3 Section

Economic issues

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Unlocking the Value of Pine Forests for Sustainable Livelihoods: A Case Study from Hile Jaljale "Ka" Community Forest in Kabhre Palanchok District of Nepal

Padam B. Chand
School of Natural Science
Kathmandu University
Nepal

Kalpana Ghimire
Resource Identification and Management Society
Nepal

Introduction

Community-based natural resources management has become an important strategy in Nepal since the Government of Nepal (GoN) originally introduced the concept of community forestry (CF). Under this system, the government hands over areas of national forests to local communities known as community forest user groups[1](CFUGs), who take over the responsibility for forest protection, management, and utilization of the area allocated as community forest. Community Forestry in Nepal is an institutional innovation for empowering local communities in managing forest resources for their own benefit. So far, 1.187 million ha of community forest have been handed over to the 14,260 community forest user groups, benefiting 1.64 million households (Department of Forest 2006).

Although CF has been widely acknowledged as a success, various challenges have emerged over time. Community Forestry is now facing second-generation issues, related to sustainable forest management, livelihood development, and governance (MFSC 2004). These issues could be addressed through provisions made in the community forest Operational Plan[2] (OP), which would allow poor households to be reached through pro-poor program approaches.

Despite the successes of the community forestry program in the conservation and improvement of forest resources, past reviews show that the forest management approach adopted has largely been protection-oriented and has remained passive in terms of utilization of forest resources. Most community forests have, thus far, been managed for protection and basic needs and not for surplus production or poverty alleviation (Shrestha 2001).

Pine plantations are a potentially valuable asset for the communities that have invested in plantation establishment and protection for over two and half decades. Most of the plantations are overstocked and in need of active management. Communities are currently gaining only a fraction of the benefits that could flow from these forests. The costs of not actively managing the community forests are substantial. According to Hill (1999), the World Bank has estimated the cost to the country of not having active forest management and silvicultural operations to be Nepalese Rupees (NRs.) 560 per household per year (approximately US$ 7.50[3]).

The management of these plantations thus far has been very basic: little silviculture or harvesting has been undertaken. A study done by Hunt *et al*. (2001) shows that there is an inverse relationship between stocking density and growth, i.e., as stocking increases, growth decreases. Delaying thinning results is a significant loss in opportunity costs, between NRs.15,000 and 20,000 (US$ 203–270) per ha every year. Kanel (2004) suggests that there is also a substantial potential for further generating income from the better management of community forests, and the funds generated can be better utilized to benefit the poor and marginalized groups.

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1 CFUG is an autonomous and corporate body with perpetual succession for the conservation, management and utilization of the community forest.

2 The operational plan (OP) is a community forest management scheme developed and agreed by the CFUG and approved by the District Forest Officer. It is a legal document which empowers CFUG to manage, conserve and utilize the allocated community forest.

3 Based on conversion rate of NRs 74 to US$ 1.

Pine plantation management and issues

According to Acharya (2001), active forest management in community forestry involves four essential factors. They are: (i) existence of supportive policy and legal environment; (ii) clear forest management objectives of the users; (iii) the capacity of CFUGs and District Forest Office (DFO) staff; and (iv) the condition of forest resources.

In this regard, initiatives have already begun in Kabhre Palanchok and Sindhupalchok districts for the active management of the pine plantation forests. Through an integrated approach, all the factors mentioned above are present: an empowering legal environment through the pro-community Forest Act and subsidiary regulations and guidelines; thinning guidelines for technical management prescriptions that match with the people's interest; revision of OPs by CFUGs incorporating thinning prescriptions; approval of these OPs by the DFOs; and the availability of pine plantation forests as a potential resource. However, due to lack of established tradition of plantation forest management in Nepal, the following broad issues still prevail and hamper the scaling up process:

- More than 450 CFUGs with pine plantations in Kabhre Palanchok and Sindhupalchok are protection oriented and need substantial technical and marketing guidance for management of their forest assets if the CFUGs are to realize the potential poverty alleviation benefits from these plantations;
- There is a serious lack of knowledge about forest plantation silviculture, harvesting, and sawn timber marketing;
- There is an overall lack of scientific management that leads to potential benefits not being realized and, in many cases the deterioration of plantations;
- Government forestry staff do not have adequate outreach into the communities, nor appropriate working guidelines or training or incentives; and
- The plantations are overstocked due to a lack of thinning, which leads to them not producing high-value saw logs as rapidly as they should.

In Kabhre Palanchok and Sindhupalchok districts, early plantations were established during the 1970s, but the bulk of the planting was undertaken during the 1980s, with the majority of existing plantations between 14 and 27 years old. Three pine species are used in these plantations: *Pinus roxburghii, P. patula, and P. wallichiana*. Of these, *P. patula* is an exotic species (Gautam and Webb 2001). Initially, pine was favored for plantation development as it is less vulnerable than other species to damage by grazing animals and can grow in degraded areas with poor soils.

According to DFO records, there are more than 22,000 ha of pine plantations in Kabhre Palanchok and Sindhupalchok districts. However, initial assessment of these plantations done by the Nepal-Australia Community Resource Management and Livelihood Project (NACRMLP) show that there are effectively 15,500 ha of pine plantation in these two districts (see Table 1). Out of these, 75% are community forest, with the rest located in government forests. There are also some mixed forests with pine trees. Thus, about 20,000 ha of forest are stocked with pine trees in these two districts.

Table 1: Initial assessment of pine plantations in Sindhupalchok and Kabhre Palanchok Districts

SN	Description	Area in both districts (ha)
a	Pine plantations in community forest	10,138
b	Pine plantations in government forest	3,429
c	Total pine plantations (a+b)	13,567
d	Mixed pine and broadleaf forest	6,131
e	Effective area of pine forest resources within the mixed forest	1,933
f	Total effective pine plantation forest (c+e)	15,500
g	Total area of forest with pine trees (c+d)	19,698

Source: Pine Profile of Kabhre Palanchok and Sindhupalchok districts, 2005

Potential productivity and revenue generating capacity of pine plantations

Assuming an 8 m^3 per hectare per year mean annual increment (MAI), total potential annual log volume production of these pine forests is approximately 124,000 m^3 per year, and the potential annual average harvest of sawn logs during the second half of rotation is 248,000 m^3 per year. Assuming a sawmill gate value of NRs 4,590 per m^3 (US$ 62 per m^3), the estimated average annual sawmill gate sales value of sawn log production over the next two decades is NRs.1.15 million (US$ 15.5 million). Thus, according to these calculations, the potential annual income from pine plantation management for just two districts is nearly double the total allocated development budget of NRs. 640 million (US$ 8.6 million) for the entire forestry sector in the country for the current fiscal year (GoN 2006).

This scenario indicates that the potential sales value of plantation produce through thinning is substantial, working out to more than NRs. 25,000 (US$ 340) per household per year. These numbers show that the commercial approach to pine plantation utilization and management, especially for the direct benefit of poor people and for rural development activities, has a significant yet largely untapped potential.

Thinning guidelines: a scientific basis for pine plantation management

As CF now embraces a new paradigm, focusing on forest management rather than protection, new challenges are emerging. More than 450 community forests in these two districts, particularly those with successful pine plantations, are overstocked and in need of technical forestry intervention in scientific forest management. Therefore, thinning[4] guidelines were developed for implementation by the CFUGs. Orientation was given to CFUGs, DFO staff, local facilitators, and other stakeholders about how to incorporate thinning prescriptions in the revised OPs. They were also given training to apply thinning regimes in the field during forest management training.

4 Thinning is a forest management practice generally performed at various points in time during the course of the growth and development of both natural and planted stands. It is defined as "a felling made in an immature stand for the purpose of improving the growth and form of the trees that remain without permanently breaking the canopy."

These thinning guidelines are based on decades of international research as brought together by Evans and Turnbull (2004), local research in Sindhupalchok and Kabhre Palanchok districts undertaken during the last two phases of Australian assistance to the forestry sector in Nepal (Hunt *et al*. 2001), and special studies conducted by NACRMLP (2006) for the purpose of these guidelines.

The guidelines have been endorsed by the Ministry of Forest and Soil Conservation and are being piloted in 20 CFUGs of Sindhupalchok and Kabhre Palanchok districts. For the national-level implementation of these guidelines, the Department of Forest Research and Survey has done field testing with CFUGs and recommended draft guidelines to the MFSC for approval. These guidelines form the basis for prescribing thinning regimes in the OPs by CFUGs during preparation or revision of their plans.

Thinning prescriptions

The thinning prescriptions follow prescribed stocking levels for each stand of a particular species, age, and growth rate. The number of trees to be thinned per hectare at each thinning is stipulated. The prescriptions are remedial in nature, so they are limited in application to the currently overstocked pine plantations as found in the districts.

Age classes

The thinning prescriptions are based on two age categories for both *P. patula* and *P. roxburghii*: 15 to 19 years and 20 to 25 years. The final rotation for *P. patula* is prescribed as 45 years, though it may be as young as 40 years for faster growing stands and as old as 50 years for slower growing stands. For *P. roxburghii* the rotation age is taken as 55 years, though again, there may be a margin of five years either way depending on the quality of the stand and the growth rate.

Stocking

As the initial spacing at planting was 2.5 x 2.5m, or 1,600 plants per ha, three existing stocking scenarios have been chosen for the guidelines, assuming varying degrees of thinning and/or mortality:

- 1,300 to 1,500 stems per ha (no thinning);
- 1,100 to 1,300 stems per ha (higher mortality or maybe one thinning); and
- 800 to 1,100 stems per ha (some thinning and/or heavy mortality).

The final stocking varies from 160 to 240 trees per ha. The low thinning system of selective thinning will be applied where dead, dying, diseased, poorly formed, and suppressed trees will be removed in such a manner as to leave evenly distributed, well-formed vigorous trees that will develop into the final crop with consideration for root and crown competition.

Case study: Hile Jaljale “Ka” community forest gearing towards active pine plantation management

Hile Jaljale “Ka” community forest is located in Tukucha VDC of Kabhre Palanchok district (35 km northeast from Kathmandu, the capital of Nepal). This forest is connected with a fair-weather road linking to Banepa, a nearby town, and Kathmandu City. The total forest area is 118.14 ha, which is divided into seven blocks, 27 sub-blocks and seven

working circles. The forest contains highly valuable pine plantations of *Pinus patula* and *Pinus wallichiana* species. Sale of pine logs has been identified as the highest priority business opportunity for the CFUG.

