Chapter 1

STUDY OBJECTIVES, METHODOLOGY, AND FRAMEWORK

Objectives

The main objective of the study was to provide a comprehensive evaluation of selected forest user groups (FUGs) with particular reference to their structure, function, and performance. The study of the operational procedures and forest management activities of selected FUGs in Palpa and review of the performance and impact of the Phewa Tal Watershed Development Project's (PTWDP) activities in Kaski were planned in such a way as to emphasise sustainability, equity, and environmental soundness.

The specific objectives in evaluating FUGs in Palpa were as follows.

a) Review of FUGs' structure, function, and sustainability in Palpa with special emphasis on a) the importance of local leadership; b) accessibility to forests; c) effect of socioeconomic fragmentation; d) incentive mechanisms; e) rule-enforcing mechanism; f) role of women in forest management; g) resource availability; h) ethnic composition; and i) the effect on people's knowledge, awareness, attitude, and participation.

b) After discussions with the District Forest Officer of Palpa, the following objectives were added: a) reasons for less disputes; b) staff constraints and increasing demand for handing over forests; c) feasibility of reforestation through UGs; and d) the best way to phase out forest guards.

Among the specific objectives fixed for the evaluation of the Phewa Watershed area were the ones given below.

c)   Review of the watershed, placing special emphasis on a) the nature and approaches of project interventions; b) level of local participation; c) sustainability and replicability factors; d) problems and prospects for the future; and e) changes in people's awareness, knowledge, and attitude.

d)   Based on discussions with the Project Chief, the following objectives were added - a) performance evaluation of UG-based conservation activities; b) the effect of development work, e.g., road construction on lake sedimentation; c) the effect of project termination on watershed management; and d) UG forestry problems resulting from the heavy population and market pressures generated by Pokhara town.

By combining all four sets of objectives, the 'general thrust' of this study was framed. This 'general thrust' provided a direction towards which the evaluation was to be oriented in investigating changes in the biophysical and sociological variables under user group management of forest resources. These variables were then related to the project-led interventions to establish relationships if any and provide explanations. This strategy thus formed a 'framework' for the evaluation study.

Framework for Analysis

The description of the framework provides a detailed specification of the 'general thrust' of the study, including variables and processes used in the evaluation. The 'general thrust' of this study is based on the premise that the current orientation towards community forestry, in the form of user group forestry, can be a positive step towards providing full stewardship of natural resources to the respective communities. However, in order for this approach to be sustainable, there has to be a commensurate improvement in the individual, community, and resource attributes which can be monitored and evaluated easily. The Government should also recognise that the massive task of reforestation and forest management in the country is not possible

without changing the 'incentive' and 'tenure' structures in the natural resources' management system. Therefore, attitudinal changes in the thinking and decision-making processes of the Department of Forests (DOF) officials, as well as those of community dwellers, are needed if a long-term partnership between the two is to be established for better management of forest resources. Ultimately, if a permanent basis for a common property-based, forest resource management system is to be developed, both the community members and government officials have to increase and improve their participation in resource management activities.

The above description of the 'general thrust' of the UG forestry evaluation approach also implies that a well-defined UG, if given written authority to manage forest resources, could contain deforestation and appreciably increase fodder, fuelwood, timber, and leaf litter (FFTL) supplies in the concerned community. The basic premise of this approach is that, since people rely on natural resources' survival for their livelihood, there is a strong incentive to manage these resources sustainably.

Primacy of Socioeconomic Variables

Since FUGs in Palpa and Phewa have been organised primarily to improve the supplies of FFTL in order to meet the growing demand of users, and some time is required to make these forest products available in the required quantities, the performance of user groups cannot be evaluated in terms of physical parameters alone, at least, not for the present. Therefore, this study assumed that the real benefits or strengths of UGF could be better measured through people's knowledge, awareness, participation, attitudes, skills, and perceptions which, in summary, will hereafter be referred to as socio-psychological variables (PSVs). In the evaluation, an attempt has been made to measure the respective project's impact on the production and supply of 'basic forestry goods' (BFGs), including environmental services, wherever information was available.

Conceptual Basis of Research

The relatively new community forestry strategy, popularly called user group forestry (UGF), was evolved mainly to address the problem of people's reluctance to accept the responsibility of forest

management in their respective communities. The main reason for the failure of conventional community forestry (CF) was identified as the users' perception of "no change" in land and tree tenure structure in their favour. Therefore, the UGF approach attempts to demonstrate in writing the willingness of the Government to reverse the tenure system by handing over the task of forest management to a well-defined and formal UG (owner), accompanied by an officially approved document called the operational plan (OP). It is expected that, through this demonstration process, UGF will radically improve people's social awareness and skill levels, besides increasing the production and supply of BFGs and ensuring sustainable forest management in the mid-hills of Nepal.

Measured Variables

The evaluation study considered altogether thirteen 'causal factors' and 'indicators' as independent variables and 'effect' and 'impact' factors as dependent variables (Table 1). Some of the important causal factors were 1) exposure to UGF rules and regulations; 2) incentive mechanisms in forestry; 3) ethnic composition; 4) disputes related to rights' violation and trespassing rules; 5) participation in training and observation tours; 6) participation in FUG-sponsored activities; 7) steps followed in developing an operational plan; 8) the role of local leadership, etc.

