Forest Management and Utilization Under Community Forestry

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Abstract

This paper examines the impact of community forestry on forest resources, based on a study of 11 Forest User Groups (FUGs) in Nepal over three years. The findings confirm that the impact on forest resources has been very positive. Prior to the formation of FUGs, forest resources at almost 75% of study sites were deteriorating, and now all are improving to a greater or lesser extent. However, there is a great complexity of situations on the ground and various weaknesses in the process which need to be addressed, especially forest boundary conflicts, inequity within FUGs due to low participation of poorer households in decision-making, and the prevalence of 'passive' forest management.

INTRODUCTION

This is the third in a series of five papers presenting the findings of a three-year research project (1997-2000) on 'Community Forestry in Nepal: Sustainability and Impacts on Common and Private Property Resource Management'. An overview of the project methodology and study sites is provided in Springate-Baginski *et al*. (2003).

This paper presents the results of the project in relation to the impact of community forestry on forest resources. The first section of the paper focuses on forest composition, and describes how forest resources are managed by the FUGs. The second section discusses the needs of forest users, and the distribution of forest products within communities. The third section concludes with a summary of the policy implications of the findings.

METHODS

The present paper draws on the results of participatory resource mapping and resource assessments carried out in the 11 study FUGs. The 'resource mapping' focused on the characterization of the forest resource, including the spatial breakdown into areas (including formal blocks if the FUG had them), the condition and changes to the condition of the different areas, and the supply and distribution of different products (including who gets what, the rules which govern access and any charges this entails). This process began with a large group meeting, and was developed further through a participatory forest assessment in the forest area itself to produce a resource map.

During the second phase of research a 'resource assessment' was carried out. This began with a discussion of the objectives with FUG committee members and other users, following which a schedule was prepared for the forest inventory process.

- In each forest block of the FUG's community forest, conditions were stratified based on the users' knowledge and field observations (e.g. good, medium and poor condition, as appropriate). Three sample plots were then selected on a random basis to reflect the varying forest conditions present in each block.
- At each sample plot a temporary square sample plot of 100 square meters was selected.
- Stand (trees and shrubs) distribution was counted in each plot according to diameter categories, based on local product use patterns (e.g. *biruwa* (seedling; 0-1.9cm), *langura* (small sapling; 2-6cm), *lathra* (large sapling; 7-10 cm), *ghocha/ghara* (small pole; 11-16 cm) *khanwa* (large pole; 17-25cm), *rukha* (tree; 26-52cm) and *Chhipe ko rukh* (mature tree; >52cm).

FOREST RESOURCES OF THE MIDDLE HILLS

There has been intense debate over the extent of deforestation in the Middle hills of Nepal. Recent studies suggest that the actual extent of forests has not reduced for perhaps a hundred years, although the density has been under pressure (Gilmour and Fisher 1991). The present study found that forest deterioration was a pressing concern to most forest users prior to the introduction of FUGs (over the last decade). However, the situation is highly variable from place to place; in smaller forests under intense use the issue was much more acute than in large forests far from settlements. Users also expressed concern over the availability of þarticular' products (especially Sal – *Shorea robusta*) in 'some' forests, rather than in forests in general. This reflects the fact that Sal forests are particularly vulnerable to over-use, as they provide valuable timber for construction and agricultural implements.

FOREST MANAGEMENT UNDER FUGS

This section considers how forest resources have been affected by community forestry, based on forest users' own indicators of forest management. Forest management is perhaps the fundamental process in community forestry. It is multi-faceted, involving a number of sub-processes:

- forest boundary definition
- forest protection
- forest blocking and development planning
- *godmel* (thinning, pruning, cleaning)
- selective felling
- product harvesting
- product distribution
- collection of dry wood and bedding materials
- intercropping for short-term income generation
- Non-Timber Forest Product (NTFP) production and collection.

Most FUGs in the middle hills have a predominant forest type, the main ones being:

- ***Pine*** (*Pinus roxburghii*): useful for timber, and resin if there is road access. Needles are used in some areas for compost, especially for potato growing.
- ***Sal*** (*Shorea robusta*): excellent timber for construction and agricultural implements. Leaves are used for plate-making.
- ***Katus-Chilaune*** (*Castanopsis sp./ Schima wallichii*): useful for fuel wood, leaf-fodder, and timber.
- ***Utis*** (*Alnus nepalensis*): useful for fuel wood and timber.

The effects of FUG forest management depend on how well it is performed, which in turn depends on the level of development and effectiveness of the FUG institution. Forest management practices of FUGs initially after formation are generally very simple: defining the forest boundary, protection, and perhaps some re-planting. After achieving this and developing cohesion within the group, there can be a gradual progression towards more confident, 'active' management and utilization of the forest (e.g. rotational block-wise management). Table 1 shows the most commonly occurring indicators suggested by forest users to assess different elements of forest management.