This CFUG comprises 242 households with a total population of 1,494 persons, and is relatively homogenous in terms of ethnicity, with 90% belonging to the Brahmin caste (an upper caste group under the Hindu system). The remaining 10% are from occupational castes and ethnic minorities like Kami, Damai, Newar, and Bhujel. The CFUG Executive Committee (EC) was recently reformed and is composed of 11 members including four women and one occupational caste representative.

Agriculture and livestock are the main sources of livelihood for most households. Good road access to the cities of Bhaktapur and Kathmandu allows farmers to profit from growing high-value cash crops such as potato, cauliflower, cabbage, beans, and broad-leaved mustard. Potatoes are the predominant commercial cash crop, whereas paddy, maize, wheat, and finger millet are the major food crops. The sale of milk is also a major source of income for most households.

The forest is well protected and some thinning operations were conducted in the past. So far, CFUG has harvested 2,771 pine trees (total volume 596 m^3 or 21,088 ft^3) and earned more than NRs. 1.72 million (approximately US$ 24,000), which they have invested in physical infrastructure development, including the construction of forest roads, school buildings, drinking water supply systems, and other community development facilities. The income of the CFUG has increased gradually over the last four years.

Income and employment generation opportunities

During the revision of the OP, timber inventories were conducted within each forested sub-block to assess forest condition, determine the need for silvicultural treatment, predict potential yields and regulate actual harvests. Almost all the pine plantations are overstocked from the perspective of commercial production of saw logs and development of under-canopy forage and fodder supplies. These plantations will now be managed for commercial saw log production, with grass and fodder production where possible, as well as for the exploitation of the existing pine crop for saw logs and gradual conversion to broadleaf forest. Provisions were made to manage overstocked pine plantations by applying thinning regimes according to thinning guidelines. This activity will be the major source of funding for the CFUG investment plan.

According to the business plan of Hile Jaljale "Ka" community forest, the CFUG can harvest more than 2,461 m^3 (87,000 ft^3) of timber, from which more than NRs. 14 million (approximately US$ 200,000) can be earned from the sale of pine logs over a five-year period (see Table 2). The CFUG's annual average income currently ranges from NRs.1.5 million to 3.9 million (US$ 20,000 to 52,702). This shows that the CFUG will earn eight times more than they earned during the last four years (NRs. 1.73 million or US$ 233,783). Likewise, the total yearly income of the CFUG is three to eight times higher than the total budget of the Village Development Committee (VDC).[5] This is a substantial income for a CFUG, as there are 15 CFUGs in the Tukucha VDC and Hile Jaljale "Ka" community forest is just one of them.

[5] *VDC is an autonomous and corporate body at the local level, which executes development and administrative activities with NRs. 500,000 per year budget allocated by the government.*

Similarly, the planned forest operations will result in significant labor market development, which will be of particular benefit to the underemployed. More than 17,800 person-days of employment will be generated, with a total income value of NRs. 3 million (US$ 40,563). Average annual employment generation is more than 3,500 person-days, with an annual average value of employment generation of NRs. 600,000 (US$ 8,108, see Table 2). The value of employment generation is in addition to the total income from the sale of pine logs.

Table 2: Anticipated income, expenditure, value of employment (NRs.) and employment generation (in person days)

Year	Income from log sales to external markets	Expenditure for marking, harvesting, transportation	Expenditure for other program activities	Total expenditure	Annual balance	Labour market creation (person days)	Value of employ-ment
2006/07	1,518,000	668,000	819,000	1,487,000	31,000	2,379	360,917
2006/08	2,675,000	1,109,000	1,535,000	2,644,000	31,000	3,781	601,377
2006/09	4,333,000	1,697,000	1,776,000	3,473,000	860,000	5,512	916,650
2006/10	1,668,000	645,000	1,020,000	1,665,000	3,000	2,007	354,680
2006/11	3,953,000	1,416,000	1,275,000	2,691,000	1,262,000	4,186	768,091
Total	**14,147,000**	**5,535,000**	**6,425,000**	**11,960,000**	**2,187,000**	**17,865**	**3,001,717**
Total in US$ equiv.	191,176	74,797	86,824	161,621	29,554		40,563

Source: Operational Plan of Hile Jaljale "Ka" Community Forest (2006)

The thinning operations will mostly be undertaken during the agricultural off-season and the associated cash income can guarantee year-round food security for all. Local poor and excluded represent the work force for the harvesting and transportation of the trees in the community forest. This shows that there is substantial potential from active pine plantation management to generate financial capital that can be reinvested for the improvement of local livelihoods, especially for the poor and disadvantaged groups. Moreover, it is projected that there will be a substantial net balance of more than NRs. 2 million (US$ 27,000 – see Table 2) after only five years.

Investment plan Hile Jaljale "Ka" community forest

The CFUG has recently revised its OP for a five-year period incorporating thinning prescriptions for the sustainable management of the forest resources. The CFUG has prepared a comprehensive plan with active participation from the community. The plan gives a clear indication of how the CFUG can generate financial capital from its natural capital, and how it can be reinvested for the livelihood improvement of the CFUG members.

The CFUG will first focus on forest thinning to generate income. Receipts from the sale of pine logs removed during silvicultural thinning will finance all program activities. Box 1 gives an overview of the major planned activities for a five-year period (2007 to 2011).

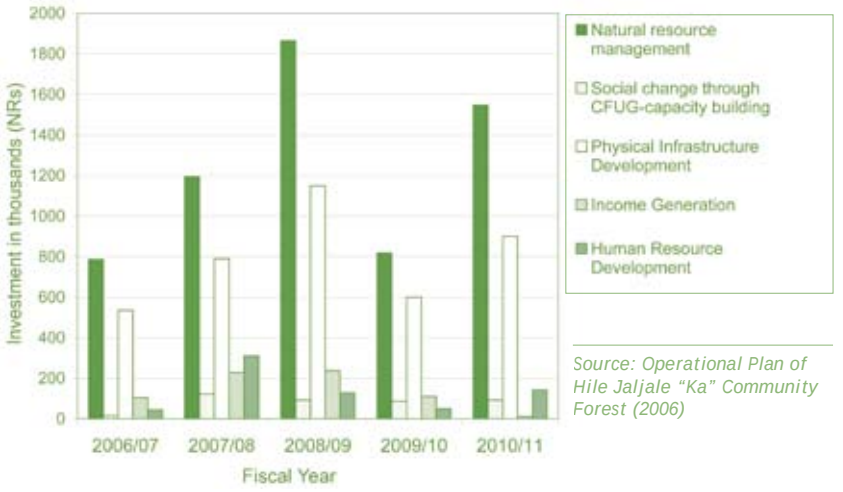
Box 1: Program activities of Hile Jaljale "Ka" CFUG	
Natural resource management	• Pine plantation thinning • Harvesting of mixed forest • Pruning and shrub land management • Nursery establishment and seedling production • Plantation in community and private land • NTFP management (*Taxus baccata, Acorus calamus lichens*, *Lycopodium* species, and *Daphne* species) • Pear grafting to *Pyrus* species • Forage and fodder development • Broom grass planting along roadsides • Pine plantation management demonstration plot establishment etc.
Social change through CFUG capacity building	• Inclusion of women, landless and disadvantaged group in executive committee • Awareness raising on constitution and OP • Public auditing • Women's empowerment program • Scholarships for children from landless, disadvantaged and poor families • Land allocation for poor and disadvantaged groups (DAGs) • Women health programs • CFUG management • Coordination and linkage with other stakeholders, etc.
Physical infrastructure development	• Construction and maintenance of forest roads and fire lines • Construction and maintenance of conservation pond • Community building construction • Picnic spot development • Irrigation canal improvement • Drinking water supply improvement • Toilet construction • Cremation ground construction • Temple maintenance
Income generation	• Log sale business and entrepreneurship development • Improved loading and unloading training • Improved log hauling equipment • Marketing exposure visits for finding alternative or better markets for furniture and agricultural tool handles • Book keeping and record keeping training • Revolving fund establishment and management • Wintergreen oil promotion • Bamboo product promotion business

Human resource development	• Community forest management training • NTFP management training • CF study tour • Training for vegetable farming • Village animal health care center establishment and village animal health workers (VAHW) training • Women health worker training • Metal-work training • Tailoring training • Bamboo skill development training • Bio briquette training

Source: Operational Plan of Hile Jaljale "Ka" Community Forest (2006)

The activities mentioned above in the revised OP for a five-year period clearly demonstrate that villagers are investing in all aspects of livelihood improvement of the local people. A major portion of investment is on the natural resource management sector, which covers about half of the total investment (Box 2). Thinning operations (marking, harvesting, and transportation of the logs) utilize most of the expenditure, followed by the investment in forage and fodder development and seedling production. Cattle and buffaloes are kept for dairy production. Since the local supply of grass and fodder is insufficient, every winter villagers have to purchase about 500 metric tons of paddy straw from outside the community, spending NRs. 2 million (approximately US$ 27,000). Therefore, almost all households want to produce more of their own fodder and forage.

One-third of the investment is allocated to physical infrastructure (see figure 1). A major portion of this is allocated for forest road construction and maintenance. The roads will benefit users considerably as easy access will bring higher prices for forest products and will promote tourism. Water conservation pond construction activity has second priority in relation to budget allocation. Ponds will be used to irrigate vegetable plots during the winter season, benefiting both upstream and downstream farmers. Community buildings will also be a priority, including construction of a multi-purpose community learning center and guest house which will be constructed on the grounds of the school supported by the CFUG.



Source: Operational Plan of Hile Jaljale "Ka" Community Forest (2006)

Figure 1: Budget allocation for different activities with CFUG funds

The rest of the investment is allocated for human resource development, income generation, and social development activities. Human resource development activities are focused on development within the CFUG for carrying out different activities. These activities will contribute to the improvement of livelihoods of the poor people, as they will be involved in training on vegetable farming, animal health, women's health, forest management, metal work, and tailoring. Promotion of income-generation activities, like revolving fund establishment and management, bamboo product promotion business, and market linkage for furniture and agricultural tool handles, will also contribute to livelihood improvement and poverty alleviation. Improved log transportation equipment will be used to reduce log transport costs.

Investment in social change through capacity building programs includes activities related to strengthening governance, women empowerment programs, women's health programs, and scholarships for children from landless, disadvantaged, and poor families (each of 25 students will receive NRs. 2,000 – US$ 27 – per year). It is hoped that enrollment will increase and the dropout rate will decrease through this program. Likewise, women's health programs will minimize the suffering of women from prolapsed uteruses due to heavy workloads, lack of post-natal health care, and shyness about discussing problems. Land allocation programs for grass plantations and other income-generation activities will directly benefit to the poor and disadvantaged group members. For CFUG management, one full-time forest manager will be appointed to manage all CFUG activities under the direction of the executive committee. The manager will be supported by other part-time and full-time staff.

