**Quantifying the Benefits of Community Forestry in Nepal:
Towards Development of a Participatory Methodology of Economic Valuation**

By

Keshav Kanel
His Majesty's Government of Nepal
G.P.O. 2528, Kathmandu
Nepal
krkanel@infoclub.com.np

George Varughese
United Nations Development Programme
P.O. Box 107, Kathmandu
Nepal
george.varughese@undp.org

1. INTRODUCTION

For over twenty years, a movement has been evolving towards the complete involvement of Community Forest Users Groups (CFUGs) in the management and utilization of forests in the hills of Nepal. In the initial stages, the focus was on participatory environmental conservation through the planting of trees. Later, the emphasis turned to the institutional development of CFUGs so that they could undertake forest management activities themselves and have better control of local resources. The government's forest service would provide a facilitating regime within which these CFUGs could function. The objective of this move towards decentralized local governance in forest management was originally to produce forest products sufficient for the needs of CFUG members. Later, the objective expanded to include the mobilization and empowerment of these CFUGs in the broader development of their local communities (for a recent review, see Chapagain, Kanel, and Regmi, 1999). Now, there is a concern being raised about the equity aspect of forest product distribution among the different stakeholders within a CFUG. Moreover, the question of the role of community forestry in the alleviation of poverty in rural communities is also being raised in Nepal.

In the extant research on forest resources and institutions--foremost among which is the methodology developed by the International Forest Resources and Institutions (IFRI) Research Program at Indiana University--there are ways to gauge the impact of institutional arrangements on local forest condition. The research methodology is able to provide extremely useful, valid and reliable data for the analysis of relationships between forest users and forest conditions (see, for example, Varughese, 1999; Gibson, McKean and Ostrom, 2000). However, there is need to enhance this research methodology to include the equity aspects of forest product utilization, as rural communities begin to go beyond conservation to explore how local collective action for conservation can lead to direct betterment of livelihoods.

Such targeted research can provide otherwise unavailable information for policy makers to assess the distributional impacts of forest product utilization at the local level. With this aim in mind, we have attempted to develop a methodology to measure the costs and benefits of community forest management among different wealth-ranked groups of CFUGs in Nepal. We have attempted to develop a quantitative methodology that is participatory as well: it aims to show the actual returns from community forestry to poorer and richer households within a community.

The objectives of this research are:

(1)   to develop a replicable participatory economic methodology so that CFUG stakeholder groups can calculate the returns to their engagement in community forestry and, thus, gain a tool for improving distributional equity within a CFUG;

(2)   to allow decision makers to better understand the policy implications of the economic impacts of community forestry at the local level.

1

The research was participatory or empowering in the sense that it was not extractive. We conducted our field exercises and calculations with the active involvement of local users so that they could internalize research results and begin to grapple better with equity considerations in their management of community forests.

This paper draws heavily on a report by Richards et al. (1999), which details this methodology and the analysis of the application of this methodology. The lead author of this paper was actively involved in the design and application of this methodology.

2. REVIEW OF THE METHODOLOGY

The study used the following basic methodology (although there were some variations between the CFUGs as the methodology evolved over the course of the study):

1) A general CFUG meeting to explain the objectives, make introductions, etc. At this stage, certain costs common to all stakeholder groups were identified, as royalty payments to the CFUG, other cash costs (e.g., hired labor to saw timber), and the number of obligatory CFUG days per household on such activities as nursery work, vigilance, weeding, and so on.

2) A wealth-ranking exercise dividing the CFUG households into three stakeholder groups using criteria established by the community - usually a combination of food security and landholding. In two out of four cases, this was carried out prior to the study, and in the other two it was carried out as a part of a general CFUG meeting.

3) PRA-type exercises with stakeholder groups representing 'poorer', 'mid-wealth' and 'richer' households. In one case, we separated men and women. These included, in different CFUGs, participatory mapping of forest product flows before and after CF, ranking and scoring of livelihood activities and forest benefits, discussions of the costs or disbenefits of CF, and labour and activity calendars.

4) From each stakeholder group, four key informants were selected through a combination of self-selection and interest shown in the exercise. These key informants, with the help of the facilitators, identified product flows and labor use of each forest product collected - both before and after the advent of CF, but only for one community forest (that of the participating CFUG). This information, particularly extraction levels, was transferred to large sheets of paper. In three of the four CFUGs, a 'barter game' involving trading forest products with well-known cash products (e.g, bags of corn) was carried out in order to establish unit values. Then using large sheets of paper, and a system of stones, the key informant group calculated the gross value of production, costs and gross margin. Pictures and the use of physical objects to represent the products were used as much as possible.

