

Ten years ago, the DoF handed over a community forest to the Basanta Hariyali Community Forest Users Group in Dang District through the initiative of the local people and the Livelihoods and Forestry Program funded by DFID. The total user households in the Basanta Hariyali CFUG increased from 368 in 2006 to 430 as of March 2011.

In the 10 years after the community forest was handed over to the Basanta Hariyali CFUG, the forest area increased by almost 10 percent. The members related that with the increasing number of users, the group faced the problem of meeting their fodder and fuelwood demands. Therefore, they increased the CF area by planting fodder trees (*Leucaena leucocephala*), grass (stylo and molasses), fuelwood species, and some NWFPs (*Cinnamomum tamala*, *Cinnamomum glaucescens*, *Asparagus racemosus*) in degraded common lands adjacent to the CF area.

Benefits from the CF

It is claimed that fodder tree plantation and grassland substantially contributed to meeting the fodder demand of the community. This is proven by the fact that almost 513 tonnes of green fodder were harvested from 2010 to 2011, valued at around NR one million. According to the CFUG members, "Our forests not only provided feeds to our animals, but also added organic matter to our farmlands and increased our crop production." The villagers collected a lot of leaf litter from the forest for compost making that contributed to soil fertility and increased farm production.

Box VII.1. Increased women's participation in the Basanta Hariyali CFUG committee

The secretary of the Basanta Hariyali CFUG committee, Ms. Laxmi Buda, (age 35) said that the representation of women and marginalized users from indigenous groups increased in the CFUG committee, which generated their enthusiasm in the CFUG. Out of 21 members, 13 are from indigenous and dalit communities.

In the beginning, there were no women in the committee, but now, there are six and four of them are dalits. "We are making decisions in favor of women and the poor in the distribution of CFUG fund and forest resources in an equitable manner." She says, "I am working for the CFUG as a CFUG staff and paid NR 2,000 per month. Aside from this direct benefit, the participation of the women and the poor in the CFUG activities, including decision making, increased. We are more hopeful that this system will continue in the future so that we can ensure CF benefits are directed to the poor and to the women." She further added, "In the past, our voice was not considered but now, what we say also counts and we are asked as well. We women are involved in the decision making process, unlike our minimal participation in the past."

The CF initiative was successful in fulfilling the demand of fuelwood for almost 60 percent of the members. An estimated total of 255 tonnes of fuelwood was harvested from this CF. Surplus quantities of fuelwood were sold in the market by employing poor local laborers (dalit or lower caste households). The CFUG generated group funds (NR 78,319) from this firewood surplus sale. The CFUG also employed some members from indigenous families (Box 2). Indigenous families are different from the dalits who form the "untouchable" caste in the Hindu hierarchy system.

The contribution of timber use and sale to poverty reduction was not very significant as shared by some members, primarily because no ultra-poor households were able to get benefits from the timber use within the CFUG. The value of timber sale is highest among other forest products harvested from the CF, but the benefits mostly reached the better-off households. The reason for the poor not benefitting from timber extraction is very simple: they are not able to invest money for house construction. The total timber volume used was 4,814 cubic feet (CFT), valued at more than NR three million. The money was used for forest development and management, a scholarship program for intelligent students from poor and disadvantaged families, community development (drinking water supply, school construction, etc.), and income generation activities (goat raising, vegetable production, asparagus cultivation, etc.) (Table VII.7). The bulk of the money was spent on income-generation activities followed by infrastructure and social support activities. On the other hand, the value of NWFPs produced was relatively smaller, but the benefits usually went to poorer households as members from poorer indigenous people form the majority in the CFUG committee. Respondents shared that on average, one household receives about NR 1,000 per year from sale of NWFPs in this CFUG.

Table VII.7. Use of CFUG and CAMC funds (in NR)

Activities	Name of Forest User Group		
	Basanta Hariyali CFUG (Dang)	Jaspur CFUG (Pyuthan)	Lete CAM forest (Mustang)
Forest management (nursery, plantation, weeding, pruning, and thinning)	65,060	40,335	17,364
School construction	-	452,990	-
Drinking water	15,266	-	12,600
Road or trail improvement	-	-	29,750
Income generation (asparagus cultivation, goat raising, vegetable production, hotel, cloth sewing, and other business)	52,050	40,119	254,317
Employment (peon and watchers, and administration staff)	97,252	54,813	11,033
Scholarship to intelligent poor and disadvantaged students	5,000	-	-
Capacity building (training and study tour)	-	4,709	46,048
Total	234,628	592,966	371,112
Use of CFUG funds/year	46,925	118,593	74,222

Source: Field survey 2011.

In discussing what proportion of the people's livelihoods was forest-based and how this initiative helped, local people found it difficult to respond. They concluded that the CF initiative was successful in contributing to at least 15 percent of their household income.

An equally relevant question was whether the forest resources were being degraded due to overuse or were being improved through sustainable harvest since the CF handover. Based on the CFUG members' observation, the changes in the forest conditions with respect to different components, such

as tree cover, biodiversity, NWFPs, plantation and wildlife density, were positive. In 2000, forest cover and wildlife density were relatively higher in government forests compared to community forests. However, now, the situation has changed and community forests are better in terms of biodiversity in species, forest cover, NWFP availability, and wildlife population. These direct environmental benefits, including indirect benefits such as increased milk production due to increased fodder and grasses, increased organic matter content in farmlands due to use of compost from forest leaf litter collection, were not accounted in the contribution of household benefits as discussed above.

In another CF, Sunpur, also in Dang District, the CFUG generates income from a form of payment for an environmental service their CF provides. The forest, which includes about 20 ha of *Bassia butyraceae* trees (locally called *chiuri*, a fruit tree with multiple benefits) planted about 35 years ago by the local people is being accessed yearly by hundreds of honeybee entrepreneurs from other districts for grazing their beehives. They pay NR 100 per beehive grazing. Every year, during the *Bassia* tree flowering time (November to January), the CFUG earns at least NR 100,000 and this is used for community development activities. Additionally, 30-50 families of this CFUG collect *Bassia* fruits and make herbal ghee. From the sale of this fruit, one household earns an average of NR 6,000-9,000 per year.

Commercial/industrial forestry initiative

Despite the huge diversity and quantity of timber and NWFPs in Dang District, forest products were not effectively utilized in the past. For the last five years, more than 100 sawmills and less than 10 NWFPs enterprises operated in the area. Only four of the 100 sawmills were community-run. The other sawmills and furniture enterprises were mostly run by individuals. Rich and elite families mostly used the benefits generated from these sawmills, and small benefits (such as employment) went to poorer households. More than NR 87 million was invested in sawmills and furniture enterprises, and that doubled gross returns to these entrepreneurs. A total of 993 local people (all men) were employed in these enterprises in the whole district (DFO 2011). Access to market information was limited among local traders, and there was no provision for financial services (P. Subedi, personal communication).

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Well-managed *shorea* forest of the Basanta Hariyali CFUG in Dang District which is a source of fodder, grass, fuelwood, timber and other non-wood products.

Community forestry is increasingly recognized as an effective tool for forest management, resource distribution, and community development in Nepal. But it lacks commercialization that is crucial for employment creation, income generation, and economic benefit provision to local communities. Timber is one of the valuable products in the CF, but it is still not used for commercialization, product development, and marketing by the community. The CFUGs get nominal prices for the wood and timber compared to the actual market price (LFP Report 2011).

The sawmills and furniture enterprises in Dang during the field visits were not effective in incorporating local carpentry skills into its development framework and in improving the rural economy. Although many of the local people are well-experienced in woodwork, their skills were confined to traditional activities, such as making khatiya (wooden cut), halo (plough), juwa (yoke), and some local furniture. Though there was a large area of forest around the foothills of Dang valley and plenty of available timber, utilization of resources was confined only to firewood, grass, and leaf litter. A large number of sal trees (*Shorea robusta*) in the forests that are fallen every year were wasted, lying unused. This is because it is prohibited for CFUGs to collect and trade *Shorea* timber if this is not included in the CF operational plan of their respective forests. The CFUGs seemed to have overlooked this potential cash earning resource readily available within their surroundings, as they expected only external support from the donor agencies.

In view of the above problems, the LFP initiated capacity building and pro-poor social inclusion activities in the commercial forestry sector. This program was implemented through collaboration with various stakeholders (including government agencies, international NGOs, and NWFP trading agencies) in Dang District. Policy feedback and support were other important interventions of the LFP. To promote pro-poor and socially-inclusive forestry-based commercial activities, LFP focused on the private public partnership approach that includes the collaboration with private sector agencies (along with a support package) for the sustainable management of the local resource base, and community-led processes and ownership. LFP facilitated the promotion of three furniture enterprises, two NWFP essential oil distillation units, and one spice enterprise in Dang District. Of the three furniture enterprises, two are run by mutkakamaiya or freed bonded laborers. Historically, freed bonded laborers used to be the slaves of big landlords and merchants for generations. Bonded labor is a form of contemporary slavery in which big landlords force poor people (belonging to the Tharu caste) to work in their farms and households for their entire life. The traditional caste system of Nepal forced them to stay in the lower social strata, and these people were in a suppressed and discriminated position. Most of them were dependent on working in rich people's houses to fulfill their basic requirements. When they were freed from the bonded labor, their livelihood strategies were mainly through wage-earning from farm work and seasonal migration for unskilled labor.

Establishment of a small furniture enterprise for the poor

One of the three furniture enterprises that the Livelihood Forestry Program supported in Dang district is run by two freed bonded laborers. Kaman Chaudhary and Rishi Chaudhary were freed on 17 July 2000. Both were conflict victims during the Maoist insurgency movement. Following the review of the Bonded Labor (Debt Bondage) Act after the people's revolt in 2006, the two men were freed along with other *mutkakamaiya*.

They established a furniture shop with a small sawing machine and other equipment (hand saw, circular saw, drill machine, sawn wood production machine, plunger, etc.) in 2009. The sawn wood production machine and other equipment were installed in a rented house located along the main road of Ghorai Bazaar. The rented house is old, crudely built, made of mud and stone, and roofed with thatch grasses, highly vulnerable to earthquakes and monsoon rains. The furniture shop was deemed a feasible enterprise considering the availability of forest products, easy access of the shop from the road and transportation network, high demand of processed timber from nearby markets, and availability of electricity.

Operational management

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The freed bonded laborers, Kaman Chaudhary and Rishi Chaudhary, in their furniture making shop

The operation and management of this enterprise is vested on the two freed bonded laborers, but the supply of wood and some investments are responsibilities of the Kafli Sota Manaiyadanda CFUG (of which the two freed bonded laborers are part) and the LFP. The CFUG has 70 households, of which 14 households are freed bonded laborers. LFP provided a grant support of NR 21,000 to this enterprise for buying the main machine and small equipment. The Kafli Soti CFUG provided the two shop owners with an interest-free loan of NR 4,000 to buy raw wood and timber for the enterprise. In accordance with the operational plan that the CFUG committee and the LFP decided recently, the two will operate the enterprise as a privatized unit under a number of terms and conditions. The two owners will be fully responsible for the operation and maintenance of the furniture industry, including the costs and expenses for labor input and electricity bills. They will pay back the loan of NR 4,000 to the CFUG. In the event that they will not be able to operate the industry or if they want to shift to other occupations, they must return the facilities to Kafli Sota Manaiyadanda CFUG. Every year, the CFUG committee and the two proprietors will review the input-output information and decide on the future management of the mill. The two should provide skills development and employment opportunities to the local people with the newly-established technology. The CFUG committee will provide them with dead wood and fallen trees and logs from the community forests at an agreed low price rate (NR 2,000 per cu ft for hardwood, NR 1,000 per cu ft of soft and low quality wood), and if necessary, the CFUG will officially issue an authorization letter to sell and transport the door and window frames and other products of the furniture mill in the local markets.

Benefits of furniture enterprise

Both owners expressed that the people previously did not put much value in fallen trees and logs they found lying on the ground within their community forest. However, after establishing the furniture industry, the members gathered the fallen wood and sold these at the shop. The prices of the trees have gone up, although the CFUG members have not standardized the rates. One of the main factors affecting the price determination of the goods and services is the purchasing capacity of the people. This is especially relevant in rural areas where cash is limited and non-monetary factors play an important role in price determination. Partly because of this, they expressed that it was very difficult to determine the prices of the fallen trees and logs in the community forest and to prepare a standard price list of different items.

Apart from the costs incurred for the wood supply, the other costs for making furniture include glue, plywood, and investments on the plunger, sawing machine, and other equipment and materials. They estimated that after deducting all their operational costs for making furniture, they earn NR 400-500 per day, which is almost NR 12,000-15,000 per month.

The Chaudarys shared that their furniture shop provides them employment in their village, so they need not leave their community in search of wage labor and temporary employment. In addition, they also employed five additional local poor people.

In early 2009, they were sent for a month-long training on furniture making and carpentry. After their training, they started producing timber products such as racks, benches, chairs, sofa sets, and others. They make the pieces of furniture according to the specific orders of their clients. But there is competition from other furniture-making shops nearby that have long been operating. The Chaudarys are developing their skills to meet the increasing product orders. Their increased earnings will allow them to repay their loan to the CFUG in one to two years.

Box VII.2. Furniture making enterprise: Providing livelihood for freed bonded laborers

Mr. Rishi Chaudary, aged 31, belongs to a Tharu tribal community. The Tharus are a group of indigenous peoples of Dang valley. Mr. Chaudhary and his family were former slaves for a long time in a rich family. There are 10-15 other Tharu households in this community. In 2007, when the government of Nepal passed the Bonded Labor Act, they were free to look for work like other people, and were no longer slaves.

Rishi became a member of the Kafli Sota Manaiyadanda CFUG. Prior to his involvement with furniture enterprise, he had no any alternative work except for working under a landlord. He is landless and has no other alternatives for livelihood. He related, "I had no other work alternative before this mill was established. My family lived in subsistence. I have one son and two daughters. My son, who is now nine years old, was not enrolled in school prior to this job. Now, I am able to send my son and daughter to the school. I had a very difficult time feeding my family. Two years ago, the LFP provided us NR 21,000 to buy equipment and machines for the furniture enterprise. My partner (Mr. Kaman Chaudhary, also a freed bonded laborer) and I now share this property."

With this work at the shop, he claimed, "I am able to maintain my family. I have money every day." On top of this, he says, "We have been able to give employment opportunities to five other local youth. Our past was very painful, terrible, and shocking, but now we are relieved and we can work toward ensuring the security of our livelihood activity."