Equity in forest product distribution

The CFUG has a special subsidy policy for poor and disadvantaged people in forest products distribution. For the landless, poor, and disadvantaged groups, up to 100 ft^3 (around 3 m^3) of timber is given free of cost, while for others, the rate is NRs. 105 or US$ 1.40 per m^3. Dry firewood is free of cost for all the users, provided that they enter the forest without any equipment to collect it. For green firewood, the rate is NRs. 1 for landless, poor, and disadvantaged groups per backload and NRs. 3 for other groups. All users are allowed to collect leaf litter free of cost. Firewood and stumps will be given free to blacksmiths for making charcoal. Victims of natural calamities will receive up to 150 ft^3 (4.3 m^3) of timber free of cost. These distribution patterns of the CFUG will also contribute to the livelihoods of the poor and disadvantaged groups, as they will get many forest products free of cost.

Implementation of operational plan activities

While Jaljale "Ka" CFUG is now implementing the program as mentioned in the OP. So far, they have marked the trees in block 2.1 and 2.2 for thinning and have already auctioned the logs at the price of NRs. 110 per ft^3 (NRs. 3,880 or US$ 52 per m^3) at road head to the contractor. Felling, sectioning, and transporting of the trees will be done by CFUGs using local people. In this way, employment will be generated for the local poor. They have already planted improved varieties of grasses in the block marked for thinning and a demonstration plot has been established to study the impact of different thinning operations.

On the basis of the approved OP, the CFUG is making a detailed annual plan for investment in different activities. The Hile Jaljale "Ka" CFUG is also affiliated with a recently formed pine plantation forest network intended to make market linkages and get more benefits from the sale of pine logs.

Implications for sustainable forest management

This case study is an initial step to demonstrate the potential of active management for the improvement of forest health implementation and increased employment opportunities in rural areas. However, there are challenges to be faced because the resource is managed by a CFUG which does not yet have appropriate silviculture, harvesting, marketing, and governance-related skills adequate for the successful management of pine plantation forests. Therefore, the following recommendations should be considered:

- CFUGs should use scientific forest management practices, like thinning, that provide for long-term sustainable use of local forest resources, and they should incorporate silvicultural prescriptions in revised OPs based on thinning guidelines.
- There is an inadequate understanding of plantation forest management beyond establishment and protection. Hence, there is a need to introduce skills and appropriate technologies relating to thinning, pruning, harvesting and marketing that can be practiced by the communities.
- CFUGs should give judicious consideration while setting the management objectives of plantation forests and these should match with the people's needs and interests.
- There should be separate and clear enabling legal procedures for CFUGs to harvest, transport, and sell their timber and other forest products.
- Thinning guidelines should be approved by the GoN for national-level implementation.

Conclusion

The pine plantations of Sindhupalchok and Kabhre Palanchok districts have the potential to generate more than NRs. 1 billion (around US$ 15 million) every year, which works out to NRs. 25,000 (US$ 340) per year per household, if scientific management, including thinning regimes, is introduced. In addition, it will also improve the plantation health and improve employment opportunities in rural areas during the agricultural off-season.

Nepal has substantial areas of pine plantation with significant potential that is largely untapped. With basic management interventions, these plantations could be used to improve rural livelihoods, alleviate poverty, and support the development of wood-processing industries. This has been shown by the case study of Hile Jaljale "Ka" Community Forest, where a CFUG is capable of generating more than NRs. 14 million (around US$ 189,000) in a five-year period and investing in natural resource management, physical infrastructure development, social capital formation, capacity building, and human resource development activities.

The case of Hile Jaljale "Ka" Community Forest demonstrates that there is a great potential for generating financial capital from the active management of overstocked pine plantations which could be reinvested for the improvement of livelihoods of the rural poor and disadvantaged groups. For this to happen, CFUGs have to unlock the productive value of pine plantation forests.

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8

Managing the Risks of Community-based Processing: Lessons from two Community-based Sawmills in Nepal

Mark Kelly
URS Corporation
Australia

Prabhesh Aryal
Nepal-Australia Community Resource Management and Livelihoods Project
Nepal

Introduction

The development of community-owned and operated sawmills is often proposed as a way for local communities to increase their returns from harvesting community forests. However, sawmills represent significant investments that, if they do not succeed, can create a substantial burden for local communities.

This paper examines the experiences of the Chaubas and Shree Chhap sawmills in the Kabhre and Sindhu districts of Nepal. These sawmills were established to process timber originating from community forest plantations. The plantations have been established by community forest user groups with assistance from a series of Nepal-Australia forestry projects since the 1970s.

The experiences of the Chaubas and Shree Chhap sawmills illustrate some key factors that should be considered when planning and implementing such investments. These include financial and economic returns of alternatives, risks associated with the investments, community business skills, market access and the policy environment. The lessons learned from these experiences are presented in the form of a checklist of issues that could be used in the planning of future community sawmill investments.

Background

This paper draws on the experience of two community-owned sawmills in the Kabhre and Sindhu districts of Nepal, east of the Kathmandu valley. The sawmills were established as community-owned operations to add value to logs produced from community owned plantations.

There are currently around 20,000 ha of community-owned plantations in these two districts of Nepal. They were established by local communities with the support of a series of Nepal-Australia forestry projects. Australian support commenced in the 1960s and developed into a number of projects dating from the 1970s that emphasized reforestation of degraded land, forest protection, and establishing community forest user groups (CFUGs). The final project, the Nepal-Australia Community Resource Management and Livelihoods Project (NACRMLP), has recently been completed, bringing an end to more than 35 years of assistance in this area. The experience of Nepal with community forestry, and particularly activities in these two regions, has made a vital contribution to the development of approaches to community forestry around the world.

The establishment of the plantations has delivered both landscape changes leading to environmental benefits, as well as providing a source of income for very poor communities. Local communities have benefited through increased availability of wood and non-wood forest products. However, Collett *et al*. (1996) note that more complicated value-added processing can place a strain on CFUGs.

While utilization of the community forests in the project districts is still in its early stages, a baseline survey conducted by the NACRMLP in 2003 illustrated the importance of logs and timber products in income generation by CFUGs. Over the five years to 2002-03, the sale of logs and sawn timber accounted for 45% of the total income of NRs. 5.8 million (i.e., US$ 35,900 of a total income of US$ 79,800) generated by the CFUGs that were included in the survey (Table 1).

Table 1: Sources of CFUG income (proportion of total income)

Year	Fuel wood	Timber	NIFP	Seeding	Grass	Grants	Fines	Interest	Visitor Fees	Annual Levy	Other
1988/99	46.1%	15.2%	2.5%	0.0%	0.7%	12.5%	1.6%	2.3%	0.6%	17.0%	1.4%
1989/00	12.8%	48.8%	6.4%	0.5%	0.4%	6.8%	1.4%	1.9%	1.5%	17.1%	2.3%
2000/01	11.1%	49.0%	2.3%	0.4%	0.6%	4.4%	1.4%	3.4%	0.6%	20.5%	6.3%
2000/02	4.9%	61.6%	4.0%	0.5%	0.7%	10.3%	0.7%	2.7%	0.2%	9.1%	5.2%
2000/03	10.4%	42.0%	10.3%	0.1%	2.7%	6.3%	1.4%	3.2%	0.2%	20.1%	3.3%

Source: NACRMLP (2003a)

Most of the plantations were established between the early 1980s and the early 1990s and are now 15–25 years old. They consist mostly of pine (*Pinus roxburgii* or *P. patula*). The need for thinning of the plantations, together with the desire to produce income after years of investment in plantation establishment, protection and management, led to the idea of community-owned sawmills.

Development of the sawmills

Following feasibility investigations (Jackson *et al*. 1995; Ladley 1995), the Chaubas sawmill was established in 1996 in Kabhre district. It was jointly owned by four CFUGs (Chapani Kuwa, Faga Khola, Dharapani Hile and Rachhama). Another CFUG sold logs to the mill, but was not an owner. Operation of the sawmill was managed by a committee of representatives from the CFUGs that owned the sawmill. The sawmill management committee employed a number of managers over its life, including individuals from outside of the local community and the region.

The establishment of the sawmill was supported by a loan from the Nepal-Australia forestry project, as well as funds from the participating CFUGs. The mill subsequently was upgraded from a 24" (61cm) to a 36" (91cm) band saw with funds raised by the CFUGs themselves through the sale of logs.

The Chaubas sawmill has a capacity to process around 150 ft^3 (approximately 4 m^3) of round logs per day based on an 8-hour day. Operation of the mill is limited to a maximum of around eight months because of limitations imposed by the wet season, meaning that its annual capacity (based on a single shift) is around 25,000 ft^3 (approximately 710 m^3) per annum or a sawn timber output of around 10–12,000 ft^3 (approximately 285-340 m^3) per annum. Logging generally occurs over four months in the dry season.

The Chaubas sawmill was initially established with a view to producing sawn timber for local sale and to create a revolving fund for community development activities. However, it was soon realized that local demand was not sufficient to consume the quantity of timber produced, and that sales to outside markets would be required.

The Shree Chhap sawmill was established in 2002 by a single CFUG (Shree Chhap Deurali CFUG), which utilized its own funds to build the mill. A manager was employed to run the day-to-day operations of the mill.

Production capacity of the Shree Chhap sawmill is similar to that of the Chaubas sawmill. The investment funds for the sawmill were generated from the sale of logs. Some assistance was

also provided from the Nepal Australia forestry project in the form of training and associated capital expenses. The decision to invest in a sawmill followed a tour by CFUG members of sawmilling operations in the western areas of Nepal. However, no detailed feasibility study or business plan was completed prior to investment in the mill. The sawmill processed its own logs as well as logs from nearby CFUGs.

Both sawmills generally produced the largest dimension timber (flitches) as was possible from the small logs they were utilizing. This sawing strategy was consistent with the available markets for the timber produced and the simplicity of the sawmills.

Performance of the sawmills

The major motivation for both sawmills was the desire to generate income for the local communities from direct employment in harvesting, transport and milling of the plantation resources. Another important motivation was the reinvestment of profits from the sawmill operations into community development activities according to the collective wishes of the people. However, as illustrated in Table 2, the financial performance of the sawmills proved to be variable and generally did not live up to expectations

Table 2: Financial performance of the Chaubas and Shree Chhap sawmills ('000 NRs.)