Table 1. Indicators for effective forest management suggested by users

Generic process indicators	*Indicators suggested by forest users* *Note: these indicators are not necessarily consensually agreed upon by all users*
Forest boundary defined	• *'Clear boundary line between the forest border and the cultivated land'* • *'Awareness of area of forest'*
Effective forest protection	• *'All the users involved in protection and use of the forest jointly'* • *'Different toles watch the forest near them'* • *'Users patrol forest by rotation: Patrolling users have authority and respect'* • *'Restraint on cutting to preserve the forest'* • *'Fuel wood selling stopped: alternative income generating activities adopted'* • *'No illegal cutting due to effective protection: Big tree stealing ceased'* • *'No illicit product collection by outsiders'* • *'Cattle under controlled / rotational grazing'* • *'Illicit cutting apprehended and punished'* • *'Legal action taken as per rules and regulation against offenders who harm the forest'* • *'Severe punishment for offenders'* • *'No forest fires'*
Forest condition good or improving	• *Green and dense forest with lots of regeneration, producing many useful products'* • *'Forest with different age-group stands, and various species including large mature trees, to keep fulfilling users' needs.'* • *'Lots of grass available in the forest. All open land is covered with plants and grasses.'* • *'Much wildlife'*
Active forest management	• *'The forest is managed properly to maximize its usefulness'* • *'United users are able to make forest management plan and perform the necessary work'* • *'Rotational block wise management system established'* • *'Planting of grasses and saplings, so all open land is covered'* • *'Regular godmel to encourage regeneration of desired species'* • *'Grazing is controlled to allow growth of grasses'* • *'Nursery of desirable species is established'* • *'Plantation of income generating plants in forest like Cardamom* • *'Rational use of forest: extraction and utilization of over-mature trees, deformed trees, and of fallen & dead trees, to yield green fuel wood etc'* • *'FUG permitted to sell surplus timber in bazaar'*

The study strongly confirms that the forest regeneration aspect of community forestry is an unambiguous success. Lack of empirical evidence regarding the state of these forests before the introduction of FUG management means that it is not possible to assess the level to which community forestry alone is responsible for improvements, and this may vary between sites. Nevertheless, prior to the formation of the FUGs, forest resources at almost 75% of study sites were reported to be deteriorating, and now all are improving to a greater or lesser extent; as open grazing, unregulated extraction and illicit felling have been brought under control (as per overall assessment of forest users in group discussions and forest survey). Even where illicit felling continues, it is much reduced and is likely to diminish further. Forest product extraction has become regulated because in general users are treating forest management responsibly. The transfer of control of the forest to the FUG has spread a sense of ownership amongst users; a sense that it is their own, and not the government's. The institution of the FUG provides an effective mechanism through which users can regulate forest use. Forest management has, however, generally remained 'passive', and few of the FUGs have adopted active management regimes.

Challenges of Defining Forest Boundaries

A finding of great concern is that seven of the 11 FUGs studied have not managed to clearly define their actual forest boundaries. This has generally been due to poor hand-over procedures. Users rarely understand 'exactly' what forest they are getting, because Department of Forests (DoF) staff rarely understand the current status of forest boundaries. Experience in the Koshi hills indicates that DoF staff rely on cadastral maps which may be 20 years out of date, and are not easy to interpret in order to apply to the field reality. In all the FUGs visited, the *Range-Post* staff did not update the maps by resurveying the forest at the time of handover (which occurs as a matter of course in some other districts). Furthermore, boundary disputes are generally not addressed at this stage. Pre-existing boundary conflicts and encroachments are passed on from being the District Forest Officer's (DFO) problem to being the FUG's problem, often with little effort on the part of the DoF staff to resolve them.

Another problem arising from poorly identified forest boundaries is that many smaller patches of forest are encroached upon without the FUG's knowledge. Many forests are not contiguous blocks, but include scattered patches. In three FUGs, most users knew the larger patches of community forest, but not the smaller patches adjacent to private land, as they were not clearly defined. In some FUGs, the total area of encroached forest patches can be as much as that of the compact block of community forest. Many users voiced their concerns about this, and wanted to be given the authority to take legal control of these areas. FUGs need to have their role clarified with respect to separate forest patches in their areas, as at present the general perception is that community forestry refers only to the compact, contiguous blocks of forest.

Boundary conflicts are a serious problem for many of the FUGs as they sap the momentum of the FUG. For example, in Helebung FUG where no agreement has been reached with landowners over the actual forest boundary for years, replanting activities in the forest have been suspended. In some cases, DoF staff have created new boundary conflicts at the time of handover. One instance was encountered of *Range-Post* staff handing over a large part of a forest twice, to two adjoining FUGs, as the staff were unclear about what forest had been handed over already.

The cadastral map that is given to the FUG at the time of forest handover is not only out of date, but also often unintelligible to the forest users. There is a need for more user-friendly maps which all members of the FUG can interpret. Enlarged photo-maps have a strong potential here, but even a local sketch-map done on the basis of a field tour would be more useful to users than the current cadastral map.