Initiatives in Site II - Sukekhola Sub-watershed

Community forestry initiative

The Jaspur community forest, which comprises 280 ha of sub-tropical evergreen and semi-evergreen forest, was handed over in 2000 to an initial group of 127 households. Now, the membership has increased to 133 households. This means that one household has more than a hectare of CF land for their use and management. The main tree species found in Jaspur CF are *Schima wallichii* (*chilaune*), *Engelhardtia spicata* (*mauwa*), and *Castanopsis indica* (*dhalne katush*).

The socio-economic and environmental benefits derived from this CF are similar to those from the Basanta Hariyali CF. In terms of the socio-economic benefits, more dalits and disadvantaged members joined the CFUG committee. The CFUG committee reported that their voices are being heard by the elite, and the poor and the women are getting equal benefits from the use of fodder, firewood, and other forest products, except timber which is mostly used by richer members of the CFUG. The quantity of fodder harvested from this CF is almost the same as the Basanta Hariyali CF. Income from fodder and grass was valued at more than NR 5,000. Community members reported that more than 560 tonnes of leaf litter were collected from this forest for compost making, and used as organic manure in the farmlands. This is a free resource that enables the community to address the issue of excess removal of surface grasses and crop residues from farm lands. Further, a total of 200 tonnes of firewood, mostly from dead wood and fallen tree branches and twigs, were collected from this CF last year (2009-10). Jaspur CFUG earned NR 17,300, which was less than what Basanta Hariyali earned. Fuelwood demand is higher in Basanta Hariyali CFUG and the poorer households sell fuelwood in the nearby market. Selling fuelwood is less profitable in Pyuthan-Jaspur CF because it is in a rural area where there are fewer buyers compared to Basanta Hariyali CFUG which is situated in a semi-urban setting and where there are more buyers.

With regard to timber use, Jaspur CF utilized 1,548 cu ft, mostly for construction, repair, and maintenance of their houses. The total timber used was valued at NR one million. This CFUG also had higher per capita timber production than Basanta Hariyali CFUG. According to their records, Jaspur CFUG generated higher group funds (NR 605,848) from the sale of timber harvested than Basanta Hariyali CFUG (NR 155,526). Like in Basanta Hariyali CF, the money generated from sale of timber was used for the construction of the school building, health clinic, and irrigation systems.

Leasehold forestry initiative

The Barahasthan Leasehold Forest covers three hectares and is located in Dhungegadhi VDC-1 in Pyuthan District. In 2003, this forest was handed over as leasehold forest to six poor households (one Rai and five Magar) for 40 years. Each household is allocated half a hectare of forest land for their own leasehold forest. Prior to the handover of this degraded forest, there were very few sal saplings and trees growing in the area, and regeneration was very poor due to overgrazing and excessive harvesting. This area was open to almost everyone. At present, this area is converted into a greenery with various trees, shrub, and grass species. The various tree species include *sal, gideri, khaniyo* (*Ficus cunia*), *kutmero* (*Litsea monopetala*), *ipil-ipil* (*Leucaena leucocephala*), while the fruit trees include mango and lemon. The LFP promotes the fodder trees and fruit trees. Other crops grown are bananas, pineapples, and grasses that include *mott napier, Setaria* sp, and *amriso* (broom grass). NWFPs collected are molasses, stylo, *Asparagus racemosus, Agave* sp, and *Jatropha* sp.

Four of the six user households shared that they are not getting significant tangible benefits from their leasehold forests yet because the trees that they planted are still young and are not yet harvestable. However, there are still other direct economic benefits, through incomes generated from the sale of goats and milk of cattle and buffaloes. These income-earners benefitted from increased fodder and grass supply from the leasehold forestry plots. From a three-hectare plot, the six households obtained a gross return of NR 28,150 in one year. On the other hand, the intangible benefits were high, mostly from the rehabilitation of degraded forest lands. The women members are empowered and can talk about their rights. Natural regeneration took place as a result of the controlled grazing activities in the area, which allowed the growth of saplings and the seedlings they planted. Discussions with the user households revealed that the significant impacts brought by the LF initiative are improved conditions in terms of the quality and species diversity of their leasehold forests. It was further revealed the resilience of the sub-vegetation ecosystem is sufficient to reverse the process of soil degradation. These changes in the greenery, forage, trees, productivity of the forest land, and biodiversity were observed. The members of the LFUG reported that their LF area was heavily degraded prior to the implementation of LF, and now, the degraded forest area has been reduced to almost one-half.

Table VII.8. Forest products harvested and used in Barahasthan LFUG

Forest products	Total quantity and per household benefits		
	Total quantity	Rate (NR)	Amount (NR)
Timber-pole size (number)	300	15/pole	4,500
Firewood (kg)	5,400	2.5/kg	13500
Fodder and grasses (kg)	6,000	1.5/kg	9,000
NWFPs (broom number)	50	30	1,500
Total amount (NR)	-	-	28,150
Benefit (NR per household per year)			4,692

Source: Field survey 2011.

Box VII.3. Enhancing the capacity of women, Barahasthan LFUG

Ms. Kousila Gaha, 24, is a member of Barahasthan LFUG. She shared that now she can take part in the group discussion without hesitation. This is because the group meetings, in which she actively participates, provide her a venue to practice her oral communications skills. She said, "Now, women's voices are heard in the community and we are respected by the male partners as well."

Through the project support, women in the group started planting vegetables in their farms and banana saplings in the leased plot. Goat-raising increased her income substantially. From the earnings generated from the sale of brooms made out of the broom grass harvested from their LF, her group raised NR 1,500 during the last growing season. She is very happy with all these achievements from the leasehold forestry initiative.

Site III - Lete, Mustang District

Conservation area forestry initiative

In 1992, the Annapurna Conservation Area (ACA) in the Lete VDC was extended to its current size of 760,000 ha. The conservation area forest is located in Letekhola sub-watershed of Lete VDC, which is within the larger Kaligandaki watershed. The National Trust for Nature Conservation (NTNC) has overall management of the ACA, with the active participation of local communities who use the natural resources in the conservation area. The protection status of the area is Class VI according to the IUCN category of protected areas, in which all traditional land uses are permitted but large-scale conversion is restricted (Rayamajhi 2009; Cristensen 2009).

In 1999, the Annapurna Conservation Area Project (ACAP) constituted various sub-committees for forest management, tourism management, and ward-level women's group committee as a strategy for effective implementation of the activities of the conservation area management committee (CAMC) for Annapurna Conservation Area in Mustang District.

There are three such sub-committees in the Lete VDC, which are also supported by a council of 13 members headed by the mukhiya (village headman) at VDC level. This headman system is an indigenous system, which was legally abolished more than 50 years ago but still prevails in many villages. The mukhiyas are appointed by village assemblies for each village and they execute their functions independently on cultural matters and in coordination with the CAMC with regard to resource use (Rayamajhi 2009).

The forest area in the ACA covers approximately 150 ha in three wards of the Lete VDC. The conservation area forest management sub-committee (CAFMSC) consists of 77 member households, with a population of 384 people, and has 11 executive members (five members are female). This sub-committee was registered with the CAMC under ACAP in 1999. The management of the forest area is decentralized to the CAMC with responsibilities delegated to this forest management sub-committee. The sub-committee has a written constitution and operational plan for regulating the use of the forest and other natural resources. They have rules for assessing the timber demand, issuing timber permits, marking trees for felling, and monitoring and supervising conversion activities. Rules related to the use of a number of forest products are strictly enforced and punishments are imposed for those who violate the rules.

The majority of the population (60 percent) belong to the Thakali, who are known as the "best" business people of the high hills, and originated from the Thak Khola region of the Mustang District in the Dhaulagiri zone of Nepal. Other caste groups are the BK, shoe makers and *magar.*

Two main forest products directly attached to people's livelihoods in Mustang District

Some of the members in Lete village identified two forest products, fuelwood and seabuckthorn, as

the primary forest products that contributed to their livelihoods in the area under the conservation area forestry (CAF) initiative.

Because of the cold climate, local people heavily depend on fuelwood for heating their houses. Almost all households use fuelwood for cooking. Many poor and dalit families make their livelihoods by selling fuelwood collected from forests located about one to two km away from their settlements. They are allowed to collect fuelwood from the dead trees and fallen branches and twigs. Most Thakali households are involved in business and those who have restaurants and resorts buy fuelwood from the collectors. Some families migrated from other parts of Nepal to Lete for work. Fuelwood collection is the main work for such people. They make fuelwood by cutting dead wood logs from the standing trees using an axe, in place of a saw. This practice is still used from olden times. Laborers involved in cutting big trees are paid relatively higher wages compared to other labor work, such as farm cultivation and grass and fodder collection. One of the fuelwood cutters is Mr. Hira Bahadur Gurung, who migrated to Lete village 10 years ago. He has a family with three children and his house is made of stone and thatch roof. He earns at least NR 500 a day, enough to buy food, clothes, and other basic needs for his family. He earns more than the existing local rate for fuelwood collection of NR 25-35 per hour (or about NR 200-280 a day), because he usually gets contracts from local hotel and resort owners to make fuelwood from larger dead wood logs, and not from small branches and twigs. He said fuelwood cutting was a lucrative business for him since he first moved to live in Lete village. There are 5-10 other households (out of 77) who are dependent on fuelwood and NWFP collection in the village. More than 16 percent of the household's income came from fuelwood.

As related by some villagers, the CAFMSC has strong rules and regulations to prevent over-harvesting of forest resources including timber, fuelwood, fodder, and NWFPs. No one is allowed to cut fuelwood and timber within a vicinity of one to two km from the conservation area. Beyond the limits, the users can apply for permits from the sub-committee to collect fuelwood, dead wood, fodder, and NWFPs. They pay a specified amount of royalty to the sub-committee. If somebody is found guilty of violating the rules, the person will be fined by the sub-committee based on the rules. At least two sub-committee members visit the forest area every day to monitor and do patrolling. In this way, the forest is protected from degradation.

Seabuckthorn's support of people's livelihood in Lete village

Seabuckthorn is a deciduous, nitrogen-fixing thorny shrub naturally growing in Lete area and other parts of the country's high hills. Seabuckthorn has multiple values including medicines, food, fodder and fuel wood, biodiversity conservation, and soil conservation.

Though seabuckthorn has multiple purposes and is a vital species for upland rural poor, it is one of the least known, unexplored, and underutilized plant species in the Nepal Himalayas (TISC 2001). The high mountain areas in Nepal, where seabuckthorn natural stands are found, face severe development problems. They have poor regeneration (Ibid.) due to various factors, i.e., extreme coldness, human interference, glacial flood effect, high velocity wind, and improper harvesting of the plant. The seabuckthorn forest is also declining due to fire and open access grazing and cutting (Koirala 2002). Many studies (Hilbert 1997; TISC 2001; Koirala 2002; Baral 2006) reveal that local people are underutilizing the plant products, harvesting the fruits traditionally, and over-cutting the shrub, thus hugely exhausting the resource base.

The villagers have yet to harness the rich potential of seabuckthorn to produce food, medicines, juice, and cosmetic products. Considering these values of seabuckthorn, ACAP is helping the people in Lete and other areas in Mustang District, to manage and make more practical uses of the seabuckthorn, such as using its wood for fuelwood, its fruits for manufacturing juice and concentrates, and its foliage for fodder, green manure, and beddings of livestock.

The Taramukhi Women Group was formed a few years ago and is involved in the Lete conservation area. The group helped to set up a seabuckthorn nursery in the village and produced 700-800 seedlings. Some of the seedlings were already planted in degraded forest lands.

Every year, the forest is open to people for three to four days to collect seabuckthorn fruits. Each household is allowed to visit the forest to collect seabuckthorn fruits based on a rotational basis. Many households, particularly the poor and deprived ones, visit the seabuckthorn forest for their collection of fruits in winter (November to December). Each household earns about NR 2,000-2,400 annually by selling seabuckthorn juice to the nearest market. Various government and non-government institutions are involved in promoting seabuckthorn in the study area, ACAP being the main supporter. Recently, the Taramuhki Women Group brought a juice extraction machine to increase the juice production and also their income.

Forest sector contribution to household incomes

Distribution of income across ecological regions

Forest income is considered a very important source of income among all economic classes in the study area. For all households across the three ecological regions, forest income accounts for 26 percent of total income (Table VII.9). The highest percentage of forest sector income was seen among the households in the middle hills region compared to those in the high hills and inner terai regions. It is attributed to the effectiveness of the implementation of two forestry programs, including community forestry and the leasehold forestry program. In terms of absolute income, however, it is almost same in the high hills and middle hills. Of the various forest products, households in the high hills have the highest proportion of fuelwood contribution (16 percent) to the household economy. Timber contribution is generally low: 9 percent in the middle hills; 7 percent in the terai region; and 1 percent in the high hills. The dependency on forest products is highest among households in the middle hills (31 percent), followed by those in the high hills (26 percent), and terai (21 percent). Compared to the per capita income of Nepal (NR 15,162) (NLSS 2004), the average income in all the three site falls below the poverty line.

Table VII.9. Farm, forest and off-farm income per year per household

Income sources	Dang (Inner Terai)		Pyuthan (Middle Hills)		Mustang (High Hills)		Total	
	NR	%	NR	%	NR	%	NR	%
Farm Crops - Crops	8,789	11	11,157	15	13,138	18	11,028	15
- Fruits and vegetables	5,633	7	6,854	9	5,938	8	6,141	8
- Livestock	14,225	18	7,500	10	3,450	5	8,392	11
Sub total	28,646	36	25,511	35	22,525	31	25,561	34
Forestry - Timber	5,375	7	65,266	9	625	1	4,175	6
- Fuelwood	5,448	7	7,168	10	11,969	16	8,195	11
- Fodder	999	1	4,070	6	1,625	2	2,231	3
- Leaf litter	250	0.32	1,016	1		0	422	1
- NWFPs	4,281	5	3,854	5	4,642	6	4,259	6
Sub total	16,353	21	22,634	31	18,860	26	19,282	26
Off Farm - Pension	834	1	2,400	3	3,156	4	2,130	3
- Salary and Remittance	19,791	25	6,510	9	8,281	11	11,527	15
- Business	12,115	15	12,780	18	19,702	27	14,866	20
- Labor	1,136	1	2,850	4	781	1	1,589	2
Sub total	33,876	43	24,540	34	31,921	44	30,112	40
Grand Total	78,875	100	72,685	100	73,307	100	74,956	100

Source: Field survey 2011, NR 71 = US$1 and per capita income according to NLSS, 2004 is NR 15,162

It is not surprising to note that the high hills have the highest percentage of income from off-farm sources. This is because the majority Thakali caste have their own businesses including lodges and restaurants catering to foreign trekkers, which is a well-known tourist activity. They also have small business such as teashops, mule transport, liquor distillery, local trades, and other skill-based activities. The location of Lete VDC on a main trekking and pilgrimage route allows for diversification of income opportunities. The bulk of the labor needs for the lodge and restaurant businesses, including fuelwood cutting, is sourced from outside the district.