	1996	1997	1998	1999	2000	2001	2002	2003	2004
Caubas sawmill									
Income									
Timber	192	1,503	1,788	449	1,207	77	790	856	
Other	42	1	1	1	1	6	0	0	
Total income	234	1,504	1,789	449	1,208	83	791	856	
Costs									
Logs		777	620	520	534	109	477	193	
Other	223	816	883	373	642	254	570	406	
Total costs	223	1,593	1,503	892	1,176	363	1,047	599	
Net profit/loss	11	-88	286	-443	32	-280	-256	257	
Net profit/loss (US$)	150	-1,196	3,864	-5,989	427	-3,781	-3,458	3,470	
Shree Chhap sawmill									
Income									
Timber							389	15	13
Other							263		2
Total income							652	15	15
Costs									
Logs							185	19	
Other							85	44	39
Total costs							270	63	39
Net profit/loss							382	-48	-24
Net profit/loss (US$)							-5,159	-650	-320

Source: NACRMLP (2005), exchange rate US$ 1 = NRs. 74, costs for Shree Chhap include costs of running CFUG.

The Chaubas sawmill made a profit in four of the eight years for which data were available, but over this time made a cumulative loss. The Shree Chhap sawmill made a sizeable profit in the first year, followed by two years of losses as the volume processed dropped, but had a cumulative net profit over three years. A large contribution to the profit in its first year of operation was from sawing logs on behalf of CFUGs other than the sawmill owner. However, the CFUGs supplying logs suffered large losses since there was difficulty in selling much of the sawn timber produced, and thus returns were much lower than expected. Consequently, at least two of the CFUGs decided the sawmill should not process their logs in subsequent years; rather, they would sell logs only.

The longer term viability of either sawmill is unclear. The Chaubas sawmill continues to operate as a community-owned sawmill, but is considering alternatives that might provide better returns. Options being considered by the Chaubas sawmill management committee include potential management by a private sector contractor, as well as future sale of the sawmill. The Shree Chhap sawmill has recently been taken over by a consortium of private owners. As a mill owned by only a single CFUG, it appears that it was easier for it to make the decision to have private operators take over the sawmill, particularly as the sawmill had been largely inactive since its first year of operation.

Factors influencing financial performance of the sawmills

An overriding factor that reduced the ability of both sawmills to operate effectively was the uncertain security environment caused by Maoist rebels operating in each district. In general, this disrupted the ability to buy and sell logs and to sell timber (access markets). Notwithstanding this situation, a number of other factors contributed to the financial performances of both sawmills being lower than expected. These included:

- **Production of low quality timber reduced price and marketability.** The pine timber produced from each sawmill could only be sold as low quality construction material, which attracted relatively low prices. Difficulty in finding markets for some timber after it was produced meant that the quality of timber declined over time, which led to it being sold for prices up to half that planned. In general, timber was only marketed after it was produced. The price received for timber sold was also influenced by it being produced in shorter lengths than market norms. This arose from the need to transport logs by hand, which meant that logs were generally cut to a maximum length of 6 ft (around 2m). In addition, larger girth logs were often split down the middle in order to carry them by hand, which reduced sawmill recovery. There was also only limited adoption of appropriate air drying practices for the timber produced, leading to a lower quality product available for market.
- **Harvesting and transport costs were much higher than planned.** The cost of logs delivered to the sawmills from CFUG forests was much higher than expected, at around NRs. 35–40 per ft^3 (approximately NRs. 1,324 or US$ 18 per m^3), almost double the projected cost. A contributing factor to this outcome was the idea that the sawmills would take all logs produced by CFUGs. This was in contrast to commercial log buyers who generally only take the better quality logs. Another factor that contributed to higher costs was disruption to implementing the forest operational plans of some CFUGs. Disputes over benefits from harvesting sometimes disrupted and delayed harvesting, while in other cases delays were caused by matching operational plans to actual operations, and the need for cumbersome regulatory approvals.

- **Sawn timber recovery rates were low.** Actual recovery rates proved to be around 40% compared to an expected 50%. This reflected the smaller logs being sourced from plantation thinning and was exacerbated by the practice noted above of the sawmills taking all logs produced in harvesting operations.
- **There was limited business planning.** Business plans were not developed for either sawmill prior to investment. The Chaubas sawmill later developed business plans as part of trying to improve its performance, but the Shree Chhap sawmill never had a business plan. The promise of financial returns from the sawmills without clear business plans meant that expectations of CFUG members were raised while the complexity of running a sawmill business was not adequately understood. In more recent times, efforts were made to involve experienced sawmill owners from Kathmandu in business planning for the sawmills, which proved to be a valuable learning tool. However, this was frustrated by a deterioration in the security situation, which made it difficult for these businessmen to visit the sawmills.
- **Government policy and processes added costs and increased risks.** Government approval processes for production and movement of logs and sawn timber were cumbersome. The need for multiple approvals often required sawmill managers to visit local officers, which increased costs. In addition, these delays combined with formal and informal charges associated with the approvals increased costs. The need for multiple approvals also delayed operations and the marketing of timber. Uncertainty associated with the approvals increased risks. In addition, at one point the imposition of a 40% tax on log sales (later removed) and local rulings on felling trees adversely affected harvesting, which in turn had a negative impact on sawmill operations.

The management committees responsible for both sawmills appear to have suffered from insufficient focus on financial outcomes, and did not adequately respond to factors that adversely impacted on profitability. However, it appears that other external factors outweighed management capacity as the key reason behind relatively poor financial performance by the sawmills.

Comparisons with log sales

Because the profit performance of the sawmills has not met expectations, the relative value of the next best alternative, the sale of logs, was examined by the NACRMLP. In both districts, private log buyers were active and generally purchased logs at the roadside or on the stump. It should be noted that the security situation in both regions generally curtailed these activities.

The relative attractiveness of log sales versus sawn timber was conducted though analysis of the residual value of each operation. In purely financial terms, that point along the production chain at which the greatest net value can be realized by the forest owner is the point at which the product should be sold. Thus, the CFUG could sell stumpage (i.e., the standing tree), logs at roadside, logs delivered to a sawmill or sawn timber, depending on how much profit they want to make and how much they want to invest and extend their activities (i.e., take on risk). The product value along the production chain increases, but so also do the production costs and related risks.

Table 3 provides the data for such an analysis. The residual value estimated for sawn timber production is based on operational costs of a community sawmill, while that for log sales is based on typical prices received from sales to agents acting on behalf of sawmills from Kathmandu and surrounding areas. The analysis shows that log sales are likely to provide a

greater return to forest growers than sawn timber from a community sawmill, assuming 50% recovery.

Table 3: Indicative residual value analysis for log sales and community sawmilling

Item	Sawn timber NRs. Per ft^3	Sawn timber values converted to NRs. Per ft^3 log volume	Logs NRs. per ft^3	Comments
Price of sawn timber at roadside	200 (US$ 95 per m^3)	100 (US$ 48 per m^3)		
Transport cost of sawn timber from sawmill to roadside	25 (US$ 12 per m^3)	12.5 (US$ 6 per m^5)		
Ex mill door value per ft^3 sawn	175 (US$ 84 per m^3)	87.5 (US$ 42 per m^3)	1,788	449
Sawmill processing cost (NRs. Per ft^3 log vol)	50 (US$ 24 per m^3)	25 (US$ 12 per m^3)	1	1
Log value per ft^3 in the mill yard		62.5 (US$ 30 per m^3)	1,789	449
Transport of logs from roadside to mill yard per ft^3 log vol.		15 (US$ 7 per m^3)	70 (US$ 33 per m^3)	Col. 4 gives value of logs for sale at forest roadside to a private buyer
Harvesting costs (logs stacked at forest roadside) per ft^3		30 (US$ 14 per m^3)	30 (US$ 14 per m^3)	
Residual log value/ft^3		17.5 (US$ 8 per m^3)	40 (US$ 19 per m^3)	Stumpage (value of standing tree)

Source: NACRMLP (2005); dollar per m^3 equivalent is shown in brackets.

This residual value analysis suggests that the sawmills from Kathmandu and surrounding areas buying logs at roadside can afford to pay more than community-based sawmills. The former have economies of scale and are also sawing higher quality logs from sal (*Shorea robusta*) and native chir pine (*Pinus roxburghii*). In addition, they have more sawmilling experience and lower marketing costs than the community sawmills.

Whether or not the poor returns to forest owners can be offset by additional local employment and income generated by community sawmills is not easy to determine, but the history of the sawmills suggests not. Residual price analysis suggests that communities would need to value the additional benefits of local employment at NRs. 22.5 per ft^3 (NRs. 794 or US$ 11 per m^3) of logs processed to offset stumpage differences. Based on an input of 10,000 ft^3, the sawmill would need to employ labour to the value of NRs. 225,000 (US$ 3,040). For an average rural wage of NRs. 70 per day (US$ 1), this equates to around 3,200 working days. If the sawmill worked for half the year, it would have to employ around 18 people, which is considerably more than are actually employed. The Chaubas sawmill at full production only employed around 10 people (four laborers, four machine operators, one guard and one manager).

Log harvesting and transport actually employs more, particularly poor people, further reinforcing the attractiveness of selling logs, compared to sawmilling.

Risk associated with alternative activities is another factor to consider. An activity providing lower returns may be more attractive if it is also associated with lower risk. The capital required for a sawmill suggests there is considerably more risk borne by communities making such investments than those involved in log sales only. Furthermore, while there is considerable risk of not being able to sell stocks of sawn timber if there is a market down-turn, trees can be left to grow without deteriorating when demand falls off.