One possible approach to overcoming boundary conflicts is for the DFO (after appropriate training) to conduct coordinated stakeholder meeting above the FUG level, across a wider area, to clarify the actual forest boundaries between stakeholders.

Systems of Forest Protection

Forest protection and enforcement of rules are key factors in the improvement of forest condition. In the study area there are three types of forest protection systems used by FUGs:

- paid watcher to guard the forest (3 of the 11 FUGs);
- users taking turns to patrol the forest (4 of the 11 FUGs);
- all users watching (but not patrolling) the forest, and reporting rule-breaking to the FUG committee (4 of the 11 FUGs).

Typically FUGs begin with the 'watcher' system (if they can raise the cost of wages) as this is the most effective method for challenging unregulated forest use. As illicit use declines (often through neighboring settlements also forming FUGs) many FUGs then move to 'user turn' systems. Gradually if there is no apparent unregulated use then some FUGs move to the more passive 'user watch' method.

The main role of a watcher is patrolling the forest, supervision of tree marking and product distribution to users, and keeping a record of harvested trees. In eight of the FUGs, protection systems are apparently effective. Illicit felling has largely ceased in all the FUGs studied. In three FUGs protection is only moderately effective, but even here FUG protection activities have reduced illicit extraction and fire damage.

A strong positive indicator of the level of participation in forest protection is that fire damage has, since formation, been minimal in all the FUGs. Previously fire was a major problem leading to loss of forest products such as fuel wood and seedlings. Without collective organization, individuals tended not to put out forest fires. Now the FUGs can respond quickly, and the use of forest watchers provides a better 'early warning system'.

Forest Conditions

One of the key indicators of the success of community forest management is the condition of the forest itself. 'Good or improving forest condition' was one of the most frequently cited process indicators in *tole* (hamlet) meetings. In all the FUGs studied, the forest condition is generally improving, although there is a great complexity of situations on the ground. Many of the users had been very concerned at the deterioration of the forest resources, and they recognize that community forestry has reversed that decline. This finding is a strong endorsement for the entire community forestry process in Nepal. It shows that even though there are many weaknesses in the process, overall the forest resource is undoubtedly improving. This finding concurs with the findings of the Baseline Forest Resources Assessment of NUKCFP (Branney & Yadav 1998), which looked at the same region and found that 'overall indications are that forest condition is improving – particularly in relation to the number and growth of young stems which, if present trends continue, will serve to regenerate the forest.' (p.48). However, there are also concerns about excessive pressure on community forests in certain areas.

The participatory resource assessment of the community forests generated detailed data as to the forest conditions. The quality and quantity of seedlings and saplings affects the sustainability of the forest regeneration. Data from the field survey, as presented in Table 2, indicates that all but one FUG has average or good regeneration in the seedling and/or sapling class. In the case of seedlings, nine of the 11 FUGs studied are in good or average condition. For saplings, eight FUGs have average or good regeneration characteristics. In three FUGs, the sapling regeneration is poor. Only in Helebug FUG is both seedling and sapling regeneration poor, raising some concern for the sustainability of regeneration. A fuller picture of the forest condition in each FUG requires studying the forest data by block, which is beyond the scope of this short paper, although interested readers are referred to Springate-Baginski *et al*. (2001).

Table 2. Status of regeneration (seedling and established sapling) in each community forest.

FUG	Seedling (<4cm diameter) *(no. of Stems/ha)*			Sapling (4-9.9 cm diameter)		
	Good	*Average*	*Poor*	*Good*	*Average*	*Poor*
	>5000	*2000-5000*	*<2000*	*>2000*	*800-2000*	*<800*
Bhaludhunga	5502	-	-	-	1422	-
Jalkini Katlar	-	2408	-	-	-	693
Patle Sanne	11796	-	-	-	-	272
Ramche Sunkhani	7524	-	-	2443	-	-
Dharma Devi	-	-	1354	-	1357	-
Sibhuwa Salghari	6673	-	-	-	1610	-
Ahale	-	4708	-	-	1860	-
Paluwa Pikhuwa	6977	-	-	-	1128	-
Nakla Daskhate	-	3836	-	-	1195	-
Bokre Danda	-	4900	-	-	966	-
Helebung	-	-	1107	-	-	287

How active is Forest Management?

In group discussions users' definitions of 'active forest management' included:

- planning of forest management by forest area or block;
- performing activities specified in a plan consistently over time (e.g. plantation, *godmel* (thinning, pruning and cleaning operations), nursery development, income-generating plantation, and utilizing fallen and over-mature trees).

Immediately after formation most FUGs close their forests for regeneration, particularly if the forests are degraded. Gradually they move towards active forest management. However even then only a small number make the critical step of adopting forest management 'planning' procedures. The move from passive to active management methods happens at different speeds in different FUGs, but from the field study it is clear that only those FUGs which adopt effective planning procedures achieve consistent and effective active forest management. Most FUGs' attempts at active forest management are *ad-hoc* and erratic, and fail to realize the productive potential of the forest.