5) A general discussion between the stakeholder groups of the calculations of the key informant groups. In three cases, the research team took the data away to process it on a spreadsheet and then 'gave back' the data in as participatory a way as feasible, and

in one case the whole process took place in one field exercise spread out over two days without computer processing.

6) Processing and analysis of the results for reporting to Nepal-UK Community Forestry Project (NUKCFP).

While this methodology appeared to generate considerable interest, and in at least one CFUG (Patle Panghsingh) subsequent discussions revealed that it was useful in generating discussions about equity, a number of limitations were also revealed. The most serious of these were as follows:

(a)   The amount of time it takes to do a participatory calculation, and the relationship between time and attention or interest levels. Even in the so-called slack season for agriculture, there is always something to do, particularly for women who are the primary forest product collectors. Attention falls as time, and the concern to get on with other tasks, increases.

        Truly participatory approaches are very expensive for local people, even if they are not for researchers. Economic calculations are not as straightforward as some believe, and involve a series of steps that take time. For example, it is not just a case of calculating the average per collecting household; this has to be multiplied by the proportion of collecting households. The calculation of animal grazing days and values is particularly complex. We concluded that two separate half days was the maximum that people could reasonably be expected to give to such an exercise.

(b)   The majority of people were non-numerate or illiterate, and this proportion increased in the poorer stakeholder groups. In spite of the creative use of physical objects, stones, pictures, using fake money, etc., it proved very difficult to maintain the interest of these participants.

(c)   Triangulation revealed that the numbers given by the key informants over-estimated forest product collection significantly. One reason for this is that in a group situation, even when it is quite small, there seems to be a tendency for people not to want to state production or extraction levels below what others have said, and perhaps also a tendency to agree with what the first person said (possibly to get the exercise over with quicker). One of the local support staff mentioned that there was a tendency for the key informants to express their annual collection levels more in terms of what they wanted to consume than what they actually collected.

        The other main worry is how representative four people, selected in a non-random fashion, can be of a larger stakeholder group that almost certainly exhibits considerable heterogeneity in collection levels and even the range of products selected.

3

(d)   The problem of multiple CFUG membership and the interaction of private trees and CF in determining equity. Largely due to the time limitation, only CF was studied - that of the CFUG under study. But CFUG members used several CFs, as well as trees on private land and from national forest areas. Equity in CF product collection needs to be viewed in terms of the dependence of the family on CF, as opposed to other sources of forest products, and in terms of overall use levels and the labor cost of obtaining the required subsistence consumption level of forest products. Any equity indicator needs to take account of labor costs per unit of overall forest product collection, since this incorporates the average distance and time required to collect a given bundle of forest products. The opportunity costs for family welfare (and poverty alleviation) are naturally high for female forest product collection time. This cost falls as the proportion of forest products collected from private forestland rises.

(e)   The high cost of outside facilitation of the participatory calculations. Participatory economic calculations are not as easy as might be supposed and it is not certain that they could be effectively facilitated without serious errors by a forest ranger or equivalent. In the first phase, three economists were present most of the time - one to work with each stakeholder group. There are clearly serious questions of costs and replicability of such a methodology. At the least, the methodology required the supervision of an economist in each CFUG.

(f)   Other commonly encountered problems of participatory work exist; for example, dominant individuals, people dropping in and out, interference by outsiders to the group, and so on.

In sum, the methodology attempted to get answers to the following questions for each stakeholder in a logical way:

1. What and how much is now collected by different stakeholders?
2. What and how much used to be collected before CF?
3. What is it worth? (unit value and gross value of production calculation)
4. What are the cash costs including the depreciation of tools used?
5. How much time does it take to collect the products?
6. What is the return on labour? (gross margin per person day)

3. STUDY SITES AND SELECTED CFUGs

The study was conducted in two administrative districts of eastern Nepal. These districts (Dhankuta and Terhathum) are presently covered under the NUKCFP. Five CFUGs (two of them were combined in one study) were studied over a period of about four and a half weeks split into two stages: 17 January - 2 February; and 22 February - 6 March. Three CFUGs were studied in Dhankuta district and two CFUGs were studied in the neighbouring Tehrathum District.

These four case studies were purposively selected to develop a replicable methodology rather than to be representative samples. The four case studies were:

A. Dumre Sanne CFUG;
B. Mainhakhop Giddyakhop CFUG;
C. Bhaduare and Chuli Dada CFUG (in a combined study); and
D. Patle Pangsing CFUG.