Lessons

Despite the financial performance of the sawmills not meeting expectations, the local communities have learnt much from their construction and operation, particularly the importance of marketing and business planning. The sawmills also provide valuable lessons for other community forestry sawmilling operations. The major lessons arising from the experience of the Chaubas and Shree Chhap sawmills are:

- **Thorough feasibility studies should be undertaken prior to investment.** Assessing the feasibility of proposed investments is always important, but particularly so where communities have not had direct experience in managing sawmills or similar commercial businesses. The feasibility assessment should directly involve local communities and not be conducted solely by an external party. The involvement of the community will help build understanding of the multi-faceted nature of running community sawmills and form a solid base for business planning skills development. The feasibility study should include detailed analysis along the production chain from the forest to the end use market, as well as identifying labor and capital needs. Costs of production and marketing need to be directly linked to similar operations if available, and market price estimates need to account for cyclical movements in timber markets. The risk associated with individual cost and return estimates also needs to be quantified. Quantifying risk is particularly important for poor communities, for whom risky investments can have significant adverse impacts. It is also important to understand the level of business skills amongst members of the community and, where required, to incorporate training from experienced business people in business management skills.
- **Examine alternative investments and alternative structures.** Possible alternatives to the sawmill investment should be clearly identified and the relative costs and returns compared. For example, comparing returns from the sale of logs to production and sale of sawn timber using value chain analysis should be done for all potential sawmill investments. Further processing does not always result in higher value returns. The risks associated with alternatives should also be clearly identified. It may be that the added value associated with a sawmill investment comes only with higher risk, and this needs to be part of the investment decision. Potential alternative management structures should also be considered. For example, should an external manager be involved? Is there potential for a joint venture with an experienced sawmill operator? Should management be contracted out?
- **Business planning and business management are vital.** Business planning is an ongoing process, and local communities need to develop these skills throughout the investment appraisal and implementation. Involving communities in a thorough feasibility assessment will help develop business planning and management skills. There are many formulas for the development of business plans, but a risk associated with using such models is that business planning becomes too process-oriented, i.e., business planning focuses

on producing a document rather than a real consideration of factors vital to business development and performance. One good way to promote business planning and management skills is to involve experienced sawmill operators in the project feasibility assessment, as well as in providing business skills training.

- **Development of marketing skills.** Identifying target markets, understanding how prevailing prices are determined in those markets, and making links with buyers (including potential forward contracts) are all vital to successful sawmill operations. These factors must be considered as part of the feasibility assessment and business planning processes, and there needs to be a clear strategy developed to ensure that the sawmill managers develop and apply these skills. Again, involving experienced sawmill operators/managers can be very valuable in this process. A common motivation for community-owned sawmills is the desire to capture margins earned by middlemen. However, it needs to be recognized that middlemen also provide valuable marketing services that have costs and require specific skills.
- **Analyze risks associated with project investments.** The importance of considering risks has already been outlined as part of feasibility assessment and business planning. However, the potential impact of risk on small communities warrants specific mention.
- **The policy environment can have significant impacts on the viability of community sawmill investments.** There are many aspects of government policies and their application that can directly affect the outcomes from community sawmill investments. These can range from market access issues, through approvals required for sawmill development and operations, to the prices paid for logs and taxation arrangements (formal and informal) for sawmills. The potential for governments to change policy that directly impacts on the viability of investments needs to be considered as part of the risk analysis.

Many of these lessons are well known and would not be new to those involved in assisting the development of community-owned enterprises. However, there is a risk that the assessment of such investments is sometimes undertaken on a one dimensional basis, i.e., only a single option is considered based on an already formed view of what the investment should entail. In this case, there is a real danger that the feasibility analysis unconsciously sets out to confirm preconceived ideas and does not adequately examine alternatives or relevant risks. This tends to go hand in hand with unrealistically raising the expectations of communities, which then makes it difficult to make decisions not to proceed. These decisions become even harder once investments have been made.

The costs and difficulties associated with changing investments and the potential adverse impacts of failed projects on poor communities emphasize the importance of a thorough feasibility assessment. Such assessments should involve local communities as well as independent advice from experienced operators in local markets. While this may add to the time and costs of investment, it would appear worthwhile to fully understand the risks and alternatives. The following checklist (Table 3) has been prepared to assist those considering community sawmill investments.

Table 3: Checklist for community sawmill investment analysis

Component	Key issues	Approach
Feasibility analysis	• Clarify goals of forest management and sawmill enterprises • Estimate costs for each component of the sawmill operation including log price, harvesting and transport costs, processing cost, and marketing costs • Estimate returns based on identified markets, product specifications, customers and prices	• Where possible, base estimates on actual cost information from other operations • Involve people with direct experience in local markets and sawmill operations • Ensure communities understand the opportunities and constraints of forest-based enterprises, and involve them in preparing and analyzing the estimates
Alternative investment options	• Conduct value chain analyses of alternatives to sawmilling – sale of logs (at roadside or stumpage) and other processing options (where applicable) • Use actual market prices in the analysis	• Ensure communities understand the relative risks and returns associated with alternative options
Risk analysis	• Quantify risk along the production chain • Detail specific actions to mitigate risks	• Ensure communities understand risk and develop approaches to its management • Quantify risk analysis in feasibility assessment
Business planning	• Prepare a business plan prior to making any investment • Continually review the business plan to deal with changing circumstances	• Use local commercial sawmill operators in training and development of community business skills
Management skills	• Ensure that management arrangements are clearly articulated and agreed by the community • Examine alternative management and ownership structures for the investment e.g., joint ventures, contract management of sawmill	• Use local commercial sawmill operators to provide management training

Component	Key issues	Approach
Marketing skills	• Clearly articulate arrangements and responsibilities for marketing of products including quantity, customers and prices • Identify costs associated with marketing of sawn timber	• Where possible, base estimates on prevailing market values • Understand the costs and services provided by middlemen
Policy environment	• Identify any government requirements for approvals associated with sawn timber production and marketing • Assess the impact of approval processes on the cost of operations • Identify potential policy changes that could impact on the sawmill business	• Include formal and informal costs
Management structures	• Ensure there are clear lines of responsibility and accountability for financial performance • Provide regular monitoring and evaluation of financial outcomes	• Ensure consideration of alternative management options such as contracting out management to private sector operators

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9

Can Timber Rents Better Contribute to Poverty Alleviation Through Community Forestry in the Terai Region of Nepal?[1]

James Bampton
Livelihoods and Forestry Programme
DFID, Nepal

Bruno Cammaert
Biodiversity Sector Programme for the Siwaliks and Terai
SNV, Nepal

Introduction

Only about 10% of the 14,000 officially established community forests in Nepal are found in the 20 districts defined as Terai by the Central Bureau of Statistics.[2] These forests cover a little over 200,000 ha, which is less

1 *A more detailed version of this paper is available at the author's personal website: www.freewebs.com/jiminnepal*

2 *Almost half the nation's population reside in these districts that comprises only 23% of Nepal's territory (CBS 2005)*

than 20% of the forest cover in the Terai outside protected areas.[3] Nevertheless, approximately 16% of the Terai population, or 320,000 households [4] (nearly two million people), benefit from 100% rights to forest products through community forests imparted under the Forest Act (1993), Forest Regulations (1995), and 1st Amendment (1998) (Bampton and Shrestha, in press), though a recent series of Financial Ordinances impose some taxes on Terai Community Forests. The remainder of the forests in the Terai is either in protected areas,[5] or under Government "management," with negligible areas under Leasehold or Religious Forestry.

The natural forests of the Terai region are rich in economic terms, due to the abundance of high-value timber species such as sal (*Shorea robusta*), sissoo (*Dalbergia sissoo*) and khair (*Acacia catechu*) (Van Schoubroeck *et al*. 2004; Hill 1999), which have relatively fast sub-tropical growth rates (Pesonen 1994; Rautiainen 1995). The relative easy access of Terai forests and markets also makes the realization of timber rents easier. Despite historically providing revenues to the ruling classes,[6] it was not until the 1970s that the first attempts at formal forest management planning were made through the Department of Forests (DoF), though these plans were never fully implemented (Adhikari *et al*. in press; Sigdel *et al*. 2005; Baral 2002). During the 1990s, recognizing that the existing passive management was unsustainable (Pesonen 1994; Pesonen and Rautiainen 1995) a new attempt was made with Finnish technical assistance, resulting in technically sound (for timber production) Operational Forest Management Plans (OFMPs) for 19 of the Terai districts. However, as these plans did not involve local people or attempt to reconcile their livelihoods needs, and restricted community forests to degraded areas of forest, the OFMPs were not accepted by the local population. A lack of central government funding for implementing these plans, combined with an ill-advised and unclear ban on green tree felling, further hampered the success of the OFMPs (Baral 2002).

Since then, most Terai forests have remained under Government "management," which in practice involves little more than the collection of illegally cut forest products, or the periodic removal of dead, dying and fallen trees through annual harvesting quotas assigned to District Forest Offices (DFO), the Timber Corporation of Nepal (TCN)[7] or District Forest Product Supply Boards (DFPSBs) (Acharya *et al*. 2006). The important point regarding government management is that timber rents from Government-managed forests are not seen

3 Precise figures for forest areas are difficult to come by as most estimates focus on natural forest within the national forest estate. However, large areas designated as national forest do not actually have forest cover, and 7.7% of community forest in the Terai is actually plantations, some of which is outside national forest and therefore not included in overall forest areas.

4 This is the total number of households registered as members of CFUGs. However, there is no data on the degree of duplication, as some are members of more than one CFUG - hence the figure is likely to be a slight overestimation

5 There are five protected areas in the Terai - two national parks and three wildlife reserves covering 17% of Terai forests (DoF 2005). Around the PAs are Buffer-zones (BZs), in which at least 57 BZCFUGs currently manage around 14,500 ha (Bampton and Shrestha, in press).

6 For example, sleepers for India's expanding railway network during the British colonial era (e.g., Adhikari et al. in press).

7 The TCN is a para-statal enterprise established in 1959 with initial objectives of supplying timber and fuelwood to Kathmandu Valley and exporting the surpluses to India, although it soon developed into an intermediary timber supply agent obtaining trees from DFOs at the Government rate and selling at a higher price to private wood merchants. It has passed from the jurisdiction of the Ministry of Forests and Soil Conservation to the Ministry of Supply and back again, and in 1998 the Government of Nepal made a decision that authorized the TCN as a sole dealer for selling timber and fuelwood in 33 Terai and Inner Terai districts (Shrestha R.B., pers. comm.). In 2000, the decision was changed yet again, whereby TCN would be responsible for 50%, and DFOs the other 50%. The TCN has spent a considerable part of its existence in debt.

to contribute to local poverty reduction,[8] except perhaps through the employment generated by those contracted locally to undertake the harvesting. Only timber distribution through the DFPSBs aims at meeting local timber needs and targeting poor people. Unfortunately the DFPSBs are not functioning properly in many districts, resulting in inadequate timber distribution. Due to these inadequacies, local users (including the poor) obtain benefits from government forests through the illegal collection of timber and other forest products.