Of the 11 FUGs studied only three (all with small, compact forests) had adopted active forest management with systematic, time-based, block-wise planning. Active management can be a greater challenge in FUGs with larger forests and membership. The remaining eight FUGs did not have a clear conception of objectives, or a plan for their time bound implementation. As shown in Table 3, there were forest management activities such as *godmel*, plantation, etc., which indicated that these FUGs were moving towards active forest management, but these were poorly planned activities. This does not imply that the activities are always poor and irregular, but the general tendency was towards inconsistency and a lack of strategic direction. FUGs need technical support in developing planning procedures and understanding the potential of active forest management.

Table 3. Users' participation in silvicultural operation and benefit flow

FUGs	Operations Carried out by FUG			Product flow			Users Participation in	
	Thinning, pruning, cleaning (*godmel*)	Selective felling	Plantation	Fuel wood (green)	Timber	Agri-tools	Silvic. Operation	Protection
Bhaludhunga								user watch
Jalkini	√	√		√	√	√	√	user turn
Patle	√	√	√	√	√			watcher
Ramche		√		√	√	√		watcher
Dharma Devi	√	√		√	√		√	watcher
Sibhuwa	√	√		√	√	√	√	watcher
Ahale	√	√	√	√	√		√	user watch
Paluwa Pikhuwa	√	√		√	√		√	user turn
Nakla Daskhate		√		√	√			user turn
Bokre Danda								user watch
Helebung		√		√	√			user watch

A common problem for the FUG committees implementing forest management activities, is difficulty in co-ordinating all the forest users. This can be a result of the committee not having representatives from every *tole* who could co-ordinate the members of their own *tole* more effectively. The more successful FUGs use a system of *tole* representatives or pay poorer users to do the *godmel* work.

There is often a mistaken assumption that community forests are always being managed according to the formally agreed Operational Plans (OPs). Amongst the FUGs studied, this is generally not the case. The specific objectives of the particular FUG's forest management are usually not defined in the OP, which leads to a lack of clarity within the FUG regarding planning and organization of forest

management activities. In most of the FUGs, OPs are not updated and so are not effectively put into practice. Most of the FUGs divided their forests into blocks at the suggestion of the *Range-Post* staff, but very few manage their forests on a block-wise basis. Many FUGs are not even conceptually clear about the purpose of blocking. Due to the lack of active management in most cases, forest resources are under-utilized. Thus FUG forest management activities are much more *ad hoc* than the OP would suggest. A proper planning procedure requires that users' forest needs are assessed, and compared with the forest's potential. These two aspects can then be harmonized into more dynamic forest management plans.

Key Elements of Forest Management

Forest resource assessment and yield regulation. FUGs need to understand and therefore assess their resource status if they are to make realistic plans. Currently FUGs try to control the extraction of forest products, with only a vague idea of the resource condition and productivity. This implies an imbalance leading to either under or over-utilization. The yield regulation recommendations of the DFO staff are of little use as they are based on a vague estimation of resources, and FUGs find them difficult to operationalize, because it is impractical to try to measure all products extracted (e.g. how to monitor the recommendation to harvest 400cft per ha. per year). FUGs need simpler yet also accurate methods to assess forestry resources and extraction, perhaps on the basis of number of stems of different age groups per hectare. If the total number of mature trees is known then annual extraction can be regulated. It may be that FUGs can develop the most appropriate system for themselves. This would be preferable to imposing outside ideas upon them. The need for a participatory resource assessment system which more accurately reflects the needs and abilities of FUG members is currently being addressed by the Inventory Working Group of the Forest Sector Coordination Committee, amongst others.

Blocking. Most FUGs do not perceive the importance of block-wise rotational forest management because there has been no attempt to raise awareness among them. Hence we observed widespread 'passive blocking', i.e. blocks have been divided on paper at the request of the Range-Post, without applying the concept of blocking in forest management practices.

Users' needs assessment. There is no proper users' needs assessment, or understanding of how this might harmonize with forest product potential. For example, in Ramche and Sibhuwa Salghari, *Sal* trees are used for agricultural implements and ordinary wood requirements. By using available alternatives such as *Schima wallichii*, the FUG could preserve the *Sal* to take advantage of its high market price.

Decision-making. The low level of active forest management may also be attributed to decision-making difficulties: many of the FUGs have tended towards the easiest management solution, which is to partially or fully close access to the forest. It appears to be the case that as the FUG gains the confidence of the users over time, more complex activities can be undertaken by consensus.

Technical support. There is little technical support available for those FUGs wishing to improve their forest management. What is needed is planning that combines users' needs with the production possibilities of the forest. The DoF staff have little knowledge or experience of planning forest management for such complex production objectives. Where active forest management is occurring, it has been a learning experience for all involved, and it is this sort of learning which needs 'scaling up' more widely to other FUGs. Detailed OPs need to be prepared through (i) participatory resource assessment, (ii) commonly defined management objectives, and (iii) carefully selected management operations.