Distribution of income among well-being classes

Income inequality is common in Nepal. In this section, the income differences in four well-being classes of people across various income sources is assessed, with particular focus on forestry income (Table VII.10). The results revealed that overall contribution from forestry sector is highest among ultra-poor households (40 percent), followed by the poor (26 percent), medium (24 percent), and rich households (16 percent). However, the absolute income from the forestry sector is higher among medium and rich families. Comparing income from timber, the rich households derive the highest proportion (7 percent) of their income, although this is almost the same (6 percent) for the medium and poor household groups. The ultra poor group benefits the least (2 percent) from timber. In terms of NWFP and firewood distribution, the ultra poor received the highest percentage of total household income (Table VII.10).

Table VII.10. Distribution of income by wellbeing class

Income Source	Wellbeing classes							
	Rich (Whole-year food sufficient)		Medium (Food sufficiency: 6-11 months)		Poor (Food sufficiency: 3-6 months)		Ultra poor (Food sufficiency: < 3 months)	
	Income (NR)	%	Income (NR)	%	Income (NR)	%	Income (NR)	%
Farm Crops - Crops	18,150	15	11,427	13	4,519	7	2,291	6
- Fruits and vegetables	3,997	3	5,208	6	5,125	8	4,070	11
- Livestock	9,653	8	9,322	10	8,606	13	1,354	3
Sub total	31,799	26	25,956	29	18,250	28	7,715	20
Forestry - Timber	8,437	7	5,464	6	3,854	6	755	2
- Firewood	3,982	3	8,754	10	7,148	11	10,245	26
- Fodder	2,602	2	2,149	2	1,966	3	2,040	5
- Leaf litter	390	0	342	0	615	1	226	1
- NWFPs	4,312	4	4,875	5	3,074	5	2,320	6
Sub total	19,724	16	21,583	24	16,656	26	15,586	40
Off Farm - Pension	4,667	4	4,822	5	2,596	4	0	0
- Salary and remittance	29,615	24	19,500	22	5,209	8	2,991	8
- Business	37,179	30	17,571	20	14,791	23	11,733	30
- Labor	0	0	0	0	6,696	10	714	2
Sub total	71,461	58	41,893	47	29,293	46	15,438	40
Grand Total	122,984	100	89,432	100	64,199	100	38,739	100

Source: Household survey 2011.

Outlook for forestry and poverty alleviation

Despite political instability and other difficulties, Nepal is making progress in achieving the MDG 1 target on poverty reduction in 2015. Nepal's three-year approach plan is to reduce poverty to 21 percent. The poverty rate by the end of 2010 was 25.4 percent, down from 31 percent in 2005. The reduction of 5.5 percentage points in the last five-year period is laudable. If existing efforts are continued and prevailing trends persist, Nepal will be able to achieve MDG targets in 2015. To achieve the MDG targets and three-year approach plan (2011-2013), the forestry sector's contribution is vital. Access to equitable benefit distribution is vital to reduce the gap between the rich and the poor. Nepal should critically assess the disparities between and across different ethnic, gender, and wellbeing groups. The outlook (future projections) for the forestry sector's contribution to poverty reduction is very important. This outlook will provide feedback and choices for the policy and decision makers.

In Nepal, various forest governance modalities have been piloted. The institutional systems involved in the forest governance modalities are very complex. Community forestry is popular in terms of governance and institutional development aspects. The leasehold forestry model is considered to be a good strategy for degraded land rehabilitation and poverty reduction, whereas conservation area forests are meant for protection of forests and other biological resources. A major challenge in the coming years, in terms of poverty reduction through the implementation of these various institutional modalities, would be in the mediation of the differing views of diverse interest groups in the forestry sector and to channel their energies into productive forestry activities.

Community forestry scenario

The community forestry program provides more "space" for marginalized users to participate in decision-making through innovations to processes and institutional arrangements, especially nested (small and community-based) decision-making. The increase in space for marginalized users' voices is very important for getting and sustaining their interests in the CFUG agenda in the long-term. However, there will be a fear of overexploitation of forest resources if the government is unable to monitor the forest resources given its inadequate personnel. Strengthening the coordination between government staff and community forestry officials will help sustain forest resources. The government's reluctance in promoting the community forestry program in the terai region needs to be re-thought since the CF program implemented in the study district has been making progress. The reluctance on the part of government to promote the CF program in the terai is primarily political, as government fears the destruction of the quality and high value *Shorea* forest.

There is also the question of equitable participation and representation of the poor and deprived members in the CFUG committees. Some of the leadership positions (vice chair and secretary) are occupied by women and marginalized group members in the CFUG committees, but this is not always ensured. An increase in leadership positions for women and the poor is necessary for ensuring a change in the actual "space" in decision-making, a challenge for the CFUGs to sustain in future.

The community forestry handover process is currently slow and is concentrated in the middle hills. The high hills and terai regions have not received enough attention in terms of CF program implementation, which should be considered in future CF program implementation.

Leasehold forestry scenario

The marginal and degraded forests handed over to poor people have not benefited them as expected by government and other stakeholders, including donors and bilateral agencies. Because of this, the leasehold forestry handover process will also be slowed down. There should be a provision in the law that the productive forest can also be handed over to poor people. In this case, a strong monitoring mechanism has to be developed.

Although there are set criteria for the selection of households eligible for the leasehold forestry program, the selection process may not always rigidly follow these. With the inclusion of the elite in the LFUG,

there is a greater chance of program failure in the future. The government of Nepal needs to deliberately send circulars to the concerned DFO and District Livestock Service Office to avoid elite inclusion in the group and the enforcement of such regulations should follow local people's decisions.

The contribution of the LF initiative to land rehabilitation, control of soil loss, and environmental improvement has not been considered part of poverty alleviation until recently. The government of Nepal should recognize and count these values in the GDP, so that the MDG and the three-year approach targets are achieved.

Conservation area forestry scenario

The agency involved in the management of forest resources in protected area forests is the Department of National Park and Wildlife Conservation, with its conservation area program, along with the conservation area management committees. CAMCs are relatively larger entities to look after the forest resources within their respective sub-committee areas. People's interest and trust in such a system may dissipate. To increase the social and environmental performance of conservation area forests, these stakeholders for forest resource management need to support the achievement of the targeted goals. The community forestry approach within the conservation area is emerging.

Timber and industrial wood products

It is obvious that the demand for all industrial wood products (particularly logs) will increase significantly as the country moves to timber commercialization. In one district, an average of 50 or more sawmills and furniture enterprises exist. This trend will increase with quality production of sawn wood products. Despite a considerable production of timber and industrial wood products, Nepal will be increasing its imports of industrial wood products. However, there is likely to be some significant local deficit of industrial wood products because of local forest degradation. This will be exacerbated by anticipated consumption of timber through rapid urbanization. The country will face severe pressure on its wood supplies. The contribution of timber to poverty reduction has been found to be less than NWFPs contribution, and it is skewed toward richer people. The contribution of timber to household economies will be even reduced. However, the current skewed distribution or gap in contribution of timber between the rich and the poor will be minimized. It means more and more poor people will be involved in commercial timber processing through participation of both private and public sectors.

Fuelwood energy, NWFPs, fodder and grasses

Considering the increasing use of fuelwood due to population growth, the demand for fuelwood is likely to increase. With increasing forest degradation, fuelwood will be sourced from private lands with multipurpose tree growing. Currently, the energy demand being met by fuelwood is more than 80 percent in the high hills, 64 percent in the middle hills, and more than half in the terai region. The role of alternative energy (solar and bio-fuel) is increasing. The current contribution of fuelwood energy to the GDP is moderately significant (11 percent), and is expected to increase by another 5 percent in 10 years. Strategic policy support and action will be required if wood energy programs are to become core elements of the energy and economic development planning.

Until today, NWFPs are mostly used in raw form and in traditional ways. NWFPs are likely to be moving toward commercialization as various agencies and groups show great interest and commitment to support the development of NWFP processing plants. The commercialization will further exploit the NWFP resources available in the forests. There is a critical need for integration of some high value NWFPs into the agriculture cultivation. This will reduce the subsistence use of NWFPs with emerging alternative sources of income. People involved in subsistence use of NWFPs will slowly decrease and shift to commercial work. This is demonstrated the shift of raw seabuckthorn use to improved processing enterprises in the high hills. In terms of poverty reduction, the current status of NWFP contribution to household economies (6 percent) will increase by at least 10 percent in 2020.

With rising livestock populations and secure income from the livestock sector, the exploitation of fodder and grasses from the forests will increase. People will be seeking to introduce new grass and fodder species in their farmlands. This will be adopted more by people from the middle and low economic classes who do not have alternative livelihood opportunities. There is broad consensus among recent studies that the fodder and grasses carrying capacity is far below the actual requirements. The forest so far can supply about 52 percent of the fodder and grass needed and this will be reduced by another 10 percent. The gap will be fulfilled by private fodder and grasses plantation. The direct contribution of fodder and grasses to household income will increase with indirect benefits (such as meat and milk production) from fodder production in private lands.

Forests' environmental services and carbon payments

Nepal has not been able to capture the full commercial potential from the conservation of its environmental resources. The benefits accrued from potential decrease in soil loss through forest management activities, biodiversity conservation, land rehabilitation, and increase in carbon stocks have not been assessed. Greater efforts are needed for the communities in and near the forests, especially the poor, to benefit commercially from these resources. The potential to conserve more biological resources in the future will be constrained by various factors including government commitment and mandate, population pressure, livestock, and technological developments. There is no need to increase the protected areas in Nepal as these already cover 23.1 percent of the total land area, of which forest area is 15 percent. The benefits from carbon capturing will increase substantially. But the exact scenario can be assessed upon government's commitments and action in the next two to three years. The results of the action will depend on the decisions made through international negotiations, which could be a major investment opportunity for the forestry sector in Nepal.

Conclusion and recommendations

Findings of the study lead to the overall conclusion that the forest sector has a significant contribution to reducing poverty in Nepal, though the level of contribution varies across sites and forest program modalities and also type of valuation methods used. The conclusion in terms of the forest sector contribution to poverty reduction is discussed with respect to the four dimensions or pillars of PRSP (2002-2007).

1. Enhance economic growth: At the local level, the study revealed that some initiatives in community forestry, leasehold forestry (the commercial component of establishing a furniture-making shop) and conservation area management have contributed to increasing the income of rural poor households. This contribution is, however, varied across ecological zones. For the sample in the middle hills, the overall contribution of forest-based activities is almost one-third (31 percent) of their income. For the sample in the high hills, the contribution of the forest-based activities is about one-fourth (26 percent) of their income and for the sample in the plains, the contribution is about one-fifth (21 percent). Forest resources are contributing considerably to reducing seasonal shocks and vulnerabilities as well as providing a safety net to the poor households for meeting subsistence needs of fodder, firewood and NWFPs.
2. Social sector and rural infrastructure development: Community forestry initiatives have contributed to the development of needed rural infrastructure in the case study sites. The notable examples include support for school building construction (almost NR half million in Jaspur CFUG in five years), potable water systems, and trail or road construction. Conservation area forests have also contributed to the rural infrastructure work.
3. Targeted program: There is are efforts to prioritize the poorest of the poor households for support under the leasehold forestry program. Trees, however, need a few years to grow before the benefits (in the form of timber, fuelwood, fruits, fodder) can be realized. Nonetheless, fodder and grass harvested from the leasehold forests have supported the

villagers' livestock animals. Another example of targeting benefits to the poor is providing deserving students from poor and marginalized families educational support, as being implemented by the Basanta Hariyali CFUG of Dang District.

4. Good governance: Community forestry is providing not only economic benefits to the rural poor people, but also a venue for them to participate in forest management. CFUG members are more responsive, and funds are being used in a transparent way. Participation and representation among women and the poor have been increasing over time. However, their election into leadership positions remains low.

General recommendations

1. It is apparent that most of the firewood, timber, fodder and NWFPs are used by local people but are not sold. This needs to be also accounted in the present calculation of the economic contribution of the forestry sector. This would increase the contribution of this sector to poverty reduction significantly. Until today, the government has not done such calculation for defining forestry sector contribution to poverty reduction. The depletion of forest resources is also ignored both in physical and monetary terms. The study identified these deficiencies in the current national income and forestry accounting framework.
2. It is easy to calculate the value of timber, fuelwood, fodder and other forestry products that are directly used and marketed locally and internationally. However, for non-marketed forestry products such as fodder, leaf litter, firewood, and unofficial trade of NWFPs, one needs to account market substitution or willingness to pay methods for valuation, which is lacking in the valuation of existing statistics of the government.
3. Other economic contributions such as stone and sands from forests, forest-based tourism/ trekking, timber-based industry, eco-benefits, bio-fuels, water recharge due to forestry, carbon sequestration and oxygen release by trees need to be considered in the calculation of the overall contribution of the forest sector to the national economy (i.e., GDP).

Site specific recommendations

Sites I and II: community forestry initiative

1. The issue on income inequality between the rich and the poor needs to be addressed by providing more space and access rights to poorer households. The provision of allocating 35 percent of CFUG income to identified poor households should be strictly enforced by the CUFGs and monitored by the government.
2. The leasehold forestry concept should be integrated into or implemented within community forestry to provide more access rights to poorer communities.
3. The gender and social inclusion strategy should be effectively implemented by ensuring participation of at least 50 percent women and disadvantaged members in the CFUG committee.

Site I: commercial forestry initiative

1. The small business which the freed bonded laborers started two years ago with some capital investment has currently generated some capital including equipment, raw materials and a work place. However, these people are not self-sufficient in running the sawmill business with such a small investment. Therefore, it is recommended that access to loans for poor and deprived people for forest-based commercial activities be supported.
2. Business skills training is needed for local people who are involved in forestry enterprises.