The socio-economic situation and history of the Terai, in relation to forestry, has been summarized in various studies (Adhikari *et al*. in press; Bampton and Shrestha, in press; Bampton *et al*. 2004; Laubmeier and Warth 2004). As many authors have noted (Sigdel *et al*. 2005; Bampton *et al*. 2004; MFSC 2003; Paudel and Pokharel 2001; Pokharel 1999), the most important characteristic influencing forest management and use in the Terai is the pattern of forest resource and population distribution. The Terai forests are mostly confined to the environmentally sensitive Churia Hills in many districts[9] and the Bhabar zone immediately to the south of these hills in other some other districts, while the Terai plains are largely devoid of large intact forests, with the exception of a few districts located primarily in the central and far western Terai.

The majority of the population live in the plains, with many located quite far from the remaining natural forests. It is also frequently noted that those populations living closest to the remaining forests are relatively recent migrants from the Hills, a demographic pattern that is linked to King Birendra's drive to populate the Terai following the eradication of malaria in the 1950s. Many of these recent migrants are technically illegal encroachers under the law (Acharya and Dulal 2003; Pokharel 1999; Bhatta 1998). Gaurev Integrated Development Associates (2003) estimated that as much as 70,256 ha of forest have been illegally encroached upon in recent years. Though there are celebrated cases of encroachers turning into forest conservationists through Community Forestry (referred to here as CF) (Pokharel 2000), encroachment remains a challenging issue in the region.

It is often argued that CF mechanisms will inevitably favor the few communities living close to the forest resources in the northern Terai districts, as opposed to those communities located in the southern districts that are farther away from the available forest resources (Sigdel *et al*. 2005; Singh 2005; Baral and Subedi 1999).[10] Community forestry will inevitably have less of an impact on overall poverty reduction in these southern districts, unless mechanisms are developed to have them included in, or benefit from, the Community Forestry program. While there is no poverty data to confirm the actual status, it should be noted that personal observations suggest that the southern Terai communities are generally poorer with higher population densities than their northern neighbors.

Complicating this proximity to the forest resource issue is the fact that there is no limit to the forest area that CFUGs can apply for, with situations arising where in some CFUGs, a relatively small number of households have captured an inordinate amount of forest resources, while other CFUGs have inadequate resources to meet even the basic needs of the community,

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8 Indirectly, through central and local government, forest revenues are reinvested in local poverty alleviation and basic services, although 10% of revenues are deposited with District Development Committees (DDCs).

9 57% of forests in the 20 Terai districts are found in hilly regions - Churia or Mahabarat hills (DoF 2005) Estimates of deforestation in the Terai have reduced from 1.3% for 1978-79, 1990-91 (DFRS 1999) to 0.06% for 1990-91, 2000-01 (DoF 2005).

10 In practice, CFs are handed over as requested to self-identified groups, and GoN policy has been to hand over small patches along the fringes that can only realistically serve users situated nearby. Unless the size of CFs increases, it is impractical to include distant users in CFUGs. Bampton et al. (2004) demonstrated for 3 Terai districts that on average, CFUGs managed areas/household equal or less than the district forest:household ratio, although this is dragged down by some small CF plantations outside the natural forest with high numbers of users.

let alone contribute to poverty reduction (Bampton and Shrestha in press; Iverson *et al*. 2005; Chhetry *et al*. 2004; Bampton *et al*. 2004; NORMS/ODG 2003).

For these reasons and others, the Government of Nepal (GoN) issued a revised forest policy (MFSC 2000) that prevents community forests from being handed over to CFUGs in large, contiguous blocks. The policy also mandates that production forest resources would be managed through a new modality called Collaborative Forest Management (CFM), where the management responsibilities and benefits are shared between the central Government through the District Forest Offices (DFOs) and local governments through District Development Committees (DDCs), Village Development Committees (VDCs), and elected CFM committee members representing both nearby and distant forest users. The Government argues that, as it is responsible for Government-managed national forests, it can develop management plans through collaboration with whomever it chooses. The legal basis for this position remains disputed (Bhattarai 2006).

CFM attempts to: (i) develop sustainable forest management; (ii) fulfill the needs for forest products; (iii) help in poverty reduction by creating employment; (iv) maintain and enhance biodiversity; and, (v) increase national and local income through active management of the Terai and inner Terai forests. [11] This paper compares Community Forestry with CFM, but does not analyze the CFM modality in depth for a number of reasons: it remains confined to less than 7,000 ha where it is still being piloted, cost and benefit sharing levels and mechanisms have not yet been clearly established, [12] and some important stakeholders continue to have strong reservations about it. [13]

This paper principally examines the impact of existing CF legislation, forest policies, and internal CF benefit-sharing practices on the realization of timber rents and their targeted redistribution to poor members of the CFUGs. It also briefly explores other pro-poor timber rent distribution systems practiced in the Terai and compares them with redistribution through CF. Finally, the paper provides some suggestions on how timber rents realized through CF could be increased and better contribute to poverty alleviation in the Terai region.

The case of community forestry

Impact of community forestry-related legislation and policies on timber rent realization and redistribution

The Forest Act (HMGN 1993) is supposed to give CFUGs autonomy to decide how to manage their allocated forests, and how to use or dispose of the forest products derived from them. However, in reality, there are a number of constraints on the decision-making freedom of CFUGs imposed by subsidiary regulations and the dominant paradigms of CF in Nepal, as well as the practice of CFUGs not always reflecting the theory. In order to understand how CF works in the Terai, it is essential to understand the fundamentals of

11 *For further information on how CFM evolved and where it is now, see Singh KC (2005); MFSC (2003); Sah et al. (in press) and Bampton et al. (in press).*

12 *Benefit sharing in CFM is currently 75% of revenues to central government, with 25% remaining at the district level - originally envisaged as 10% to DDCs, 10% to VDCs and 5% to CFM Groups. Current MFSC thinking makes benefit sharing of the district level 25% at the discretion of District Forest Coordination Committees (DFCCs), a large part of which would have to be reinvested into forest development (MFSC 2005). Suggestions for the revised CFM guidelines include changing the benefit sharing to 50-50 vis centre-district (Ebregt, A., pers. comm.).*

13 *The whole of Hamro Ban Sampada Vol. 3(2), published by ForestAction is dedicated to issues of CFM*

the legislation and how the various instruments introduced over time affect CFUG decision making, as well as the broader socio-economic context in which they operate.

Under the Forest Act (HMGN 1993) CFUGs may be formed to "develop, conserve, use and manage [the] forest, and sell and distribute the forest products by independently fixing their prices, according to an operational plan" (Section 25), "using the forest products for collective benefit … in the prescribed manner" (Section 41). The Act also specifies that "A users' group … shall be an autonomous and corporate body with perpetual succession", "… may acquire, use, sell or transfer, or otherwise dispose movable and immovable property like an individual" (Section 43), and "… shall have a separate fund of its own" which "… shall be operated in the prescribed manner" (Section 45).

The main features and spirit of the original legislation were concisely summarized by Joshi (1997):

- All accessible forests can be handed over to users (no area limit);
- The CFUGs have to manage the forests as per the approved constitution and operational plan (OP) of the allocated community forest;
- Any national forests suitable to be converted into community forests will not be given to other uses, such as leasehold forests;
- District Forest Officers (DFOs) can allocate areas of forest to a CFUG (it was previously the responsibility of Regional Directors (RDs), a higher authority);
- CFUGs can use surplus funds for any kind of community development works;
- A CFUG is an autonomous and corporate body with perpetual succession;
- A CFUG can fix the price of the forestry products irrespective of the government royalty;
- A CFUG can plant long-term cash crops (e.g., medicinal herbs) as long as they do not disturb the main forestry crops;
- The DFO can take the forest back from a CFUG if it contravenes the OP (agreement); however, the DFO must return it as soon as possible once the problem is resolved;
- CFUGs can transport any forest products simply by informing the DFO;
- CFUGs will not be beholden to any political boundary while handing over the forests;
- A CFUG can establish forest-based industries;
- CFUGs can amend the OP by simply informing the DFO;
- CFUGs can punish misusers (encroachers and thieves), who contravene the rules of the OP; and
- Any agency can help users to manage the community forest.

This legislation gives CFUGs considerable freedom to determine how they manage their community forest, though "everything" CFUGs want to do should be included in the OPs. The Forest Regulations (HMGN 1995) detail matters that must be included in an OP, but they do not state the duration of these plans. This is important, as section 26, subsection 1 of the Forest Act states that CFUGs "may make timely amendments according to need in the OP relating to the management of community forests, and must *inform* the DFO accordingly." It does not say "seek approval" of such amendments, which involves considerably higher transaction costs. Furthermore, subsection 2 states that only if such an amendment "is considered likely to adversely affect the environment in a significant manner" may the DFO "direct the users' group not to implement the concerned amendment in 30 days." Nevertheless, DFOs impose control over OPs, and 5-year plans are the accepted norm, followed by revisions that do require DFO approval. This does not give CFUGs the flexibility to prepare long-term plans for

the whole forest, and shorter-term plans for more detailed work in specific areas of the forest, and therefore increases unnecessary transaction costs.

More recent legislation, in the form of the First Amendment (HMGN 1998), prohibits forest-related industries from being located in the forest or within a specific set distance from the forest,[14] a further restriction on the prohibition not to locate such industries in a forest area as mandated in the Forest Regulations (HMGN 1995), thus imposing extra costs to transport raw materials to processing sites. The First Amendment (HMGN 1998) also made it necessary to undertake a forest inventory while preparing the OP. The Community Forest Inventory Guidelines (CFIG), first prepared in 2000, were updated in 2004 and remain highly prescriptive.[15] Furthermore, they go beyond just inventory, requiring conservative silvicultural prescriptions based on Annual Allowable Cuts (AACs) as a percentage of estimated Mean Annual Increment (MAI), which is simply not appropriate in many cases.[16] Forestry officials take these guidelines as if they were a mandatory directive, rather than guidance, as no other standards to evaluate OPs exist. The First Amendment also directs Community Forest User Groups to spend 25% of their income on forest development activities, although a clear definition of "forest development activities" remains elusive. Obviously, forest investment and management costs will vary from year to year, and cost effectiveness and sound financial planning should be encouraged in order to maximize profit.