Scaling up. The 'scaling-up' of active forest management with technically and socially appropriate resource extraction practices has so far proved very difficult. One approach could be to build on the experience of already successfully active FUGs, by encouraging them to play an extension role to other FUGs. This would also reduce pressure on DFO staff. (The GTZ funded Churia Forest Development Project has in fact initiated a community forestry demonstration program to speed up

this learning process among a select group of FUGs, at the same time ensuring equitable representation of all interest groups in the plan preparation process, with the aim of achieving a 'critical mass' whereby such group-to-group extension could cover the whole project area.)

FOREST PRODUCT DISTRIBUTION

Initially after FUG formation, product extraction is commonly tightly restricted to allow regeneration, especially where the forest is degraded. Users are then obliged to find alternative product supplies, and this affects poor groups the most. As the resource improves over time, product extraction levels can increase, particularly where more active management is adopted. Table 4 shows some of the indicators suggested by forest users for assessing different aspects of product distribution.

Table 4. Forest users' suggested indicators of effective forest product flows

Generic Process Indicator	Actual Users' suggestions
Appropriate forest product needs fulfilled	• *'Forest products available easily at low cost'* • *'Continuous supply of different products to fulfill the different needs of forest user'* • *'Users can take forest products as required without fear of anyone else'* • *'Easy to collect fire wood and other forest products - less time required to collect- more time for farming and other work'*
Equitable product distribution	• *'Separate arrangement of forest product for poor and rich by need-based consideration'* • *'FUG members use the forest jointly, with equitable benefit-sharing'*
Sustainable / Secure product supply	• *'Secure current and future availability of forest products'* • *'There should be various ages of trees and plants, this will keep fulfilling the needs in future'* • *'Environment protected for the future generation'* • *'Forest carefully utilized without waste; e.g. Slanted trees cut where possible, ploughs made from the least possible wood'*

Users' Needs

The pattern of users' product needs and expectations is complex, subject to household livelihood patterns and wealth, forest type and product availability. Depending on the FUG, households use forests for a variety of purposes (Table 5). Different wealth ranks prioritize different products from the forest. For example, poorer households may be more dependent on the forest for fodder, whereas richer households tend to have private sources. Men and women also have different priorities as they have different household responsibilities. Women may be concerned with fuel wood, fodder and leaf litter collection, while men may be more preoccupied with agricultural implements and construction timber.

Table 5. Flow of forest products from FUGs

Sites	Fuel wood	Timber	Poles	Agricul-tural tools	Grass	Leaf-fodder	Grazing	Leaf-litter	Other
Bhaludhunga	*y*	-	-	-	*y*	*y*	-	-	-
Jalkini Katlar	*y*	*y*	*y*	*y*	*y*	*y*	*y*	*y*	Charcoal
Patle Sanne	*y*	*y*	*y*	*y*	*y*	-	*y*	*y*	Resin
Ramche	*y*	*y*	*y*	*y*	*y*	*y*	*y*	*y*	-
Dharma Devi	*y*	*y*	-	-	*y*	-	-	*y*	-
Sibhuwa	*y*	*y*	*y*	*y*	*y*	*y*	*y*	*y*	-
Ahale	*y*	*y*	-	-	*y*	-	-	*y*	-
Paluwa Pikh.	*y*	-	*y*	*y*	*y*	-	-	-	-
Nakla Daskh	*y*	*y*	-	-	*y*	-	-	*y*	Charcoal
Bokre Danda	*y*	-	-	-	*y*	-	-	*y*	-
Helebung	*y*	-	*y*	*y*	*y*	*y*	*y*	*y*	-

Fuel wood

About two-thirds of households depend on fuel wood from the community forest for cooking and heating. Rich and medium wealth ranks tend to supply their needs both from their own farm resources, and by paying royalties to collect quality green fuel wood to store. Poor and landless groups fulfill most of their fuel wood needs by collecting dry and fallen branches, often on a day-to-day basis. The sale of fuel wood is a common practice amongst poor and landless groups living near bazaar (market) areas. This often contravenes FUG regulations. In some FUGs, the rights of poor groups to sell fuel wood has been formalized and they are charged a low rate for the permit. In other FUGs the regulations are often only loosely enforced, where it is recognized that poorer households must sell fuel wood to survive. In a number of FUGs the fact that special provision has not been made to allow fuel wood sale by poorer groups reflects their marginalization from decision-making.

Timber

Sawn timber is a valued forest product, particularly for house construction. Seven of 11 FUGs supply timber to users (those that don't, generally don't have timber in their forest). In six of the seven FUGs distributing timber there was a clear pattern of poorer households receiving less timber than medium and rich wealth ranks. The main cause of this inequity is that royalty charges for timber are often affordable only for wealthier groups. FUGs close to district headquarters were experiencing problems due to demand for timber from the towns. This can result in illicit harvesting, or occasional users pressuring the FUG to distribute timber beyond sustainable levels.