Site II: leasehold forestry initiative

1. It is evident that the handing over of small and degraded plots to poor households is not cost-effective in many ways. This has increased the work burden to poor members. This

needs to be re-assessed and alternatives should be explored. There should be a provision in the law that the productive forests can also be handed over to poor people. However, in this case, a strong monitoring mechanism has to be developed by the agencies concerned.

2. It was raised that the six households who got the forest lands on lease were not all the poorest of the poor. There is a need for participatory identification of the households for the leasehold forestry program to better target the poorest of the poor.
3. Goats provided by the project in the form of grants to poorer households helped increase their income level. However, this has created dependency and the poor expect such support every time. Another form of support could be in the form of interest-free loans so that the borrowers feel that they have earned the money from their own labor.
4. The livelihood improvement program for the forest-dependent poor and indigenous ethnic groups should be launched with provision of forest enterprise development funds.

Site III: conservation area forestry initiative

1. CAMC's jurisdiction sometimes overlaps with that of VDCs and DDCs, particularly on taxation, use of natural resources and development priorities. The changing political context is exerting pressure for CAMCs to become more participatory, transparent and accountable so that the money generated in conservation areas will be effectively utilized for poverty reduction purposes.
2. The funds generated by the conservation area forest are mainly used for social and infrastructure activities such as trail improvement, school and community building construction. Their use in income generation activities is low. Therefore, there should be some provision in the law to use such funds for livelihood improvement activities of the poor as that of the community forestry initiative.

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VIII

The contribution of forestry and poverty alleviation in Papua New Guinea

Gae Yansom Gowae*

Introduction

It is generally estimated that in Papua New Guinea (PNG), about 97 percent of land and 99 percent of forests are customary owned and more than 80 percent of the population live in rural areas and depend on these lands and forests for their livelihoods. This societal structure was well-recognized from the colonial period up to the country's independence in 1975 and subsequently guaranteed in the Constitution.

Major forest policy changes have been targeting effective participation of customary forest owners in the development of their forest resources to improve their socio-economic status and thus their living standards. Apparently, there have been great mixtures of outcomes. Customary landowners either become worse off with the loss of their forests for subsistence living, or better-off with re-investments into other alternative land uses in agriculture. However, often during major natural phenomenon like drought, flooding, and cyclones, those without forests suffered more than those with forests for protection and sources of food.

The forestry sector provides major revenue-earning opportunities to the government, as well as to customary forest owners. But questions on how well these revenue earnings are translated into improved living standards of the majority of the people, particularly those affected by the development of these forests, are not clearly answered. The government's recent development strategies (PNGDSP 2010-2030 and MTDP 2011-2015) recognize the forestry sector as an important sector that will continue to contribute immensely to the national economy as well as to the improvement of the livelihoods of rural people.

This study reviews the impacts of forests and forestry developments towards poverty alleviation in the country. Poverty alleviation in this case is assessed using the composite Millennium Development Goal (MDG) index as individual data on poverty indices are not readily available at the sub-national level, a situation well highlighted in PNG's first MDG report of 2004 and the second report in 2009.

Extent of forest resources

PNG hosts the third largest intact tropical rainforests in the world. These forests and forestry have played an important role in the livelihoods of the people of PNG for many years. The forests have provided a source for food, fruits and nuts, building materials, medicinal plants, habitats for refuge, and a wealth of other services (FAO 2009).

* School of Physical and Natural Sciences, University of Papua New Guinea, Papua New Guinea.

Shearman et al. (2008) estimated that the initial total forest cover in 1972 was 33.2 million ha (72 percent) and by 2002, about 28.3 million ha (61 percent) of the land was still under forest cover. Of this, about 25.3 million ha (55 percent) was still intact while about 2.9 million ha (6 percent) was degraded between 1972 and 2002. FAO (2010) estimated that the initial forest cover in 1975 was 33.7 million ha (73 percent), and by 2010, about 28.6 million ha (62 percent) was still under forest cover, of which about 24 million ha is still intact. The last national forest inventory, conducted by PNG Forestry Administration (PNGFA) in 1996, provided an estimation of 30.7 million ha (66 percent) of total forest cover remaining. Obviously there are inconsistencies in the estimates of remaining forest cover.

Of the 33.7 million ha of total forest cover, PNGFA estimated that about 15 million ha were considered accessible commercial forest areas, and by 2010, about 12 million ha were acquired by the State through PNGFA, for which about 10 million ha were allocated under timber permits (TPs). It is therefore estimated that at the end of 2010, about three million ha of accessible commercial forests remain while two million ha of accessible commercial forests are yet to be issued timber permits. It was also estimated that by 2010, about 4.5 million ha were logged-over forest areas (PNGFA 2009). The state of these logged-over forest areas is not known.

Using FAO (2010) figures, it would be estimated that at the end of 2010 about 18.6 ha of forest were intact, of which 13.6 million ha would be inaccessible, three million ha not yet acquired by the state from the customary land owners, and another two million ha already acquired but not yet allocated to developers. FAO (2010) and Shearman et al. (2008) both suggested that forest cover under other wooded-type forests (swamp, mangrove and dry evergreen) comprised 4.5 million ha and remain unchanged. This suggestion could not be verified as there is no data available on the extent of disturbances and clearance of these forest types.

The PNG report for the United Nations Framework Convention for Climate Change (UNFCCC) during the Countries of Parties meeting 11 (COP11) in 2005 indicated a deforestation rate of 4.54 percent, with subsistence farming as the main leading driver (33.9 percent), followed by mining (19.5 percent) and logging (18.2 percent) (UNFCCC 2006). FAO (2005) estimated the rate of deforestation to be 0.5 percent. Shearman et al. (2008) estimated that 1.41 percent of PNG's tropical forests were being deforested or degraded annually between 1972 and 2002. FAO (2010), however, indicated a rate of 0.3 percent deforestation rate annually between 1990 and 2010.

Subsistence farming as the main driver is quite contrary to the claims by Bourke and Harwood (2009) and Filer and Sekhran (1998) that agricultural practices in PNG were more intensified than clearing new forest areas. Given these inconsistencies in both the estimates of the remaining total forest cover areas and the deforestation rates, FAO (2009, 2010) recommended the urgent need for a national forest inventory, since the last national forestry inventory was undertaken in 1996.

Forest ownership and management

PNG is a predominantly tribal country and ownership of land and forest resources is communal. Forest ownerships are strongly linked to the two land tenure systems: State land tenure and customary land ownership. Forest ownerships under State land tenure system are generally classified as public ownership. In the large commercial forestry activities on customary land, States only acquired the rights over trees. Where there is a forest concession or forest plantation, the rights over the trees are then vested in either the State or the private entity, but the land rights is with Indigenous Peoples (FAO 2010).

Allocation of tenure over forest resources through State acquisition for industrial and commercial forestry purposes was through the Timber Rights Purchase (TRP) mechanism under the old legislation, the Forestry Ordinance 1936. This was replaced by the Forest Management Agreement (FMA) mechanism under the current legislation, Forestry Act 1991. The TRP mechanism allows the State to acquire the rights to harvest only the trees, whereas under the FMA mechanism, the State acquires the rights to harvest the trees as well as manage the residual forests for the next cutting cycle. The tenure period for the TRP mechanism ranged from 5 to 15 years and was considered a medium-term lease arrangement, whereas the FMA has a minimum period of 35 years and is

considered a long-term lease arrangement. Each mechanism was crucial for forestry development in the country and also for rural development and poverty alleviation.

Under the TRP and FMA systems, infrastructure developments like roads and bridges including wharves, classrooms, and health centers were negotiated and established in rural villages during the tenure period. The FMA is an improvement over the TRP system, which includes agriculture and reforestation levies, and others. These levies provide financial incentives for spin-off activities in agriculture and forestry. Results and impacts are mixed for both TRP and FMA systems.

The Local Forest Area (LFA) mechanism on the other hand, was allowed under the Forestry (Private Dealing) Act 1971, where customary forest owners were granted rights to apply to have their forests declared a LFA and sell their timber directly to outsiders, subject to the approval of the Forest Minister. The LFA mechanism, through the landowner company concept, however, appeared to be very abusive in terms of resource exploitation, loss of benefits, and environmental destruction. Although the concept was good for promoting self-reliance and social and economic development at the community level, the execution and the quality of leadership and management were very poor and centered on a few self-appointed and so-called landowner representatives and left the majority of the landowners locked out in terms of loss of benefits and environmental destruction (Barnett 1990).

A major challenge that still remains is the effective management of forests under customary ownership. The Barnett Inquiry (1990) into the allegations of rampant corruption in the forest industry sector and the ODI (2006) report revealed that effective management and planning, including benefits-sharing under clan arrangements through the Incorporated Land Group (ILG), appeared problematic. Planning and management of forest resources under such arrangements have sometimes resulted in over-cutting, resource depletion, unintended environmental impacts, and uncertainty about the long-term capacity of forests to supply the future needs of local communities or industry. Development and use of forest resources is seen by most sectors of the community as an integral component of national development. However, accommodating diverse community interests in planning forest development and the application of sustainable forest management (SFM) principles are significant challenges (Amos and Gowae 2008). Even more challenging is evaluating the impact of forestry development at clan level.

Poverty situation

Poverty is generally defined as deficiency of elements or resources that are needed or desired, or that constitutes richness. It is the quality or state of being poor or indigent. Poverty deprives people of their security and wellbeing, of not only safe water and adequate food, clothing and shelter, but also education and healthcare. It takes away people's rights, and their freedom, dignity and peace of mind, and puts people's lives in danger and robs them of their future.[1]

PNG's Medium Term Development Strategy (MTDS) 2005-2010 described the poverty situation in PNG as *relative poverty* rather than *absolute poverty*. The MTDS 2005-2010 recognized that while absolute poverty is not widespread, a significant proportion of the population is affected by relative poverty. Absolute poverty implies no livelihood based-support or means (e.g., no food, water, finance) and people continuously live in that circle without any chance of getting out of the circle, whereas relative poverty implies at least the presence of livelihood support (e.g., garden) (Faiteli, personal communication, 2011).

PNG, as well as the rest of the South Pacific Region, considers the MDG concept of "income poverty" which is income-focused (and to a lesser extent "consumption poverty") and in particular the way these concepts are measured, as inappropriate or even offensive. It is widely believed that absolute poverty that exists in many developing countries does not exist in the region, including PNG. Consequently, poverty in PNG is defined in a much broader way based on the concept of "poverty of opportunity", which refers to many areas of life, such as inadequate infrastructure, isolation, and lack of access to

[1] http://www.ThinkExist.com

markets and basic services like health and education. The concept is strongly linked with vulnerability and lack of access to services and choices (MDGR 2009).

PNG's 1st MDG Progressive report (MDGPR) in 2004 reported that in spite of the continuing emphasis of the government on poverty reduction, the very limited evidence suggests that the proportion of people under the national poverty line has not changed significantly during the last two decades (1980-2000). The report was based on the 1996 Independence Household Survey which estimated that 30 percent of the population lived under the lower poverty line of US$ 137 over the period. This baseline figure was adopted in the MTDS (MDGPR 2004). The national MDG 1 target under MTDS 2005-2010 was to reduce the proportion (30 percent) of the population living under the lower poverty line to 28 percent by 2009 and subsequently to 27 percent by 2015, which is still far higher than the global target of 15 percent by 2015.

The progress towards achieving the poverty component of MDG 1 was monitored through several proxy indices associated with "poverty opportunity." It appears that since the 1990 MDG base, the combined impact of all these proxy indices led to a small improvement of about five to 10 percent in the poverty situation. This improvement is approximately the same as that envisaged by the National Target 1 included in the 2005-2010 MTDS. With regard to the rather modest national targets, PNG is more or less on track in 2009. However, none of the far more demanding global targets of MDG 1 can be achieved by the 2015 deadline. The continuing very high Gini coefficient (0.51) is a clear indication that improvement in the poverty index does not necessarily translate into development in which the citizens of the country share equally.

PNG's 2nd MDG Report for 2009 reported that the measurement on the eradication of extreme poverty and hunger was hampered by the fact that since the 1996 Independence Household Survey, no new information on income and consumption has been available. Monitoring of the poverty component of MDG 1 was carried out using a "basket of proxy indices" related to education and literacy, labor force participation, longevity, household facilities, etc. Based on these data, it was concluded that there was a marginal decrease in "poverty of opportunity." The decrease is approximately the same as that envisaged in the country's 2005-2010 MTDS (MDGR 2009).

Forestry and poverty situation

The forests have played a vital role in maintaining the health and wellbeing of the majority of the population and providing them with the means to live, and more recently, to generate income (Shearman et al. 2008). The PNGFA annual reports (2007-2010) indicate that the forestry sector contributes on average between US$ 10-14 million annually to the rural sector in terms of timber royalties to customary forest owners. The forestry sector also brings in social infrastructure development, such as roads, bridges, schools, and health centers to rural areas. These infrastructure developments provided the proxy indices of "poverty opportunity" as described and were used in measuring poverty indices in PNG.

Table VII.1 provides a simple comparative analysis of poverty alleviation using the relationships between the size of land, forests and timber royalties, and population size to the MDG composite indices and the HDI by province. The 2004 MDG composite indices and HDI are used here to assess impact, as there are no update indices available. The table is arranged in descending order of the proportion of forest areas to the total land area. The MDG indices and HDI are also given their rankings in brackets for comparative purposes between the provinces. The timber royalties paid between 2007 and 2010 were also provided for those provinces that PNGFA collected timber royalties from during the period to assess the impact. Given the significance of land and forests to the people of PNG, the table aims to portray whether the sizes of land forests influenced the MDG composite indices and the HDI for each province.