The most recent legislative impact on timber rents from CF in the Terai comes from the imposition of taxes on the sale of timber of two species outside CFUGs. The idea was originally included in the Revised Forest Policy that was adopted in 2000, though it had no basis in law or regulation. Despite this, DFOs began collecting a flat 40% tax from such sales. The move was challenged by the Federation of Community Forest User Groups Nepal (FECOFUN) in the Supreme Court in 2003, which won the case. The tax was then legally authorized through a Finance Ordinance later in 2003, and has since been renewed every six months. During this time, the tax was momentarily applied to the whole country covering all species with a reduced rate of 25%, and finally restricted to a 15% tax rate on only *sal* and *khair* sales outside of the Terai CFUGs. This tax is on gross revenue, but is frequently referred to by forestry officials as a "royalty." It bears no relation to CFUG investments to realize such revenues, or to the needs of the CFUG for revenues. In addition to this, CFUGs are obliged to pay a 15% VAT on the same sales, though how this is calculated is still a mystery to the authors. The assumption is that the Government will use at least some of these revenues for implementing the 10th Plan, alternatively known as Nepal's Poverty Reduction Strategy Paper (PRSP), although it is highly unlikely that much of this will filter back to the communities involved in managing community forests in the Terai. Taxes such as these, and the instability of the overall system, encourage some CFUGs to minimize their external sales, which results in a decrease in overall timber revenues. This can translate into a loss of potential income for the CFUGs, and a loss of revenue for the Government of Nepal as well.

In summary, the CF legislation obliges CFUGs to incur management costs, some of which are not necessary, while at the same time restricting production from their forests to lower than potential levels. Furthermore, a share of Terai timber rents is taken by the Government in the form of taxes, irrespective of production costs incurred by CFUGs or their management

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14 Five km is the limit in the case of the Terai region.

15 e.g., CFUGs are required to measure regeneration throughout their forest, regardless of whether they intend to regenerate particular blocks (such as pole stage stands) or not.

16 e.g., the permitted allowable annual harvests in Dhuseri community forest in Nawalparasi district are calculated to be only a third of sustainable production potential of the predominately sal forest (NORMS 2003) as the growth rates are likely to be significantly higher than those projected in the CFIG.

and community development needs. As a result, the timber rents collected by CFUGs from Community Forestry are never as high as they potentially could be.

There are additional factors that contribute to timber rents collected by CFUGs being lower than they could be. A fundamental limitation on CFUGs is the prevailing paradigm that internal demand should be satisfied before any external sales are allowed, and that individual CFUG members should sell their share of forest products. An illustration of this thinking was the Ministry of Forest and Soil Conservation (MFSC) decision in April 1996 to release a circular stating that the forest product consumption demands of the local community and adjacent districts must be first fulfilled before a CFUG can sell forest products in other places (Kanel and Acharaya 2006). This was in conflict with provisions in the Forest Act and Regulation, but was viewed as a good intervention because it helped to meet local needs (Shrestha, R.B. pers. comm.). [17] Additionally, and in a typically restrictive fashion that is supposedly for environmental reasons, buffer zone (BZ) CFUGs are not allowed to sell any forest products outside their community (MFSC 2002). Other restrictions on CFUG decision making resulting from the prevailing CF paradigm preclude individual members from receiving a share of income from sales, restricting the use of employment generation as a tool to redistribute rents according to inputs by individual members. The impacts of such thinking will be further explored below.

Impact of internal Community Forestry management on timber rent realization and redistribution

Despite the legal and policy restrictions on CFUG decision making, it is still interesting to examine how CFUGs use their remaining discretionary powers and rents, and how these are influenced by the prevailing paradigm for CF in Nepal. It is noted that in many CFUGs nationally, not only in the Terai, the concept of "equality" is applied in theory, though concepts of "equity" are now being promoted. However, many CFUGs are actually employing a concept of "need" to determine who gets what, and thus the concept of "equality" changes to one of "equality of opportunity" only.

The reality is that these opportunities are not realized by everyone. Take for example the situation of fodder in the Kumarbarti BZCFUG in Nawalparasi district. The users comprise two main social groups, with distinct historical and cultural values and livelihoods systems. One group is composed of higher caste Hindus, many of whom have landholdings and livestock. The other group consists of Bote / Mahji, comparatively landless, fisher folk. The community forest provides fodder for those who need it, i.e., the higher castes with livestock. This has been valued as an annual benefit exceeding NRs. 30,000 (US$ 405) per household per year. The Bote / Mahji, who do not have livestock, are excluded from these benefits, and receive inadequate compensation in the form of a few extra headloads of far less valuable thatching grass (Ghimire 2004).

A similar situation arises with timber used within CFUGs, as documented by the detailed NORMS/ODG study (2003) covering 14 CFUGs in Nawalparasi and Rupandehi districts. It was commonly found that CFUGs sell timber internally to members at a price significantly lower than the prevailing market price, and the timber is often only sold in set quantities. However, those who avail themselves of this subsidized timber are those who "need" it, and who can still afford the subsidized price for the set quantity. "Need" for timber usually relates to

[17] A recent agreement between FECOFUN and MFSC maintains this paradigm, as it was agreed that CFUGs should first satisfy their own need, then that of neighbouring CFUGs, then the rest of the district, before being allowed to sell to others (MFSC/FECOFUN press statement 01/07/06)

house construction or maintenance, and this "need" is frequently greater for relatively richer households with larger houses. Furthermore, it is only the richer members who can afford to purchase timber, even at the subsidized price. Typical local market prices for sal timber are around NRs. 600-800 (US$ 8-11) per ft^3 (NRs. 21,200-28,250 or US$ 282-388 per m^3). A typical subsidized price for *sal* sold internally within CFUGs is around NRs. 150-300 (US$ 2-4) per ft^3 (NRs. 5,300-10,600 or US$ 70-141 per m^3). Therefore, many CFUGs as institutions are in effect forgoing at least half of the available timber rents, which in practice go to richer households at the expense of poorer CFUG members who can't afford to buy even at subsidized rates. The NORMS/ODG study refer to these as "hidden subsidies" whereby the poor in fact subsidize the rich.

This research has been recently summarized by Iverson *et al*. (2005), where they calculate that the potential net benefits for one CFUG, after subtracting administration and harvesting costs, could be NRs. 2.3 million (US$ 31,000) on an annual harvest of 5,000 ft^3 (142 m^3) if sold at market rates. These benefits amount to NRs. 3,839 (US$ 51) per member household, which is equivalent to the earnings from around 55 days of female agriculture wage labor. However, because of the CFUG's timber quota and pricing policies, 63% of the net benefits, worth NRs. 1.5 million (US$ 22,500), are usurped by the households awarded timber quotas. Awards of timber quotas in this case show stark distributional bias favoring wealthier households, as quotas are for 50 ft^3 (1.4 m^3) requiring an upfront payment of NRs. 15,000 (US$ 200), which poorer households are unable to pay. This policy therefore effectively excludes the poor from availing themselves of the "hidden subsidy."

Furthermore, the NORMS/ODG study detects a further hidden economy in a number of instances, whereby fund management is far from transparent, and corruption probable. The study reported that the CFUG harvested more than specified in the OP, which was under-reported by the CFUG committee who sold part of the extra volume illegally. There is no legal restriction on individuals selling their shares of CF timber, although the transport permits required and rent-seeking behavior of forest officials means that legal routes are generally avoided. It is known that at least a portion of CF timber is sold in this way (Shrestha, R.B. pers. comm.). Unfortunately it is impossible to get an idea of how prevalent these distribution systems are in the Terai region.

Nevertheless, some CFUGs have developed more equitable timber rent distribution systems. These include:

- Variable timber quotas based on poverty ranking. Member households are divided into rich, medium and poor households, whereby the highest quotas are provided to the poorest families.
- Variable and affordable pricing based on poverty ranking. Prices for timber are adapted to the wealth of member households. This allows affordable pricing for all members and to some extent prevents inequitable hidden subsidies. Prices applied to the richest member households are closer to the real market price, while prices paid by the poorest households are very low and therefore affordable for them. This system is sometimes combined with timber grading, where grade A timber is sold internally at a price slightly below the local market price, and grades B and C are sold at a minimum price, affordable to all households. If supply exceeds demand, timber grading is sometimes applied to optimize rents by selling grade A timber outside the CFUG to the highest bidder. Some CFUGs will distribute for free a predetermined annual quota to their poorest members or victims of natural disasters.
- Timber distribution based on demand and poverty ranking, where a special sub-committee examines individual annual demands made by members, verifies them and allocates timber using variable pricing based on poverty ranking. If demand exceeds

supply, some CFUGs apply a prioritized allocation system where the demands of the poorest households are met first.

Bampton *et al*. (2004) summarized points from CFUG sample data in 12 districts. They noted that Terai CFUGs actually sell less of their forest produce outside their groups than the hill CFUGs do (only 14% of their production against 24% for the hills). Due to the higher value of Terai forests, overall Terai CFUGs make up 35% of forest products sales from all CFUGs. [18] Interestingly, it also appears that forest product sales make up a smaller proportion of Terai CFUGs' overall income. More recent data from Rupandehi district showed that 89% of timber produced was used internally (Bampton and Shrestha in press). Although the national CF database held by the DoF contains no information on such matters and CFUGs are extremely lax in submitting annual reports and audited accounts, despite being compulsory by law, [19] the existing DoF data of CFUG sales outside their groups gives an indication that timber rents contribute substantially to CFUG income – some 890,000 ft^3 (25,200 m^3) of *sal* timber, [20] 470,000 ft^3 (13,300 m^3) of other species, and 14.2 million kgs of *khair* timber [21] (from data presented in Bampton and Shrestha in press). A simple calculation suggests that *sal* alone could provide an income in excess of NRs 100 million per year to Terai CFUGs at a market rate of NRs. 600 per ft^3 (NRs. 21,200 per m^3; and US$ 1.3 million per year). If Terai CFUGs are indeed using 80% of their production internally, and are selling this to their own members at only NRs. 300 per ft^3 (NRs. 10,600 or US$ 141 per m^3), they could actually be forgoing double the amount they currently generate from external sales (NRs. 200 million or US$ 2.6 million per year), as well as distorting local timber markets.

Regardless of the losses CFUGs experience in relation to the potential timber rents available to them, they still receive significant incomes from the sale of timber in the Terai. However, do Community Forest User's Group use these funds for poverty reduction? The answer to this is "partially." Kanel and Niraula (2004) report that only 0.88% of Terai CFUG funds are spent on pro-poor activities. A more recent study by Bampton and Shrestha (in press) shows that, at least in Nawalparasi and Rupandehi districts, CFUGs spent 5.32% and 3.28%, respectively, on targeted poverty alleviation programs. This is attributed to a raised awareness amongst CFUGs and willingness to contribute towards poverty reduction in line with Government, donor, and FECOFUN policy. Nevertheless, the impact of such programs has not yet been evaluated.