Poles

A pole is an un-sawn or roughly split tree trunk, treetop or branch, used for fencing and house construction. They are very important for poorer groups as they are cheaper than sawn timber. Very few FUG members receive poles since they are considered to be 'poor people's timber', and so, pole distribution is often not considered in FUG decision-making. Only six FUGs are formally distributing poles, and in these, less than half of the 'medium', 'poor' and 'very poor' households are receiving an allocation. Improving pole distribution is an important way to ensure that poorer households benefit from community forestry.

Agriculture Tools

Six FUGs are distributing material for agricultural tools, and all have experienced problems with over-extraction. This is mainly due to the wasteful traditional practice of felling one tree per household, and using only *Sal* timber for making ploughs. Users also tend to select only straight trees, leaving twisted trees, which could also be used for plough blades. Until recently, none of the FUGs had much control over extraction of materials for agricultural tools. Over-felling of *Sal* is gradually becoming recognized as a serious problem in some areas. Some FUGs are realizing the need to improve utilisation practices by using species other than *Sal* where possible (e.g. *Chilaune*), and to utilize each felled tree more effectively by sharing it among a number of households. This issue is

mainly of concern to rich and medium ranking groups, as they have land and oxen for which they need agricultural tools.

Grass and Fodder

As livestock keeping is the second most frequently cited household livelihood activity after agriculture, there is great demand for fodder, which is generally available only in low quantities. Collection of grass and tree fodder is free in all FUGs although grazing of animals is usually prohibited. The opportunity exists to increase fodder supply by planting improved varieties in forest areas.

Leaf-litter

Leaf-litter is collected from the forest floor and used for animal bedding. This is then used as an ingredient in compost making, and spread on the field to increase the nutrient content of soil. Only some forest types are considered suitable for leaf-litter, particularly *Katus-Chilaune* and high altitude broad-leaf forest types. Leaf-litter is being collected in nine FUGs, but generally on a limited basis.

Other Products

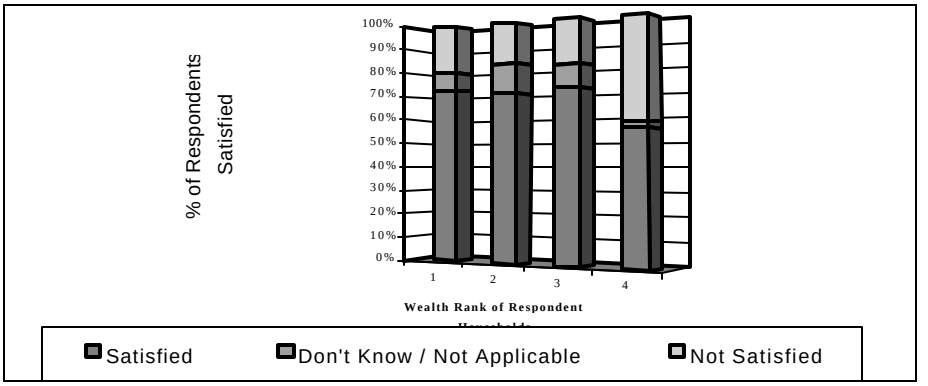
- Two FUGs permit charcoal burning by blacksmiths.
- In one FUG resin collection is highly systematic. When the mature *Chir* pine forest was handed over to the FUG, it was already being tapped for resin. The FUG has continued to develop resin tapping, providing jobs for 22 tapers, and raising over Rs.150, 000 (US$ 1923) per year. Proceeds have been used for various social development projects.
- There is great potential for the collection and cultivation of NTFPs such as berries, fruit (*mel*) and medicinal herbs. Some FUGs have started plantations of the spice cardamom for generating revenue. On the other hand, there has been criticism that intercropping on too wide a scale can cause problems for the forest ecology.

User Satisfaction

Prior to community forestry, most households had been dissatisfied with the lack of effective controls on forest product extraction. Now the majority of households are satisfied with product distribution. In eight of 11 FUGs, users are generally satisfied with the product supply system of their FUG, and are easily able to get the products they need. There is a general sense that forest product supply has improved and is more accessible, and that supply has been ensured for the future. In three FUGs this is not the case, due to the concerns of poorer users. In each of these FUGs the constraint is not the forest, but the management regime; if the FUG were administered more effectively, the restrictions would not be necessary.