Table VIII.1. Total land area with comparative forest size and the composite poverty indices by provinces

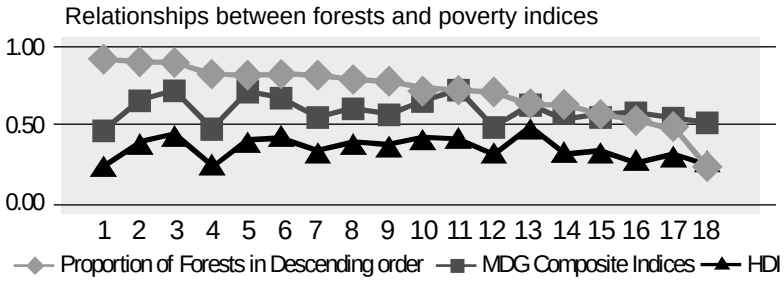
Province	Total Land area (ha)	Total Forest Area (ha)	**Population** (2000 census)	Timber Royalties (2007-2010) (US$)	MDG composite indices (2004)	HDI (2004)[2]
West Sepik	3,604,000	3,365,100 (93%)	185,741	12,703,803	0.478 (18)	0.252 (18)
West New Britain	2,046,000	1,850,300 (90%)	184,508	7,713,108	0.658 (6)	0.384 (8)
East New Britain	1,536,000	1,373,900 (89%)	432,972	3,322,726	0.723 (2)	0.431 (2)
Southern Highlands	2,569,000	2,143,000 (83%)	546,265	Nil	0.478 (18)	0.274 (16)
New Ireland	962,000	800,800 (83%)	118,350	2,193,547	0.715 (3)	0.398 (6)
Milne Bay	1,428,000	1,182,600 (83%)	210,412	501,515	0.683 (4)	0.420 (4)
Madang	2,907,000	2,366,600 (81%)	365,106	1,347,776	0.557 (13)	0.335 (10)
Northern (Oro)	2,271,000	1,790,900 (79%)	133,065	913,147	0.611 (9)	0.385 (7)
Morobe	3,393,000	2,646,600 (78%)	539,404	1,685,989	0.570 (12)	0.369 (9)
Bougainville	944,100	747,400 (76%)	175,160	No data	0.676 (5)	No data
Central	2,968,000	2,222,900 (75%)	183,983	1,408,978	0.656 (7)	0.403 (5)
Manus	214,900	156,800 (73%)	43,387	493,751	0.727 (1)	0.431 (3)
Gulf	3,465,000	2,484,600 (72%)	106,898	6,869,694	0.489 (17)	0.331 (10)
Western (Fly)	9,854,000	6,672,800 (68%)	153,304	8,101,978	0.630 (8)	0.472 (1)
Chimbu	615,700	405,000 (66%)	259,703	No data	0.574 (11)	0.320 (13)
Eastern Highlands	1,120,000	669,400 (60%)	432,972	No data	0.554 (14)	0.325 (12)
Western Highlands	915,000	478,100 (52%)	440,025	No data	0.587 (10)	0.282 (15)
East Sepik	4,375,000	2,049,800 (47%)	343,181	No data	0.551 (15)	0.304 (14)
Enga	1,177,000	263,700 (22%)	295,031	No data	0.514 (16)	0.263 (17)

Sources: PNGRIS 1996 Kiele, UPNG 2011 and MDG Progress Report for PNG 2004.

It appears that there is no clear trend of relationships between the proportion of forests and the poverty indices, suggesting no impact of the forests on people's living standards. Provinces with a large proportion of forest areas like Sandaun and Southern Highlands have low indices, while those with a small proportion of forest areas have better indices. The same can be said about the relationships between land size and the two indices.

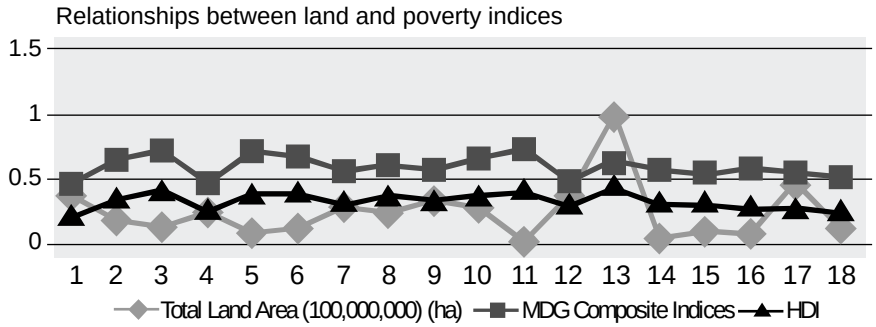
Figures VIII.1 and VIII.2 below illustrate the relationships between the proportion of forests and total area of land with the indices by provinces. The figures confirmed the lack of relationships between the proportion of forest and the total land area with the indices.

Figure VIII.1. Forests and poverty indices



[2] As of the writing of this report, no updated MDG composite indices and HDI for sub-national level (provinces) were available; hence the 2004 figures were used to give some ideas of the trends.

Figure VIII.2. Land and poverty indices



The trend at point 13 is very obvious, representing the Western Province with the largest land area and forest size in the country, though the forest proportion may be relatively less, compared to other provinces. The Western Province trend could be strongly influenced by the multibillion BHP mine closure preparation programs for OK Tedi mine, managed by the PNG Sustainable Development Limited.

Figure VIII. 3: Timber royalty and poverty indices

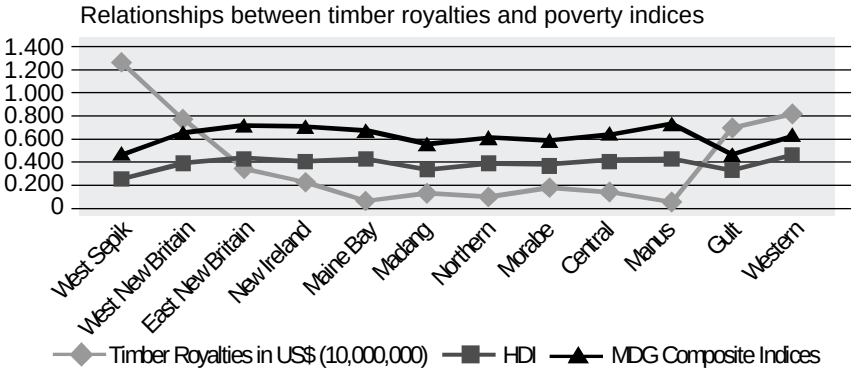
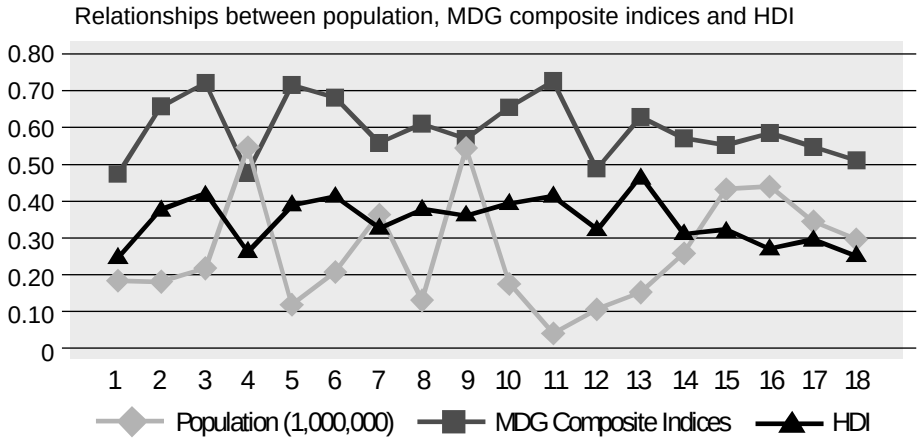


Figure VIII.4. Population and poverty indices



Figures VIII.3 and VIII.4 show the relationships between timber royalties and poverty indices and the population and poverty indices, respectively. There is a strong relationship between population and poverty indices. The relationship suggests that the higher the population, the lower the indices, and vice versa, suggesting that population strongly influences living standards. A higher population leads to low living standards and vice versa. Point 4 in Figure VIII.4 represents the Southern Highlands Province which has the largest population but with the lowest MDG composite indices while point 11 represents Manus Province which has the smallest population but with the highest MDG composite indices. Overall, there are no clear trends to suggest the influence of forests on poverty alleviation. The main constraint of the analysis is the lack of updated information or data on poverty indices since the only data available is from the 1996 Independence Household Survey. PNG as a whole is currently hampered with no updated data for its MDGR as the planned 2010 Independence Household Survey never took place.

National economic development

PNG had an estimated population of 6.7 million people in 2009 and a population density of 14.5 people per km^2. The total gross domestic product or GDP (nominal) in 2009 was estimated to be US$ 7.9 billion with a per capita income of US$ 1,247 (IMF 2010). The 1996 Gini coefficient was 50.9, which reflects a relatively high inequality in income distribution in the country. The human development index (HDI) in 2010 of 0.431 was rated medium and ranked PNG at 137th place out of 169 countries in the world (UN 2010).

PNG's economic development is predominantly dependent on natural resources and the export of raw materials. The main natural resources are in agriculture, forestry, fisheries, minerals, and petroleum. Currently, the economy is dominated by non-renewable resource sectors contributing approximately 80 percent of the total GDP, while renewable resource sectors contribute about 20 percent (MTDSP 2010). The forestry sector contributes about 8.5 percent (ITS 2006). The economic growth in 2011 is 8.5 percent (ADB 2011) with an average population growth of 2.7 percent (AusAid 2009).

The forestry sector is ranked 3rd after mining and agriculture, but its contribution to the rural economy and poverty alleviation is crucial. The sector provided approximately a net of US$ 10.3-13.5 million between 2007 and 2010 in timber royalties to landowners, with an average of US$ 17 million per annum, an increase of 4 percent from 2007 to 16 percent in 2010 (PNGFA 2007-2010). This was a result of the increase in timber royalties from US$ 4 per m^3 for all species to US$ 14 per m^3 for *kwila* (*Intsia bijuga*), US$ 10 for group one species[3] and others at US$ 6 per m^3 (PNGFA 2008).

However, poverty indicators of the provinces with major forest areas do not really reflect the magnitude of revenues generated from timber projects. There is a strong suggestion of poor financial management by forest owners and a lack of fair distribution of generated revenues back to the provinces where the forest resources came from. Recent reports by the National Economic and Fiscal Commission (2011) revealed that some provinces with huge fiscal capacities spent less on basic services, and the trend is that these are the provinces rich in natural resources.

Poverty reduction and forestry in national policy

The GoPNG does not have a National Poverty Reduction Strategy (NPRS) for the country. Instead, the national poverty reduction strategies were integrated into medium-term and long-term development strategies to eradicate poverty and may not necessarily meet the global targets set for 2015.

National poverty reduction strategy

The NPRS was incorporated in the MTDS 2005-2010. The Department of National Planning and Monitoring (DNPM), responsible for MDG compliance, decided to have one document, instead of two. The reason was partly because the National Poverty Reduction Strategic Plan (NPRSP) concept of the World Bank did not align with the government's definition of poverty and therefore, the DNPM produced the MTDS in the context of the PNG situation (Lina,[4] personal communication). These NPRSP views are further translated into PNG's Vision 2050, a long-term strategy supported by PNG's Development Strategic Plan (PNGDSP) 2010-2030. The PNGDSP 2010-2030 will be implemented through four rolling Medium Term Development Plans (MTDP) and the first one is MTDP 2011-2015.

MTDS 2005-2010 was based on the government's program for recovery and development, and its three interrelated objectives of good governance, export-driven economic growth, and rural development, poverty reduction and empowerment through human resource development were also the basis for its development strategy, including good governance, and the promotion of agriculture, forestry, fisheries, and tourism on a sustainable basis. The strategy was to be realized by empowering people, especially

[3] Species groupings by international log exports markets.

[4] An officer with the Department of National Planning and Monitoring (DNPM).

those in the rural areas, to mobilize their own resources for higher living standards. MTDS 2005-2010 was a strategy towards achieving the Millennium Development Goals.

This strategy appears strongly focused on rural development. All the 10 principles interconnect with a focus on rural development, except Principle 5. Principle 8 provides for the facilitation of the strategic impact project interventions in least-developed districts and provinces with a particular focus on the "poverty corridor." The poverty corridor is a regional zoning system of poverty areas transformed into economic corridors of comprehensive and effective networks of transport and utilities, quality education, and health services. Within this region, businesses are able to operate at low cost with design incentives, thereby encouraging foreign and domestic private sector investment. The strategy assumed that while absolute poverty is not widespread, a significant proportion of the population is affected by relative poverty. The strategy acknowledged that poverty is a multi-faceted issue that requires integrated and sectoral responses. Thus, poverty reduction would be addressed by investing in people through education and health and by promoting broad-based economic growth (MTDS 2005-2010).

Papua New Guinea's Vision 2050

Papua New Guinea's Vision 2050 is a long-term strategy that maps out the future direction for the country and reflects the aspirations of its people with a vision of a *"Smart, Wiser, Fair and Happy Society by 2050."*

Vision 2050 emphasizes the effective utilization of PNG's rich natural resources—land, cash crops, forests, and fisheries—to improve its socioeconomic development status. Equally important are other areas that can contribute to economic growth and better living standards for people, including human capital development, an improved infrastructure network, and an efficient service delivery mechanism for public goods and services.

Based on the deterioration of the provision of public goods and services and lack of meaningful participation of the rural people in income-earning activities and their aspirations to do better, Vision 2050 incorporates the National Government's Strategic Directional Statements that will drive development over the next 40 years.

Medium Term Development Plan 2011-2015

PNG's Medium Term Development (MTDP) 2011-2015 is a five-year development plan providing a clear, accountable plan for investment. It sets sector strategies, targets, deliverables and their projected estimated cost implementations. The MTDP is aimed at translating the PNGDSP 2010-2030 into tangible results. It also takes into account the lessons learned and experienced from the previous MTDS 2005-2010. The MTDP outlines the specific players responsible for achieving key deliverables and strengthens the national government's ability to monitor and evaluate investments over the coming years.

MTDP 2011-2015, under its overall objective of economic sector strategies, sets the goal of building a forestry sector that is sustainable and highly profitable. It recognizes that the forestry sector continues to contribute immensely to the national economy as well as to improving the livelihoods of rural people. MTDP also recognizes that the sector operates in the most remote areas of the country, thus creating opportunities for rural communities to engage in formal employment to improve their living standards. Companies involved in the sector have provided the basic social and economic infrastructure services like roads, bridges, schools and health centers. In the absence of government services and support, the presence of the forestry industry in rural communities is vital since it provides some of the basic services which the government should typically provide.

National forest policy

Forest policies, though placing emphasis on rural development and forest owners' effective participation, lack focus on poverty alleviation in the rural areas. Consequently, there is a great

mixture of results in the outcomes and impact on living standards of rural communities after major forestry development, particularly the sustainability of income sources and maintenance of facilities built during the operations.