4. RESULTS OF ANALYSIS

The calculation presented here represents a first approximation of the returns to community forestry. A single visit approach relying on 'memory recall', and with a very small 'sample size' is problematic in such types of 'snapshot' studies. Nevertheless, this study attempted to develop a participatory methodology for measuring the equity issues of product distribution obtained from the community forests.

4.1 Average values extracted from the community forests

Table 4.1 presents the gross values of the four community forests in terms of per hectare of forest area and the return per person day and per household.

Table 4.1 Gross values and gross margin of different forests

Community Forests	Gross value per household Nrs.000	Gross value per hectare of forest Nrs.000	Gross margin per person day Nrs
A. Dumre Sanne	10.3	13.2	80
B. Mainhakhop Giddakhop	14.7	3.6	65
C. Bhadure and Chuli Dada	4.5	20.3	80
D. Patle Pangsingh	1.1	4.9	70

The gross value and gross margin differs for different forests, CFUG households and members due mainly to differences in the forest type and use pattern.

4.2 Gross margin per household

Table 4.2 provides information on the gross margin per household for different stakeholders of the same CFUG. It also shows that the poor household benefited the least from these forests.

Table 4.2 Gross margin per household

Community Forests	Poorer group Nrs.000 per hh.	Middle group Nrs.000 per hh.	Richer group Nrs.000 per hh
A. Dumre Sanne	5.7	12.6	8.4
B. Mainhakhop Giddakhop	11.0	12.2	16.4
C. Bhadure and Chuli Dada	3.9	5.2	5.0
D. Patle Pangsingh	0.8	0.6	1.1

Many of the poor households had either negligible area of farm or none at all. Therefore, these households collected very little of some forest products, such as leaf litter or even grass from the forest, which were eventually used as manure on farm. They also had very few livestock to graze in the forest.

4.3 Returns to family labor

Table 4.3 presents the return per person day of family labor including transaction cost days spent on community forest related activities. It also shows the opportunity cost of labor averaged per year.

Table 4.3 Gross margin per person day and the opportunity cost of labor

Community Forests	Poorer group Nrs/day.	Middle group Nrs/day.	Richer group Nrs/day.	Average Opp.cost Nrs/day
A. Dumre Sanne	71	103	65	80
B. Mainhakhop Giddakhop	44	80	74	67
C. Bhadure and Chuli Dada	79	75	84	80
D. Patle Pangsingh	60	68	78	80

The table reveals that returns per labor day were lower for poor households than for the other two categories. This may be due to the fact that livestock grazing was a high labor return activity and the poorer households had fewer livestock.

4.4 Benefit Cost Ratio from Community Forests

Table 4.4 shows the benefit cost ratio for different forests and for different stakeholders. Gross values of various forest products represent the benefit. Cost is calculated as the direct cost of labor involved in the management and extraction of these forest products and valued at its opportunity cost.

Table 4.4 Benefit Cost ratios from Community forests

Community Forests	Poorer group	Middle group	Richer group
A. Dumre Sanne	1.0	1.3	0.8
B. Mainhakhop Giddakhop	0.7	1.2	1.1
C. Bhadure and Chuli Dada	1.0	1.0	1.1
D. Patle Pangsingh	0.8	0.8	1.0

The table indicates that, usually, community forestry activity is not an economically profitable venture. However, some forest services that are highly valued by villagers and rural communities have not been included in these calculations.

4.5 Opportunity Cost of CF: the foregone benefits of national forests

Table 4.5 shows the opportunity cost of community forest for different stakeholders. The table reveals that the pattern is different for different forests.

Table 4.5 Opportunity cost of CF in terms of foregone national forest benefits

Community Forests	Poorer group Nrs.000 per hh.	Middle group Nrs.000 per hh.	Richer group Nrs.000 per hh
A. Dumre Sanne	4.9	10.0	11.2
B. Mainhakhop Giddakhop	8.2	16.4	22.4
C. Bhadure and Chuli Dada	8.1	7.0	6.6
D. Patle Pangsingh	2.6	3.2	0.2

Richer households appear to lose the most for the first two forests. However, the poorer households appeared to lose the most for the last two forests. It has to be understood that the previous open-access scenario was not sustainable, and what the households were saying was <u>their</u> perception of loss rather than the actual loss.