Satisfaction levels across the FUGs, compared by wealth rank, are not uniform (Figure 1). There is a satisfaction level of around 70% of rich, medium and poor households with the product distribution regime, but there is a distinctively lower level of satisfaction amongst the (small number of) landless households. This is due to forest product distribution not suiting their needs, and the lack of their participation in decision-making processes. The poorer respondents were particularly dissatisfied due to the inequity of high royalty charges, an elite bias in decision-making, and restrictions on quantity of products distributed or permitted for collection. Some poorer users are concerned they may not have construction timber available in the future if the rich continue to extract it at the present rate. Many of the FUGs adopt a system where all households get a similar quota of forest products. This can be reasonably equitable where all users have similar needs. However, where users' needs are divergent, those with fewer private resources can suffer.

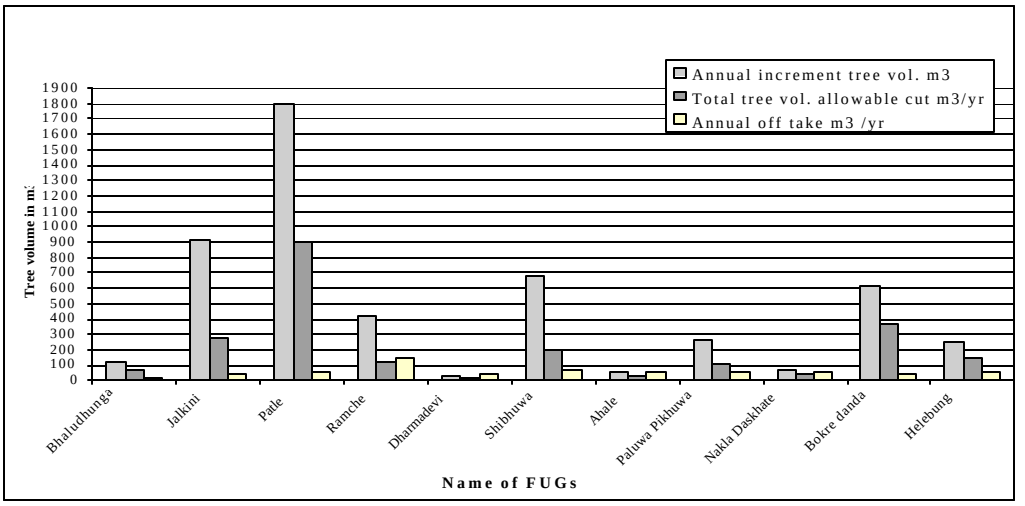
Figure 1. Satisfaction of FUG members with product distribution system, by wealth rank (1=rich, 2=medium, 3=poor, 4=landless)



Sustainable Product Supply

If forest product extraction is to be sustainable, extraction must be below the rate of regeneration of the forest. The conventional method used by the DoF foresters to ensure this, is to calculate the 'annual increment' of the forest stock, and from this calculate a proportion of 'allowable cut'. These figures are based on coarse aggregations across large and diverse forests and can be misleading, firstly because they are based on the assumption that timber and fuel wood are the primary forest products required, and secondly, because this method does not take into account changes in management when an FUG takes over. For instance, when FUGs take on management of a forest, they often choose to fell 'over-mature' trees in order to open the canopy to facilitate regeneration, even though in annual terms they may be exceeding the allowable cut. Furthermore, growing stock calculations exclude saplings (which are prolific in these community forests), which gives a somewhat misleading picture for smaller forests and woodlots.

Figure 2. Annual yield regulation by FUG (1994-1999)



Note: The level of actual forest product off-take is calculated on the basis of product harvested annually from community forest such as timber, fuel wood and agricultural tools. This is averaged over the last five years.

Figure 2 shows that, when averaged over a five-year period (1994-9), only four FUGs extracted more than the allowable cut. From field verification we can say that only in two of these are there concerns over the sustainability of product extraction. Even here, awareness about sustainable practices has been growing. Measures have been introduced to moderate extraction, and in recent years the level is within allowable limits. Table 6 illustrates the trend of trees felled for ploughs and timber at Ramche FUG, where improved utilization practices were introduced.

Table 6. Trend of tree felling in Ramche FUG

Year	1994	1995	1996	1997	1998	1999
Trees felled for ploughs	85	71	65	55	65	26
Trees felled for timber	51 (1275cft)	41 (1025cft)	33 (850cft)	0	43 (1211cft)	13 (310cft)
Total trees felled	136	112	98	55	108	39

In the other two FUGs, Ahale and Dharmadevi, in which annual off-take exceeds the 'allowable cut', utilization is in fact close to optimal, i.e. they have active forest management, careful planning to extract the maximum on a sustainable basis, and regular modifications of their extraction levels according to the availability of products. The majority of fuel wood is gained from thinning and pruning operations, and so is not destructive to the forest.

'Under-utilization' of the forest is evident in seven of the 11 FUGs. Here, product extraction was clearly sustainable over the long term, and forest utilization was generally below full capacity, and well below the 'annual allowable cut'. Where FUGs are not optimizing harvesting operations, this is mainly due to their insufficient technical knowledge and confidence to manage product extraction. An option for improving under-utilization is rotational block-wise operations, but so far these are being practised only in a small number of FUGs.