Community forestry does not contribute to poverty alleviation through targeted use of timber rents alone. In many cases, more equitable systems of forest product distribution have been developed, whereby the poorer or needier families receive additional concessions, such as free fuelwood (e.g., Janajagaran, Kalika, Sahara and Gautam Budda CFUGs of Kapilbastu district) or free timber for welfare support (e.g., Dhuseri CFUG in Nawalparasi reported by NORMS, 2003). A further initiative becoming more widely adopted recently is the allocation of small areas of community forests to poor families for NTFPs and timber production for their exclusive use. Such provisions are extremely important to poor households.

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18 Khanel and Niraula (2004) combine true Terai districts with semi-Terai districts that consist of Churia, inner-Terai valleys and Mahabarat hills. Nevertheless, these districts still only comprise <15% of all CFUGs in Nepal.

19 Bampton and Shrestha (in press) calculated from data available for seven Terai districts that over the last four financial years less than 40% of CFUGs have submitted annual reports. For the last fiscal year, only one CFUG out of the 100 or so in the three districts supported by the Livelihoods and Forestry Programme's Terai component has submitted its annual report by the stipulated deadline of one month after the end of the year (Paudyel, V. pers. Comm.).

20 This figure for the 20 Terai districts is incomplete (e.g., data for Sarlahi district for 2057/58 and 2058/59 is missing as records have been burnt by the Maoists). Similar data for five Churia and inner-Terai districts (Surkhet, Makwanpur, Sindhuli, Udaypur and Ilam) show that these districts have in fact had far more significant sal timber sales outside CFUGs (approx. 1.2 million ft^3 over the last five years)

*21 **Khair** (Acacia catechu) heartwood is used to extract **katha** (used for chewing with betel leaves) and cutch (used for tanning and dyeing) (Kayastha 2002)*

A large part of CFUG spending, although not directly targeted, probably also benefits the poor. However, it is argued by some that many community development activities have less benefit for the poor. For example, expenditures on schools will not benefit those too poor to send their children to school, or temple construction that lower castes are not allowed to enter. In addition, both Kanel and Nirauala (2004) and Bampton and Shrestha (2006) find that, in the districts surveyed, between 10% and 30% of fund expenditure is categorized as miscellaneous, i.e., not spent on forest development, CFUG operational costs, or community development (which includes pro-poor programs).

In order to understand how CFUG community expenditures benefit the poor, it is first necessary to know who the poor are, and what community development activities are undertaken. Situations are extremely variable in reality. Allison *et al*. (2004) demonstrate how CFUGs are able to address the livelihoods of their members through supporting a wide variety of activities of interest to users outside forestry *per se*. This reinforces interest in, and commitment to, "good" Community Forestry management. There is clear evidence that CFUGs are ranking wealth to identify their poorer members, and that CFUG funds are being used for income-generating activities (mainly agriculture or livestock related, although bee-keeping, shop-keeping, and trade skills development are also quite common). Other activities that have positive impacts on the poor are emergency funds for health or natural disasters, or for birth control. Finally, expenditures for improving CFUG governance also have positive impacts on the poor by increasing transparency in, and awareness of, CFUG activities and the poor's participation in CFUG decision making. However, the difficulties in sustainably reducing poverty are not solely financial, and CFUG funds are inadequate on their own.

Other timber rent realization and redistribution systems

Not all Terai forests have been handed over as community forests. A majority of productive Terai forests (block forests, not including protected areas, etc.) remain under direct government management. For government-managed forests, there are two main management systems producing timber rents. The first one is the direct management by the DFO; the second one is the newly established CFM mentioned earlier. For government forest managed by the DFO, an annual plan is created that allocates harvest quotas to the District Forest Office (DFO) itself, the Timber Corporation of Nepal (TCN) and the District Forest Product Supply Board (DFPSB). [22] Allocations to TCN only occur in districts with sufficient forest resources. Timber harvested by the DFO is auctioned (to the highest bidder) and rents are sent to the central treasury. The same commercial auctioning system is applied by the TCN. The price of timber sold by the DFO and the TCN are not within reach of the poorest within the district. Timber is bought by middlemen who sell it in urban centers where demand and prices are high. In theory, the DFPSB ensures local (within the district) forest product supply for household fuelwood consumption, agricultural implements and the construction and maintenance of houses. The DFPSB sells timber just above the royalty rate (e.g., NRs. 250 per ft^3 – NRs. 8,820 per m^3 – for *sal*) which again, is not within reach of the poorest. This system creates the same hidden subsidy as in the case of CF. In exceptional cases, the DFPSB can

22 The DFPSB and the TCN have their own funds to finance harvesting operations. In general DFOs (Terai districts) receive about NRs 200,000 Government funding each year for the harvesting of their quota. Forest products harvested by the DFO are auctioned (to the highest bidder) and all revenues, including the harvesting cost, are sent to the central treasury. The minimum auctioning price is based on a set royalty rate plus harvesting costs. The same commercial auctioning system is applied by the TCN. Revenues go to TCN after the payment of royalty to the treasury. The harvest of the DFPSB quota is done by the DFO on behalf of the DFPSB. The price of forest products sold by the DFPSB includes royalty, harvesting costs and a small profit margin. The DFPSB ensures the local (district) supply of forest products for household fuel wood consumption, agricultural implements and the construction and maintenance of houses. The DFPSB can supply forest products at 10% of the royalty rate to victims of natural disasters, for religious rituals, etc.

supply forest products at 10% of the royalty rate, for example to victims of natural disasters, for cremations and other religious rituals, etc. This type of distribution is in theory supposed to target the poorest, but the functioning of DFPSBs is less than optimal (Acharya *et al*. 2006).

Problems with the above modalities include:

- Forests are sub-optimally managed at well below their sustainable potential;
- real management costs are not accounted for, so profitability and efficiency is not enhanced;
- harvesting costs are arbitrarily fixed;
- sales systems are inflexible, inefficient and open to abuse; [23] and
- 90% of revenues accrue to the central treasury, with only 10% going to district level governments, such as District Development Committees (DDCs), with none going directly to local communities.

At issue is whether the central government, local governments, or local communities are better at using rents from forests for forest management and poverty reduction. Clearly, central governments are able to redistribute funds to poorer regions, which might not necessarily coincide with forest resource wealth. However, the central government is criticized for leakage, unnecessary costs, poor prioritization, and lack of knowledge of local needs, as well as sub-optimal forest management. Local governments have a closer link to the people of their districts and a better idea of needs and priorities relating to poverty reduction. However, local governments have limited capacity and also suffer from non-optimal use of funds through inadequate accountability systems, as well as no role in forest management.

In the case of Collaborative Forest Management, minimum prices for the sale of timber within the CFM User Group (if not sold outside to the highest bidder) have to exceed the government royalty rate, as CFM is expected to pay 75% of the royalty to the central treasury. This price, even far below the market price, would again be too high for the poorest CFM members and poses the same problems of hidden subsidy mentioned earlier. In order to sell timber at an affordable price to its poorest members, the CFM committee would have to use internal revenues to further subsidize timber prices.

Conclusions and recommendations

There are a number of policy and legislative constraints that reduce CFUGs' ability to maximize the benefits from timber rents. This is exacerbated by CFUGs' own policies of subsidizing sales within their groups. Therefore, if we want timber rents from CF to better contribute to poverty alleviation, we should work on improving internal and external regulations, practices, and corresponding monitoring mechanisms. In order for CF to contribute more to poverty reduction in the Terai, CFUGs would have to cover more poor users, including more distant users, through the allocation of more forest as CF.

Taxation of Community Forestry income should or should not be considered, depending on perspectives on whether governments or local people are better at using timber rents to alleviate poverty, whether the majority of the poor are members or not of CFUGs, whether CFUGs should contribute to the services they receive from the forest agency, and whether forest resources should be considered as a national resource. However, care should be taken

23 E.g., standing sales aren't undertaken, all timber is transported to depots for sale, grading is inadequate, fuelwood is cut into 2-ft lengths precluding alternative uses, large standard lots preclude small buyers, etc.

to ensure that taxation does not introduce adverse effects (e.g., suppression of sales outside CFUGs), is fair and progressive (related to costs incurred, income/household and/or CFUG poverty ranking, etc.) and is realistic (there should be enough revenue left to motivate people to look after their resource).

Timber rents can better contribute to poverty alleviation within CFUGs by developing pro-poor benefit-distribution systems: (i) by giving or selling timber to their poorest members at affordable prices; (ii) by reinvesting timber rents into targeted poverty alleviation activities; and, (iii) by allowing individual CFUG members to share in timber revenues. It is possible that a greater emphasis on maximizing the returns to individual households, and giving them individual freedom to decide how best to use rents from Community Forestry, could go further in alleviating poverty. At the same time, perhaps an emphasis on generating only sufficient group funds to cover management costs and contingencies would enable much more CF income to remain in individual members' pockets.

Therefore, CFUGs should balance internal subsidies and targeted timber sales, while maximizing income from internal and external sales that will enable them to develop a pro-poor livelihood improvement program. The guiding principle or priority (for obtaining a balance) would be to first address "real" local demands for forest products of the poorest to support their livelihoods. Selling surplus on a commercial basis in order to optimize revenues then requires an open and competitive market without restrictions. The use of such revenues must then be prioritized to the poor, either through CFUG-targeted activities, or by redistributing rents amongst individuals. A greater focus on payment to members for participation in CF management activities might raise interest in, and the intensity of, forest management while acting as an improved redistributive mechanism for CF rents and making it easier to determine the true costs of CF management.

The positive aspect of systems such as the DFPSB and CFM is that they allow the targeted distribution of timber outside CFUGs to a larger number of previously excluded people and distant users. However, DFPSB needs reform and boosting, while CFM still needs to be further developed and improved. A common problem with both systems is that it is difficult to avoid the problem of hidden subsidy, as any system that sells below market price to a selected few allows those selected few to capture the difference between the market price and subsidized price. It should also be noted that applying a high and fixed taxation system to CFM is negatively affecting the opportunities to local users and the means to alleviate poverty. It is also unfair as it is much higher than the rate applied to CFUGs. Progressive and conservative taxation should be applied to both CF and CFM, based on productivity and the number of households.

Finally, inadequate attention has been paid to economic issues pertaining to Community Forestry, both in terms of internal CFUG economies, and the broader economy outside CFUGs. It is therefore urged that practitioners and researchers increase their efforts to test some of the ideas presented in this paper.

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