Forest policies and forestry developments can be seen as products of their times, reflecting the different phases of development and changes PNG has gone through from the colonial era to its experience as an independent nation (Turia 2005 and Montangue 2002 in ODI 2006). However, the major policy developments following the Barnett Inquiry (1990) and recommendations could be seen as imperative approaches towards protective and effective forest management for socio-economic growth. Thus, the overarching objectives of the new Policy (National Forest Policy 1991) are to ensure the sustainability of the forests through proper management practices of forests as renewable resources, and that forests are harvested to bring about economic growth, job creation, increased participation of Papua New Guineans in the forest industry, and further domestic processing (Genia 1991).

The 1991 Forestry Act and Forestry Policy, and the creation of PNGFA and National Forest Service (NFS) in 1993 were believed to be in the new era of customary forest owners' interest following the Barnett Inquiry (1990). The Barnett Inquiry revealed abuses in the forestry industry sector, thus depriving traditional forest owners of their rights and benefits from the development of these resources. However, more than two decades after the Barnett Inquiry, the ODI (2006) report suggested that the trends of abuses and deprivation of customary forest owners are still there.

Forest policy implications

A major conflict in PNG's forest policy that still exists from pre-independence to post-independence and even after the Barnett Inquiry is that while the majority of the forests (99 percent) is customary-owned, the forest resources by legislation design are regarded as national resources and the development of these resources is for the "national interest". This implies that even if the development of the forest resources in the country were 100 percent controlled by the customary forest owners through ILG and landowner companies, the ultimate objective would still be to generate revenues to meet the political aspirations of the current government.

The other major conflict is that while more than 80 percent of the people live in rural areas, more than 80 percent of the timber resources are under State control for large commercial timber-harvesting purposes. The State does not encourage small-scale timber operations in rural areas and does not provide technical and financial support through PNGFA.

Major policy changes were targeting customary landowner participation in the development of their forest resources. However, the record of customary owners' involvement in forestry development to date has been very poor (ODI 2006). Poor management of landowner companies that resulted in uncontrolled logging and destructive timber harvesting practices and pervasive corruption in the logging industry was uncovered and investigated, leading to the Barnett Inquiry in 1987 (Holzknecht and Golman 2009). The Barnett Inquiry reports revealed that landowner company officials, including local politicians, were colluding with Asian timber companies for their self-interests, thus denying their clan and community members the rights to the benefits derived from their resources under the landowner company concept.

The management of timber agreements was very ineffective and customary forest owners lost in terms of infrastructure development. The under-utilization of the levies collected from forest development did not create much impact on customary forest owners and rural communities. In general, forest policy objectives are much broader for the national interest than for customary forest owners.

Past and current contribution of forestry to poverty alleviation

Subsistence use of forests and allocation of tenure over forest resources

Traditional forest management

Traditional forestry and subsistence use of forests continue to be the basis for survival of most people in Papua New Guinea. Currently, around 85 percent of PNG's population still lives in rural areas and depend on forests for their traditional and subsistence living. Forests are still major sources of traditional wealth and cultural inheritance.

However, traditional forestry management and subsistence use of forests are now transformed into modern market commodities to meet the growing demands of people in rural areas. For instance, traditional medicinal plants and other forest produce that used to be cultivated and domesticated through traditional forestry practices are now sold in the informal sector markets for cash income. Firewood, which used be the only source of the energy in rural areas for cooking and lighting, is now also sold in towns and cities for additional cash income.

Therefore, while traditional forestry and subsistence use of forests continue to maintain their traditional values and significance, the erosion of their traditional values and practices also contribute to poverty alleviation in rural areas. This trend of contribution to poverty alleviation will continue to grow as traditional forest values find their way to modern markets and provide cash incomes.

Allocation of tenure over forest resources

Allocation of tenure over forest resources in PNG is through traditional tenure arrangements or formally through the acquisition of timber rights for commercial purposes. The traditional tenure system is generally through cultural inheritance, often a long-term arrangement and passed on to the next kin from generation to generation. This arrangement continues from the past to the present and has a significant impact on poverty alleviation in rural areas because through this arrangement, individuals and families are able to practice traditional forestry and subsistence use of forests and generate cash incomes to improve their living standards. This allocation of tenure over forest resources currently contributes more significantly to poverty alleviation than in the past as individuals and families become more innovative and aware of the commercial values of non-wood forest products (NWFPs).

Allocation of tenure over forest resources through timber rights acquisition has been the main policy strategy in bringing development in rural areas with mixed results. The past trends during pre-independence appeared more effective in terms of distribution of wealth and benefits from the development of the forest resources than the post-independence and current eras as reflected in the Barnett Inquiry Report (1990) and the recent ODI Report (2006). Although the magnitude of the benefits derived from the forest resources during the post-independence and current era may be huge, the impact on poverty alleviation in rural areas is somewhat less impressive compared to the pre-independence era as reflected by the level of services to rural communities. Consequently, there is an urgent need for a major forest policy review to reflect on the current scenarios if PNG is to achieve its poverty eradication strategy as incorporated in its MTDS 2011-2015.

Community forestry

Community forestry was never a concept in PNG, though clan ownership of forests played a major part in benefit-sharing in forestry development. However, community forestry is currently seen as the main mechanism in forestry to alleviate poverty in rural areas. Community forestry through partnership with local communities and NGOs has proven successful in rural areas promoting small-scale downstream processing using portable sawmills and eco-tourism. Such examples included the local-based NGO Foundation of People's Community Development (FPCD) and The Nature Conservancy in Madang

Province. FPCD, which is the only certified forestry management practice in the country under the Forest Steward Council (FSC) certification system, was recently discussed during the International Year of Forests conference on *Forestry in PNG – The Next 40 Years and Beyond*, as a model to consider in sustainable forest management and poverty alleviation in rural areas.

Other community forestry activities, though providing small benefit flows to communities, are possible poverty alleviation strategies in rural areas. These include community forestry activities like afforestation of large grassland areas in the Highlands region, a classic example of which is the One Keto Community Forestry Project.

Family and individual forestry

Family and individual forestry was not practiced in PNG in the past. However, given the increasing population pressure on forest resources to meet increasing demands for modern living, family and individual forestry is slowly gaining popularity for cash income generation in rural areas. In the Highlands and the Island regions where forest resources are becoming scarcer, this practice is now gaining momentum. In the Highlands region, family and individual forestry practices through afforestation of grassland areas are becoming very common, a classic example of which is the Mount Elimbari community in the Chuave District of Chimbu Province. The benefits derived include prevention of soil erosion and sale of firewood and timber.

Family and individual forestry practices are replacing agricultural crops with forestry crops to restore soil fertility from disease and pest infestation, as currently witnessed in the recent outbreak of cocoa pod borer disease in the country in 2008, where families and individuals replaced their cocoa plantations with balsa (*Ochrohoma* spp.) plantations. Many families and individuals suffered badly through loss of income. To completely wipe out the disease, individuals and families are replacing cocoa trees with balsa trees as a short-term measure. This approach also sustains the flow of income for families and individuals from the loss of cocoa plantations.

This trend of forestry contribution to poverty alleviation currently may not be significant, but will certainly be a force as forest resources become scarce and demands for improved living standards in rural communities increase.

Commercial forestry and industrial forestry

Commercial forestry in PNG is dominated by large-scale forest industrial activities and is one of the major contributors to the economy. As incorporated in the government's long-term development strategies for the next 40 years (2050), the forestry sector is important for rural development and poverty alleviation.

Nearly half of the forest resources in the country are classified as commercial forests for industrial logging purposes in which the State, through PNGFA, has a major interest. Large-scale commercial forestry activities contribute to improving rural communities' living standards through infrastructure development and services like health, education and transportation, while at the same generating necessary revenues through timber royalties and taxes to enable the government to effectively undertake its major functions and roles.

However, the government needs to ensure that services are effectively delivered to rural communities. Maintenance and sustainability of the infrastructure and services established during logging have been great concerns in the past and even at present, leading to many criticisms of the logging industry. Government should assist in the maintenance of these infrastructure and services following the cessation of logging operations.

Other small-scale commercial forest activities under community forestry are also contributing through income generation in rural villages and support for community projects such as schools and health centers.

Village industries

Village industries are not given much attention by both rural communities and government agencies. Handicraft production is mainly practiced in rural villages, but not at a commercial level. Major tourism entrepreneurs have established several handicraft shops at main tourist centers or towns. There is also increasing sales of handicrafts by villagers outside main hotels in tourist destinations. This village industry creates opportunities for rural village people to earn income, and a strategy is to link village guesthouses with village handicrafts.

The provinces of East Sepik, West New Britain, Morobe, and Milne Bay are known for handicraft work. The markets for this industry are driven by tourism as local demand for handicrafts is not well-recognized.

Other forms of village industries include small furniture-making business using sawn timber from small-scale sawmills and NWFPs such as bamboo and rattan. These types of village industry activities are undertaken only on an ad hoc basis where need arises. There is great potential in village industries, but the potential is not being fully tapped, partly because of lack of trained skilled people, financial support, steady markets, and transportation to bring the products to the markets.

Smallholder schemes

Smallholder schemes in commercial forestry do not exist, though there are opportunities for eco-tourism using village guesthouses and small-scale sawmill operations. Village guesthouses and small-scale sawmill operators can organize themselves into smallholder schemes to improve their profiles and strengthen their market positions. These organized schemes can easily attract government and international donor organizations' attention for funding support. Some village guesthouses get outside funding support, but only through individual efforts. The government's 2011 budget allocation of US$ 2 million for rehabilitation of guesthouses is an indication of support for such schemes.

Levies collected for infrastructure development from forestry projects can be realigned to support such schemes. Financial support for smallholder schemes in the forestry sector is currently lacking. Smallholder schemes for commercial forestry activities in rural villages are options that can increase participation of forest owners and alleviate poverty.

Non-wood forest products

NWFPs are also not given as much attention as village industries, though in the traditional context, these products are very useful to rural people. NWFPs like rattan and bamboo are used by people in rural areas on a daily basis for traditional construction purposes. However, converting these into marketable products for income-earning will require skills and marketing incentives.

One type of NWFP currently flooding the street markets of towns and cities in PNG are traditional medicines extracted from plants and herbs from the forests. Although there are ongoing debates and public advertisements and notices by the public health department discouraging the sale of these medicines, demands for these traditional medicines are increasing.

There is a great potential in NWFPs for village industries, particularly for medicinal plants and herbs, for which the demand is currently high. However, there is an urgent need for the government to regulate the products through proper processing standards and markets.

Bio-energy

Bio-energy in terms of firewood and palm leaves for lighting purposes is a source of survival for rural communities. In the last two decades, firewood has become an important item in local markets and is a source of income for villages and urban settlement dwellers. Urban settlement communities also rely heavily on firewood for cooking purposes and sell the surplus in local

markets to earn extra income. Firewood is a major source of income for urban settlement communities and helps alleviate poverty in these communities.

Ramu Agri-Industries Limited (a sugar company) recently ventured into large plantations of afforestated grassland areas using *Eucalyptus* species for wood as an alternative energy source for its boiler system. Under its afforestation program, people from surrounding rural communities were employed as laborers in the plantations. Communities were also engaged to sell wood to the company through community forestry. The company provided seedlings free of charge to communities to encourage the afforestation program for fuel energy.

Production forestry

GoPNG views industrial forestry as the major means to develop infrastructure and generate revenues in rural areas, as the majority of the forests are located in rural areas, some of which are very remote. However, the Barnett Inquiry in 1987 revealed widespread corruption and abuses in industrial forestry that deprived customary forest owners of their rights and benefits. Consequently, the situation did not contribute much to the plight of the rural communities in terms of cash incomes, health, education and other services.

Since the Barnett Inquiry and the major policy reforms in the 1990s, various reports (ODI 2006; Filer 2000; Filer and Sekhran 1998) have cited poor implementation of the reform measures to reverse the situations discovered by the Barnett Inquiry. ODI (2006) generally concluded that the most recent piece of legislation, the 1991 Forestry Act, re-asserted the State's monopoly over timber sales, yet conflicts continue to characterize the forest sector, suggesting that an equitable balance has yet to be found and secured under the law. The evolution of the legal framework is still caught between the State's desire to control timber harvesting and the landowners' desire to be involved in the sale of customary-owned assets.

Forest projects provide very tangible benefits in terms of rural service provision in many areas, filling a gap caused by the non-provision of such services by the State. Governance failure has been a noticeable characteristic of the PNG forest sector for the last 20 years. More recently, a succession of Independent Forestry Reviews commissioned by the government continued to question the way timber licenses are issued and subsequently operated (ODI 2006). The 2003-04 review found that logging has little long-term beneficial impact on landowners, although they bear the environmental costs. For many observers, the reforms initiated in the early to mid-1990s are incomplete. The situation thus continuously denies customary forest owners their rights and benefits from the development of their forest resources.

Industrial forestry in PNG is categorized into large-scale industry and small-scale industry. Large-scale industry involves log exports and sawmilling while small-scale industry involves portable sawmilling at the community level. Large-scale industries are mainly foreign-dominated and contribute around 9 percent of the total GDP, employing between 5-7 percent of the total formal employment. Small-scale industry, on the other hand, is mostly community-based, but records regarding their activities are not readily available. This is an important sector that the government currently does not pay much attention to.

Large forest industry companies are affiliated with PNG Forest Industries Association (PNGFIA), an incorporated association of companies in all levels of operation in the timber industry. Under the Forestry Act 1991, PNGFIA is a legally recognized body representing the interest of the industry and has a place in the PNG Forestry Board. The PNGFIA has a current membership of 45 companies and is intent on maintaining active representation of its members' concerns in view of the many public issues related to forestry industry in the country.

PNG's large industrial forestry is focused on the harvesting of the natural forest areas for round log exports. Raw logs provide most of the export volume and value, although sawn timber and veneer have become increasingly important in the last three years. Privately-owned companies control all commercial timber production from natural forest areas. The role of the State is limited to monitoring and control, and it does not play an active role in forest management.

The government continues to be the primary beneficiary of the forest industry, receiving US$ 30 million in cash revenues annually. These receipts go directly into consolidated revenue. The government pays for the PNG National Forest Service, the Department of Environment and Conservation, and independent log export monitoring. However, an examination of the budget papers suggests that government provision of infrastructure and social services to the communities in logging projects is limited.