4.6 The net economic gain or loss from CF

Table 4.6 presents the difference in gross margin per household before and after community forest or the 'net equity' effect of community forest.

Table 4.6 Net economic gain or loss from CF

Community Forests	Poorer group Nrs.000 per hh.	Middle group Nrs.000 per hh.	Richer group Nrs.000 per hh
A. Dumre Sanne	0.8	2.5	(2.8)
B. Mainhakhop Giddakhop	2.7	(4.2)	(6.0)
C. Bhadure and Chuli Dada	(4.2)	(1.8)	(1.6)
D. Patle Pangsingh	(1.8)	(2.6)	0.9

The table shows that the foregone benefits from open access forests were stated to be higher than the current sustainable benefits from community forests.

5. CONCLUSIONS

The prime objective of the research was to develop a workable methodology to estimate the equity issues of community forestry in Nepal. The secondary objective was to apply this methodology in actually estimating the equity impact. The participatory fieldwork demonstrated that a methodology was developed which could be used by CFUG committee members to improve their internal rules in allocating the distribution of forestry products. In fact, the CFUG committee of Patle Pangsing discussed the outcome of the analysis in their monthly meeting, and planned to have a further discussion on it in their annual general assembly meeting. However, further refinement of this methodology was considered essential on at least three fronts:

⇒ First, it was realized that the key informants had a general tendency to overestimate the quantity of forest products harvested from community forests. Valuation on non-marketed products such as fodder, leaf litter and grazing is still a difficult part.

⇒ Second, the key informants were selected based on their interest and ability to express their experience. How to select them based on their representativeness is still an issue.

⇒ Third, most of the households are multiple CFUG members. Although we attempted to estimate the total products collected from all of the community forests, our calculation was based on one community forest per CFUG. The team realized that the analysis should be based on the total products derived from all the community forests.

The research methodology was further improved in a follow up study during a three-week period in Nepal in late March/early April 2000. In this follow up study, the team also asked about CFUG members' willingness to pay for non-marketable products. Previously, this was based mainly on 'barter game' findings. Household surveys were undertaken to rectify the second issue. Similarly, the research team included all the forest products collected from all the community forests per household in the second study. The outcome of the second study is in the process of publication.

8

In addition to improvements recorded in this methodology over two iterations, some policy-related observations can be made about the prevailing uses of forest products by the communities who participated in the study. In particular, given the government's current emphasis on poverty reduction as a critical component of natural resource management, the benefits of community forestry can be understood by virtue of their utility to households that have different wealth rankings. With regard to the three main uses—as agriculture and livestock inputs, as construction timber, and as fuelwood—these are as follows:

1) Poorer households, especially those without land, cannot use fodder, leaf litter, and other agricultural inputs, which are benefits enjoyed mainly by better-off households.

2) Timber sold to CFUG members at below-market prices is mostly purchased and used by better-off households, since they have greater demand for it and have the ability to pay. Worse-off households, on the other hand, do not have the need or ability to pay for timber.

3) The use of wood for fuel in the rural household does not exhibit the disparity of benefit seen in the previous two products. That is, all households have a certain demand for fuelwood and, as such, being better or worse-off does not affect the usage at present. This could certainly change if household sizes are drastically different within communities.

Current policy provides for equal access to forest products. However, two out of the three products mentioned above do not lend themselves to equitable use because of disparities of wealth among rural households. The lack of a legal provision to trade or sell unused product cripples the poorest households' ability to realize any income from the harvesting of those two products, which are of little value to them otherwise.

If community forestry is to help reduce poverty, this weakness in policy should be addressed. That is, to go beyond conservation and the provision of basic forest benefits, policy shall have to enable <u>all</u> households to realize the full value of the share of forest products available to them.

REFERENCES

Chapagain, Devendra, P., Kanel, K.R., and Regmi, D.C. 1999. Current Policy and Legal Context of the Forestry Sector with reference to the Community Forestry Programme in Nepal. Working Overview. Kathmandu: Nepal-UK Community Forestry Project.

Gibson, C., McKean, M., and Ostrom, E. (Eds.), 2000. People and Forests: Communities, Institutions, and the Governance of Forests. MIT Press, Cambridge.

Richards M., Kanel K., Maharjan M. and Davis J. 1999. Towards Participatory Economic Analysis by Forest User Groups in Nepal. Overseas Development Institute, London.

Varughese, G., 1999. Villagers, Bureaucrats, and Forests in Nepal: Designing Governance for a Complex Resource. Unpublished Ph.D. diss., Indiana University, Bloomington.