Finding a fit between the productive capacity of the forest and the needs of users may sometimes be difficult at FUG level – as the ratio of group size to forest size can vary considerably. However there may be better symmetries between needs and forest capacity if the level of analysis is a 'group' of FUGs. Currently this sort of coordinated planning is likely to be beyond FUGs' management capacity, although in the future some system of combined planning and product exchange could prove helpful as long as transaction costs can be minimized.

CONCLUSIONS AND POLICY IMPLICATIONS

We are seeing in Nepal perhaps the furthest progress in the transition in international forestry practice away from government agencies struggling to enforce long-term large-scale blueprint-based OPs, toward a more democratic and consensual model where local stakeholders' planning and capacity building are treated as ongoing processes. The rate of change in the community forestry process in Nepal is in part moderated by the rate at which the government departments themselves are able to keep pace with and support innovations in the field. The current '2nd generation' challenges might be characterized as moving from the model of implementing community forestry on a technical-silvicultural model (focusing on regeneration and conservation but often restricting utilization) – to supporting and facilitating community forest management: through which local people plan for themselves a more active and flexible utilization of the forest resource, based on a more rough and ready rule of thumb approach, in order to serve their wider livelihood objectives.

There has already been great progress, for which all stakeholders' distinctive contributions must be wholeheartedly acknowledged. Many users in this study felt that forest degradation had been reversed, and 'good or improving forest condition' was one of the most frequently cited process indicators in *tole* meetings. This finding is a strong endorsement for the entire community forestry process in Nepal. With such progress new issues and opportunities are apparent.

Promotion of active forest management: Most FUGs are not realizing the full productive potential of their forests due to *ad hoc* and erratic forest management activities. To achieve consistent and effective active forest management, FUGs need technical support in developing and implementing more dynamic planning procedures. In particular, FUGs need help to assess their forestry resources and extraction levels, and reconcile these with actual user needs for specific products.

For FUGs to move toward a more dynamic mode involves not just active forest management but perhaps more importantly a more 'dynamic planning process'. Users need to understand: (i) what resource they have, (ii) what its alternative productive potentials are, and (iii) how best these can be mobilized on an equitable basis according to the needs and wishes of the different forest users. Such a planning process may also give rise to livelihood development initiatives outside of the forest sector, and thereby better link forest management into the local community development context. One possible approach to local management planning is discussed in Dev *et al*. (2003). It is essential that this need for improved FUG planning is recognized as a function separate from DoF monitoring and OP approval: OPs are already often irrelevant to FUGs actual operations. The OP format and revision process must become more flexible in order to reflect users' actual needs and practices, not to continue to obstruct them.

User-friendly 'information tools' are also needed by FUGs to guide active forest management planning (for instance participatory resource assessment methods, and rule of thumb harvesting guidelines).

As DoF field staff are already subject to workloads beyond their capacity, such facilitation support will require complementary support services, whether from Non-governmental Organizations (NGOs), community development organizations, or from FUG networks and Federations such as the Federation of Community Forestry User Groups of Nepal (FECOFUN). It may be that consulting agencies may even emerge to compete in the market to supply this sort of service professionally. But whilst there will always be a need for specialist technical advice in specific cases, similar to the need to consult a doctor periodically, technical guidance should clarify and empower, not mystify and disempower. As with medicine, users can be helped to understand how to manage the 'health' of their resource rather than being perpetually dependent on outside 'experts'.

Increasing satisfaction of the very poor: Product distribution is considered satisfactory by around 70% of rich, medium and poor households, but there is a distinctively lower level of satisfaction amongst the (small number of) landless households. This is due to forest product distribution systems not reflecting their needs, and the lack of their participation in decision-making processes. The promotion of more inclusive decision-making, and more equitable product distribution is essential.

Managing and resolving persistent boundary conflicts: A finding of great concern is that at the time of handover a majority of the FUGs studied were handed forests without clearly defined boundaries, due to boundary conflicts. Conflicts must be addressed as a matter of urgency if FUGs are to resume the initiative. In principle the forestland is government property, yet FUGs are being expected to shoulder the burden of policing that land: management of boundary conflicts between individuals and the government have generally been transferred to FUGs along with the forest itself. So far it seems DFOs have not played a decisive role in dealing with conflict issues, and where courts have been involved they have made flawed decisions in a number of cases. Policy response is urgently required and an assertive DFO role in support of FUGs is the starting point. Multi-stakeholder committees at VDC level or higher may be required to investigate and resolve these issues.

At village level reliance on outdated and un-user-friendly cadastral maps has contributed to the problem, and the use of more user-friendly maps (e.g. photo-maps and sketch maps), which all members of the FUG can interpret would at least increase transparency of the issue. Furthermore, FUGs need to have their role clarified with respect to separate forest patches. At present the general perception is that community forestry refers to compact, contiguous blocks of forest. This can lead to encroachments on community forest patches.

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