The forestry industry plays the major role in terms of the economic activity associated with the production of wood products. Its operations are part of a value chain that includes other participants who rely upon the activities of the industry for at least part of their income, such as transport service providers and other local businesses that supply products and services to the industry and directly benefit from the activities of the industry.

There are a number of economic impacts associated with the forestry industry. These benefits accrue across the country from the lowest levels of economic activity within villages that support forestry operations, to coastal shippers that transport the forestry products to the market, and finally to the government, which receives significant taxation revenues from the sector.

The forestry industry is one of the few industries that can and does operate in remote rural areas. As such, the industry creates the few opportunities for rural communities to enter the formal workforce and access the benefits. The benefits from formal employment are also supplemented from royalties paid for access to the natural resources on their land.

Forest companies also create basic infrastructure such as roads and housing, unlike in the mining, petroleum, and agricultural industries, where no targeted tax credit system exists to encourage the provision of such infrastructure.

In the absence of government support, the presence of the forestry industry in rural areas is usually seen as a proxy for the government with communities becoming entirely dependent on the operation to act as the government body and the business entity to provide services to the community.

The concept of royalties and formal employment improving rural areas and communities' standard of living is sound. Unfortunately, a combination of local corruption within landowner organizations, poor education, and lack of government presence both in terms of meaningful development and appropriate institutional involvement do not enable the realization of the full value of this concept (Price Water House Report for FIA, 2006).

Large-scale plantation establishment

Most of the government-established plantations are in a state of neglect due to lack of funding and landowner disputes. Plantations established by timber companies, though in a healthy state, are hampered by landowner disputes and competition from other land uses. Landowner disputes are common issues because of lack of commitment in honoring land lease agreements. The lease agreements are generally for 99 years and landowners claim that the government often fails to pay annual lease payments, including those sub-leased to timber companies.

Large-scale plantations provide employment to rural people. However, there is strong evidence that most employees have been employed from outside the communities, depriving the landowners their rights and employment benefits. This is one of the major contributing factors to landowner disputes. Although large-scale forest plantations create opportunities for employment and other benefits, the landowners are often denied these opportunities, creating major social issues such as law and order and increasing poverty.

Large-scale plantation establishments in PNG are generally undertaken at state and large private sector levels. Plantation activity is currently insignificant with only 62,000 ha under production, in which 55 percent are state-owned and 45 percent are privately-owned. The common species in the private sector plantations is *Eucalyptus* spp, and in state-owned plantations, *Araucaria* spp. The species choices are mainly determined by the geographic conditions: *Araucaria* species are mainly

high-altitude dominant species while *Eucalyptus* species thrive in high and low altitudes.

The potential for plantation forestry is significant, particularly in large areas of deforested grasslands. Plantation log exports account for approximately 10 percent of industry production. There is limited plantation production and only a limited number of export-oriented processing facilities. Very few finished wood products are manufactured in PNG.

PNG's recent National Reforestation Strategies 2010 (PNGFIA 2010b) are geared more towards forest plantation development to provide homogenous and specialist wood supplies for domestic and international markets at competitive prices. The strategies also intend to help develop and apply appropriate silvicultural practices to rehabilitate and improve natural growth and yields for the next cutting cycle.

The security of customary-owned land for long-term investment is considered a major challenge for the success of these reforestation strategies. In addressing this issue, these strategies are developed in a way as to look at a number of options to secure land for plantations in consultation with the landowners and all relevant stakeholders. The participation of landowners will be a key element in ensuring the successful implementation.

However, the finance for development and management of plantations must be guaranteed under the forest revenue system. Both the private sector and the government need to invest in plantation development and the revenues raised from the harvest of natural forests should support the resource replacement plan.

Employment in forest products processing and manufacturing

The forest industry creates few opportunities for rural communities to enter the formal workforce and improving their standard of living using money earned as wages. The forestry sector directly employs about 7,000 people, with half working in logging operations and the other half employed in other activities such as veneer processing, timber processing, carpentry, supporting workshop/engineering services.

One of the major constraints identified by PNGFIA (2010a) impeding progress in achieving domestic processing in PNG is landowner demands and disruptions. Without much involvement of landowners in forestry development, industries are closing down due to landowner disputes and disruptions. Forest developers are not fully providing the basic services tied under timber permit conditions to their areas of operation causing landowner disruptions. These claims by PNGFIA imply poor implementation of regulations and monitoring systems by government agencies, in particular PNGFIA. The PNGFIA is bound by legislation to ensure that all agreements adhere to logging and forest management standards, and that these standards form part of any forest management agreement, timber permit, and license. Consequently, non-implementation of provisions has led to landowner-company disputes and disruptions in operations.

Payments for Environmental Services (PES) and carbon payments

Payment for environmental services has been a topic of discussions among NGOs in PNG, but has never been put into practice due to the lack of policy directives. There is also a lack of incentives for land and forest owners to manage their resources in exchange for compensation for the environmental services. Furthermore, in a country like PNG, which is geographically rugged and where the majority of the population live in remote areas, PES does not appear to address developmental needs, such as infrastructure development such as roads and bridges.

Recent discussions about reduced emissions from deforestation and forest degradation (REDD plus) with sustainable forest management and biodiversity conservation and carbon trading appeared to be an option where PES can be adopted. The NGOs in PNG developed a carbon payment system based on the PES principle. However, this has not been discussed in detail and it is hoped that as a country framework on REDD plus and policy initiatives progress, PES will be tackled in more detail in relation to the specific contexts of forests in the country.

Carbon payments

PNG does not have a policy on climate change and REDD plus and thus there is no policy mechanism in place for carbon payments. Through the Office of Climate Change and Compatible Development, the government is still working on its measuring, reporting and verification (MRV) system. It is believed that an effective MRV system will help to direct policy development and the carbon method of payment.

In line with the carbon payment is the PNGFIA policy framework for action that emphasizes the sharing of revenues generated from carbon trading. The forestry sector in PNG through PNGFIA initially developed the Forestry and Climate Change Policy Framework for Action in 2009. The framework emphasized the need for the incumbent government to establish a transparent and well-coordinated financial mechanism that will keep custody of the funds and appropriately disburse to recipients. The framework tries to ensure that fund beneficiaries, such as landowners, are initially identified and recognized under the existing landowner mechanisms to receive their compensation in a timely manner.

Eco-tourism

Eco-tourism is an emerging industry in PNG and it is interesting to note that under the long-term strategic plan of PNG Vision 2050, eco-tourism is one of the main revenue-generating activities, apart from forestry, agriculture, and fisheries, recognizing the depletion of mineral resources, petroleum, and gas. The National Development Bank created a Tourism Credit Facility that made available about US$ two million to assist local tourist guesthouse operators.

Although the overall economic benefit from eco-tourism is not as high as mass tourism, local communities get a greater proportion of the money spent by eco-tourists compared with resort tourists. PNG could be marketed worldwide as an eco-tourism destination offering the best eco-tourism experiences in the world such as village trekking, bird watching, and encounters with traditional cultures, attracting "high-yield[5]" eco-tourists. PNG is a frontier country with a less-developed tourism industry (Hayes 2011), and eco-tourism has great potential in poverty alleviation in the rural areas.

The case studies

The two case study sites in the Central Province in the Southern Region were chosen because both involved national and community interest projects and were easily accessible by road. The third case study site was chosen due to an opportunity to visit Chimbu Province in the Highlands Region. It is a community forestry project through people initiatives, and provides another scenario of forestry contribution to poverty alleviation in the highland region of the country.

Case study 1: Varagadi FMA (Timber Permit-3-37)

Varagadi FMA area constitutes two different forest plantations with the Brown River plantation covering an area of 6,500 ha and Kuriva plantation covering an area of 8,782 ha. Both sites were originally natural forest areas but were converted into large State-owned forest plantation estates. Access to the natural forests is difficult and the traditional landowners walk some distance further inland to reach the forest areas. Most villages moved out of the natural forest areas to live along the main Hiritano Highway to Gulf Province. These movements were viewed as part of the "social advancement" of communities as a result of forest development.

The lands were customary-owned, but leased to the State under a 99-year lease agreement. The Brown River land, however, was transferred back to the original landowners following a successful Court case in 1994 by the customary landowners. The customary landowners argued that the land was never under a proper lease agreement at the time of the colonial administration and that annual rents were

[5] Cultural tourists interested in "primitive cultures".

not paid regularly. Only the timber rights remained with the State through PNGFIA. Kuriva customary landowners also expressed similar sentiments on the lack of rental payments by the State. The State lease agreements with customary landowners are generally done through the Lands Departments, which is then responsible for the rental payments.

Nature of the project

The Brown River and Kuriva Plantations are about 20 km apart and located approximately 20 and 40 km away, respectively, from Port Moresby, the country's capital city. The project falls under both old and new policy measures as the plantations were established under the old policy measures while the harvesting and marketing are under the new policy measures of FMA.

Gae Y. Gowae

The company built this school building at Brown River teak project area

In this project, PNGFIA represented the State of PNG and entered into an Agreement with a developer to undertake project development and management activities. The developer was granted Timber Permit-3-37 for 35 years commencing on 29th May 1997 and expiring on 28th May 2032. After that, the developer was replaced by a new one, though still using the same TP (3-37). Current operations are at the Brown River Plantation, but the developer has moved some equipment to the Kuriva Plantation to start harvesting the trees. Technically, these are two different resources and environmental conditions, therefore, the terms and conditions should vary. The developer should not be moving to Kuriva and operate under the same permit conditions for the other plantation.

The terms and conditions of the TP are incorporated in the Agreement. Through the TP, the State (through PNGFIA) granted the exclusive rights and obligations of the developer to develop and manage the Brown River Plantation in accordance with sound forestry principles, good forestry practices, and the principle of sustainable yield. Subject to these principles, the developer is required to develop and manage the forest resource in accordance with set schedules for harvesting, replanting, and processing of timber.

Under the TP Agreement, the developer was to establish an average of 170 ha of teak plantation forest

annually and harvest and process an average of 45,000 m^3 annually. The financial benefits of the project under the Permit Agreement include the following payments to PNGFIA:

- Timber royalty at US$ 12.50 per m^3 of logs
- A 10 percent premium from the sale of forest produce from the area, minus the royalty, if any;
- An advance on the premium of US$ 36,000 upon the execution of the TP;
- Levies of 3 percent on the price received by the Developer for the sale of forest produce from the first crop on that portion of the area known as the Varagadi FMA, and 1.5 percent on the price for the sale of other crops from the area.

In addition, the developer must establish a Plantation Development Fund with a reputable bank in the country with an amount of US$ 77,500 to be utilized by the developer solely to pay for growing costs.

Under this Agreement, the State (through PNGFIA) pays 95 percent of the timber royalties to the traditional landowners, retaining 5 percent as withheld tax. This 95 percent is from the 10 percent of the market price of US$ 12.50 per m^3. The developer also undertakes certain operational agreements to develop and manage the forests, comply with Codes of Directions and the Act, and undertake downstream processing for locally-processed timber.

Community benefits and contribution to poverty alleviation

There are two ILGs involved in this project: the Edevu ILG, representing the Mekeo people; and the Hohora, representing the Koiari people. There were no specific forms of benefits for the communities affected by the project. The only direct form of benefit is payment of timber royalties.

A sample of timber royalty payments showed that a total of US$ 683,317 was paid to the two groups between 2007 and 2010, in which US$ 406,960 and US$ 278,357 were respectively paid. Estimated amounts of US$ 100,000 and US$ 70,000 were collected annually, respectively.

The other form of direct monetary benefit to communities is through employment. However, during the interview with community representatives, a youth leader categorically denied any form of employment by the developer. A spin-off benefit is the sale of garden produce at the village market sheds along the road to plantation workers, who are generally outsiders. Otherwise there are no other evident spin-off business activities that use royalty monies to trigger other small-scale development activities. There are a few semi-permanent houses built in the villages, indicating the use of the money received from the timber royalties.

The project agreement does not cover community services like education, health, and infrastructure development. Plantation ownership rests with the State, who is then tasked to provide such services for the landowners.

The impact of the project on poverty alleviation in the communities was obvious, but not as effective as expected, both due to the landowners' own poor financial management and the State's inefficiency in its responsibilities to ensure compliance with timber permit conditions. Although there is no evidence of poverty in the communities affected by the project, there is also no strong evidence of improved living standards, in contrast to those communities outside the project area. Given the amount of money received as timber royalties, the expectation is improved living standards of the communities affected, compared with those outside the project area.

The State (through PNGFIA) also failed to ensure effective compliance of certain conditions of the project by the contractor. Employment opportunities for the youth in the communities should be enforced. Also, small spin-off businesses including community subcontracting in nursery and plantation work should be given to community groups.

Case study 2: North Vanapa TRP (Timber Permit-3-32)

North Vanapa TRP covers a total area of 78,422 ha of natural forests with a total estimated standing timber volume of 300,000 m^3 and comes under the old policy measures of resource acquisition and management. The TRP system was replaced with the FMA following the enactment of the 1991 Forestry Act, and amended in 1992. However, TPs issued under the TRP system prior to the 1991 Forestry Act remain valid until the expiry date. Following the expiry date, the new permit would be issued under the FMA system. Two major tribes, the Koiari and the Doura in the Kairuku District of Central Province, live in the project area and comprise the three clans from five villages.

Gae Y. Gowae

Since the logging project started in the 1980s, logging operations were fraught with problems involving the private contractors that were changed four times. As abandoned logging equipment and logs are left to waste, landowners lose out on the benefits.

Nature of the project

North Vanapa TRP area was acquired in 1982 for a period of 30 years (1982-2011). However, the actual development of the resource took place eight years after, in 1990, when the timber permit (TP-3-32) was issued to the Landowner Company. Under this management arrangement, the Landowner Company was formed and issued the TP as permit holder. The company then entered into a logging and marketing agreement (LMA) with a contractor (foreign company) to undertake all the development activities, including marketing and the TP conditions. The Landowner Company monitors the compliance of LMA conditions by the contractor, while PNGFIA monitors the compliance of TP conditions. The Landowner Company officials are ILG representatives. The project has both national and community interests operating under industrial and corporate entities with the objectives of meeting the national interest and goals of social-economic growth while bringing in vital social services and infrastructure development into the affected community areas.

Under the project agreement and the terms and conditions of the TP, the permit holder (through the developer/contractor) was required to harvest an average rate of 70,000 m^3 of timber annually, export an average of 50,000 m^3 of logs annually, and process about 20,000 m^3 of logs in average annually. Based on these average production targets, the permit holder, within seven days from each log shipment, was required to pay an amount of US$ 0.40 per m^3 of logs harvested to the then Department of Forests (now PNGFIA) as reforestation levy. Similarly, the permit holder was required to pay an amount of US$ 0.80 per m^3 of logs exported into an Agricultural Trust Fund, which should be managed by the permit holder for agriculture Projects in the permit area.

Also, the permit holder was required to construct, upgrade, and maintain all roads and bridges the project requires for the life of the project. The permit holder was required to construct at least 10 km of road per year within the project area to facilitate its operations.

The project generally improved the living standards of the communities affected, though not all permit conditions were met satisfactorily. There are evident infrastructure developments, such as the school administration building. During the meeting with the landowners, some of their leaders expressed dissatisfaction over the performance of the landowner company officials. They cited the lack of annual general meetings, financial reports, and implementation of community benefits.

Community benefits and contribution to poverty alleviation

The main direct benefit to the communities affected by the project is timber royalties. Timber royalties were paid at a rate of US$ 4 per m^3 of the logs harvested. A sample of timber royalty payments between 2007 and 2010 showed a total amount of US$ 173,836 paid, at an average of US$ 43,459 annually.

There were no breakdowns of the amounts paid to each clan shown in the reports. However, it can be deduced from this sample payment of timber royalties that forest owners were paid substantial amounts of money for timber royalties, by rural community standards, and had an impact on the living standards. But the question of sustainability remains, as there is limited financial management capacity within the communities, clans, families, and individuals.

The other indirect benefits to communities include project levies and infrastructure development. The project levies are the reforestation and agriculture levies. The reforestation levy was paid at a rate of US$ 0.40 per m^3 of logs harvested, estimated to be about US$ 15,600 paid in total over the same period. The agriculture levy was charged at US$ 0.80 per m^3 of logs exported, but there were no available corresponding log export volumes to estimate the total amount paid. These levies are paid into trust accounts controlled by the State, through PNGFIA, and the Provincial Government. Forest owners are eligible to apply for the use of such funds.

Infrastructure development includes construction and upgrading of the community hall, church, communication facility, sporting facility, water reticulation system, classrooms and teachers' houses, health center and health workers' houses, and a generator to provide electricity. Not all these infrastructure development requirements were met satisfactorily.

The government built the classrooms and the teacher's house financed by the infrastructure levies collected. Forestry projects in PNG's rural areas focus government attention on the communities affected because of the revenues generated through forestry levies for the government through provinces. Government development budgets then should prioritize the service provisions for these communities affected by forestry projects.

Income generation and infrastructure development taking place in the project area strongly suggest levels of poverty alleviation as a result of the project. Without the project, there are no other options for major development and income generation. The only income option is selling garden produce to travelers at nearby markets along the main highway or at the main markets in the city. Infrastructure development is below expectations as per the TP conditions.

Case study 3: Oneketo community forestry

Oneketo Community Forestry is a community initiative project to afforest grassland areas. The project is located at the border of Eastern Highlands and Simbu Provinces, between Watabung and Chuave. The project covers an area of 2,700 ha planted with 1,000 trees. The project was initiated by the community of Oneketo upon realizing that there is already scarcity of wood for firewood, fencing, and building.

Nature of the project

The area is classified as non-forested, with a very low stocking rate and other vegetation types on dry land. With the increasing population and the increased demand for wood, the community decided to undertake planting of trees on the grassland areas. An NGO, Partners with Melanesia (PwM), provided technical assistance in nursery training and nursery establishment. The community set up a proper

Gae Y. Gowae

A nursery bed is established for seedling production to reforest logged-over mountainsides and ensure future sources of wood for cooking, constructing houses and other purposes.

nursery site, including a shed for tools and a small office, where records of seedling production, tools used, and areas of planting are kept. A visit to the project site was made possible through PwM during an official launching of a community forest conservation program in Chimbu Province.

Project benefits and contribution to poverty alleviation

There is great demand for wood in the highlands region where there are large grassland areas. Planting of trees in these grassland areas is now becoming an important individual, family and community activity in the region. A number of local NGO groups and community-based organizations in the region realize the need to afforest the large grassland areas. Community representatives said they are doing this for the benefit of their children and future generations and claimed that these large grassland areas cannot remain idle as demand for wood increases with increasing population.

The other benefit of tree planting activities in the highlands region is soil protection. The community realized that with the increasing population, the scarce forests were cleared without replanting, resulting in high occurrences of landslides and soil erosion. Communities are encouraged to plant trees for purposes of both reforestation and afforestation.

Community forestry in the case of Oneketo is for local wood consumption and environmental protection. Since wood is becoming scarce in the area and there is soil erosion and environmental degradation of the large grassland areas, the people of Oneketo showed great interest in undertaking such activities at their own initiative. People in this area are used to agricultural practices, specifically, growing coffee. The afforestation of grassland areas will provide additional income through sale of local timber.

There is already widespread interest in the area and the region for afforestation. The National Forest Service in the region is undertaking a major afforestation program and is supplying seedlings to the interested communities. NFS plans to supply 300,000 seedlings throughout the region annually to support the program. Communities are very much interested in afforesting grassland areas and this activity is raising the profile of communities in the region.

Case study analysis

The case studies presented two different scenarios: forestry projects initiated for both national and community development interests and a community-initiated project for subsistence. The main concern identified in the national-initiated projects is that the terms and conditions of the timber permits were not fully met, depriving the landowners their rights and maximum benefits from the development of the resources. The other concern is that timber royalties were not properly managed

and no follow-up was done to sustain the income-generation activities. The ability of customary owners to manage and re-invest money earned from forestry into other spin-off activities to sustain their incomes is of great concern.

The third case study demonstrates an increasing trend of community forestry in the highlands regions. There are already concerns of scarcity of wood and timber in rural areas as a result of increasing population. Rural villages are now planting trees in small patches of land to supplement already depleted limited forest resources, a new trend in family and individual forestry in the country. The harvested timber is sold locally as there is great demand. Also, planting of trees prevents soil erosion and supports subsistence farming. The PNGFIA highlands regional and provincial offices are working with local community authorities to assist and in this regard, community forestry has a huge potential for poverty alleviation in the highlands region.

Outlook of forestry contribution to poverty alleviation

The forestry sector has great potential for contributing to poverty alleviation in rural areas. However, there are strong indications that not all the concerns raised in the Barnett Inquiry that led to the development of new legislation were resolved. Timber permit conditions were not fully complied with and implemented. Various levies collected from the sector were not used to support and sustain follow-up developments and to create sources of incomes in rural areas. The same goes with timber royalties collected by forest owners.

Policy initiatives

Government policy initiatives towards poverty reduction in the rural areas will only be realized if the forestry sector develops specific focus and strategies on rural poverty reduction. Forestry sector goals for rural development are broad and depend on the compliance with timber permit conditions by developers. While there are sound policy initiatives and frameworks for rural development, effective implementation is lacking.

To achieve the government's national strategies for poverty reduction in rural areas, the forestry sector and public and private sectors need to develop their own specific strategies to translate these national strategies (PNGDSP 2010-2030 and MTDP 2011-2015) into specific sector actions targeting rural poverty reduction with specific budget inputs, expected measurable outputs, with performance indicators and means of verification. Only then can forestry's contribution to poverty alleviation be effectively and fully realized. At this point, the national strategies for poverty alleviation in the forestry sector are just statements, and can only be implemented through specific forestry sector actions.

Forest resource management

Poverty alleviation in the rural areas is a long-term objective that can be achieved if appropriate short-term and medium-term plans and strategies are put in place. Most of the forest resources (67 percent) with potential commercial values are acquired and controlled by the government through PNGFIA. Around 33 percent of the forests identified as commercial forest areas remain intact, including the 13 percent acquired by government but have yet to be issued timber permits. An overview of PNG's timber resources (PNGFA 2010a) indicates that most provinces have almost depleted their resources while others have overcut their available timber resources. The highlands provinces have little natural forest remaining and due to population pressure, the resources will be harvested mainly for local use and fuelwood. Sustainable forest management needs to be effectively practiced and must be pursued beyond statements.

Forest resource management also includes management of other forest types on which the rural population depends for their livelihoods. Currently, the emphasis is only on commercial forests. There are other forest types that do not only provide food sources for subsistence living but also other products that can generate income. For example, mangrove forests supply durable construction

materials and also habitats for mud crabs, important sources of protein for local consumption and can be harvested and sold.

Managing forest resources effectively can lead to achieving the long-term goal of poverty reduction in rural areas. Effective management of forest resources requires stakeholder involvement, including forest resource owners. The PNGFIA, under its new development guidelines, recognizes the importance of community forestry in its reforestation program and re-emphasizes the involvement of landowners and resource owners, but implementation is poor. Effective resource management (plantation inclusive) on a sustainable basis should be the basis of the forestry sector's contribution to poverty alleviation in the rural areas.

Recommendations

The forestry sector has great potential for improving living standards and reducing poverty. However, the government has to create an enabling environment to make this happen. This will require policy reviews targeting the interests and welfare of forest owners and communities affected, not just the national interest. The government will have to expand its focus on the overall objective of forestry development in the country of securing national interest to incorporate the more specific interests of forest resource owners. The PNGFIA should be given financial autonomy over the revenues generated to improve and increase their functions to support forestry activities at the forest owners' level.

Rural communities and forest owners will have to change their attitudes and mindsets to ensure improvements in their living standards. The management of incomes generated from forestry activities should include the reinvestment in small-scale business spin-offs following logging. Forests should be managed for collective benefits and not just for timber. Cultural values of leadership and wealth distribution among clan members need to be sustained.

The following recommendations are possible ways forward for forestry contribution to poverty alleviation in PNG's rural areas:

Review the concept of national interest in natural resources development

There is a need for a major policy shift in the forestry sector towards poverty alleviation in rural areas. The primary focus in the forestry sector is in securing the national interest through revenue generation for national budget purposes, while resource owners and rural communities are of secondary interest. Funds intended to assist resource owners and rural communities do not reach them as what must be ensured first are government budget targets financed from the forestry sector.

The GoPNG through PNGFIA needs to shift its focus from general forest development projects to more specific poverty alleviation projects. The notion of national interest needs to be critically looked at because national interest must also include the interests of communities affected by each forestry project. The national interest concept is based on the fact that not all provinces in the country have an equal amount of resources to generate necessary revenues to meet the social-economic obligations and services of all people. However, this study indicated that provinces with small forest areas are better off in terms of social indicators than those provinces with large forest areas.

Forestry sector's poverty alleviation strategy

It is imperative that all natural resource sectors should have their own strategies for poverty alleviation in rural areas. Poverty alleviation strategies should be integral components of planning and prerequisites to government approval of natural resource development in the country. It should not just be a follow-up activity by the social sectors. In fact, the poverty situation of an area where there are natural resources like gold, copper, and timber, is always used as the basis to get government and resource owners' approvals for the resource to be developed.

Forestry being a renewable resource sector should have a strategy for poverty alleviation in rural areas. The strategic direction for the PNG Vision 2050 is to develop its renewable resources, including forestry, to enable its economic growth by 2050. It must be broad-based, ensuring that household incomes will be much higher and improve the overall HDI. The PNGFIA's policy envisions financial autonomy that can be attained through integrating the vision's strategic direction with poverty alleviation.

The various levies collected from forestry projects should be incorporated into this strategy to give more impetus to the forestry sector contribution to poverty alleviation in rural areas. It seems that huge amounts of money accumulated through trust accounts of these levies were not effectively used to address the plight of forest owners and rural communities, and were instead diverted.

Review of financial benefits by forest owners from forest resource development

Forest resources in PNG are customary-owned, but customary owners get a mere 3 to 5 percent of the total monetary value of the resources through timber royalties while the State gets up to 10 percent of the total value, and the remainder portion goes to the developer. The arguments are that resource owners get more benefits beside timber royalties in terms of infrastructure developments and other services brought into their area by the project. But in reality, infrastructure developments and other services rendered through the project are part of the government's responsibilities, and thus accrue to the government's total benefits and not necessarily a direct share of the forest owners.

If the government is serious about its poverty reduction strategy as incorporated in its Vision 2050, then one effective strategy is to increase the forest owners' share of financial benefits from the forestry project development to improve household incomes. Timber royalty currently averages US$ 4 per m^3, a slow increase from the rate 30 years ago of US$ 1.40. The basis for calculating timber royalties should be reviewed regularly, taking into account the real market values of timber and other opportunity costs.

The various levies and the methods of payments need immediate review. These levies should be paid directly to forest owners, particularly the agriculture and reforestation levies. Additional levies should be charged on the use of forests and foregone opportunities as a result of logging. Levies that are used for infrastructure development and social facilities like education and health need critical review. Developers easily avoid their agreed commitments by paying these levies to the government, which then finds excuses not to utilize the levies due to lack of capacity. Forest owners, meanwhile, lack the capability to access these funds, resulting in huge amounts of funds sitting in trust accounts and squandered elsewhere. Infrastructure and social levies should be paid directly to the appropriate agencies with stringent conditions to undertake the activities with measurable outputs and indicators within the timeframe.

Improving the financial management capability of forest owners

Forest owners and landowner company officials should be given basic financial management and accountability procedures to manage the funds received from timber royalties and timber premiums for landowner companies. Forest owners and company officials should be educated on the purposes of the different levies collected and the methods to access these funds, including writing proposals to access these funds. This will require strong institutional linkages between PNGFIA and other appropriate agencies, including the district offices, local level governments, and ward councilors.

Poverty alleviation will have to come from an internal commitment by individuals, families and the communities at large, and it has to start with money management. Forest owners have to be given opportunities to understand the value of money.

Revival of PNGFIA's extension services and financial autonomy

There is an urgent need for PNGFIA to revive its extension services abandoned years ago as part of past policy reforms in the sector. Senior forestry officers within PNGFIA who were once involved in the

extension services works expressed their strong desires that this program be revived as this can provide more assistance to forest owners.

To give impetus to forestry extension services in the country, there is also a need to give PNGFIA financial autonomy status. Financial autonomy for PNGFA has been an agenda but has never progressed beyond discussion. The scope of work in the public forestry sector is enormous given the geographical factors of the country and the current annual operational budgets for PNGFIA are insufficient for additional activities. Therefore it is important that PNGFIA be given financial autonomy so that revenues generated from forest resources are put back into good use to assist forest owners and rural communities.

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