Similarly the indicator variables were 1) gender; 2) education; 3) occupation; 4) ethnic/caste group; 5) age; 6) family size; 7) landholding; 8) livestock holding; 9) occupation, etc.

Key Factors and Indicators

The causal factors were measured through sample survey-based, personal interview schedules. The indicators were measured by discussing the basic socioeconomic characteristics with the respondents of the two study areas. The effect and impact factors were measured by questioning the respondents about their knowledge, awareness, participation, attitude, practice, and perception of the ongoing community forestry programmes in Palpa and the watershed management programmes in the Phewa Watershed.

The 'awareness' questions dealt with five separate issues - 1) District Forest Office or project functions; 2) recent government policies on UG forestry; 3) project objectives; 4) project implementing agencies; and 5) key personnel of the agencies. The 'knowledge' questions dealt with FUG formation, forest management, afforestation techniques, preferred species, lopping and thinning methods, protection systems, harvesting and distribution mechanisms, etc.

Effects and Impacts

The four effects were comprised of an increased level of - 1) knowledge, 2) awareness, 3) attitude, and 4) participation. The two impact variables were 1) improved forestry practices/skills and 2) improved perceptions of both the UG members and professional staff. Attitude was measured by asking the respondents how they felt towards 1) the project; 2) the two implementing agencies (i.e., District Forest Office, Palpa and Phewa Watershed Management Office, Pokhara); 3) the project personnel; 4) the handing over process; 5) the monitoring and extension methods employed; 6) and the structure, function, and effectiveness of the FUG committees.

Participation was determined by asking the respondents if, how, and when they had participated in DFO/PTWDP organised training, observation visits, reforestation programmes, nursery development activities, and FUG seminars. Practice was measured by asking the respondents about their fuelwood, fodder, timber, pole, leaf litter, fruit and twig use pattern.

Finally, impact was determined by asking the respondents about their perception of the demand and supply of FFTL in the past, at present, and in the future.

Project Inputs

The important components of the systems that were facilitated through project inputs (funded through the Palpa Development Project and the Phewa Tal Watershed Development Project or PDP and PTWDP respectively) were 1) handing over the forests to the UGs; 2) reforestation of degraded areas; 3) information and extension; 4) training; 5) improved cooking stove distribution; and 6) technical and office support. Although the goals of the two

projects were different, the basic assumptions were identical in that the supply of forestry products (FFTL) could be increased through combined resource development and participatory community management activities consisting of 1) increasing the number of trees planted under agroforestry and community forestry programmes; 2) improving directly the technical and motivational skills of the project staff through training; 3) increasing people's participation through improved dissemination of information and extension; 4) increasing the forest area handed over to the UGs for management; 5) reducing fuelwood consumption and promoting its conservation; and 6) improving monitoring and evaluation of the project activities. These activities were evaluated through the measurement of several key factors and key indicators as given in Table 1.

Data Collection Methods

There were two dimensions to the information collected for this study. First of all, the 'intent' dimension of data collection was descriptive, comparative, and predictive. Secondly, the 'time' dimension of the information collected referred to the past, present, and future. In order to accommodate these two dimensions, four different data collection methods were employed to gather socioeconomic and biophysical data. Biostock information was collected by using Rapid Vegetation Assessment (RVA) techniques. A description of the methods is given below.

Historical Survey

Participatory Rural Appraisal (PRA) methods, particularly participatory mapping, historical transacts, trend lines, and time line diagrams were drawn to depict and understand the pattern of historical changes, their spatial distribution, and major impacts thereof. In-depth interviews with community members and local forestry field staff enabled the team to reconstruct the changes in forest use and management over the past 30 to 50 years. The FUG level information sheet guided the team in developing an overview and a semi-structured interview schedule was followed.

Sample Survey

The main purpose of this survey was to collect demographic, sociological, and economic information at the household level.

Table 1:   Key Factors and Key Indicators Used in the Evaluation Method

KEY FACTORS	KEY INDICATORS
PALPA:	
a. local leadership and user group identification	Attributes of the elected/selected leader, caste, education, age, occupation, party affiliation, service experiences, etc
b. accessibility to forests	No. of days the forest is opened for fuelwood, fodder, leaf litter collection
c. effect of socioeconomic fragmentation	Number of labourers contributed by rich/poor for protection
d. incentive mechanism	Type of benefit-sharing mechanism; privileges and penalties
e. mechanism of enforcing the rules	Penalties imposed on first/second/third time offenders
f. role of women in forest management	Number of women members in FUG/committee, women's preference, tasks, perception, attitude, knowledge, practice, etc
g. resource availability and utilisation patterns (dry as well as green products)	Current biostock/projected growth and yield in cu.m.; sustained yield in terms of year-wise biomass (tonnes) supply
h. ethnic composition	Ethnic composition of the members/committees/village
i. effect on people's knowledge, awareness, attitude, and participation	Number and type of forest/trees/FUG rules, project objectives and activities, feeling towards DOF/FUG personnel, extent of people's participation
j. reasons for less disputes and equity	Number of disputes before and after FUG mgmt., who gets what?
k. staff constraints and increasing demand for handing over forests	Work hours before and after FUG implementation, staff availability, time required to plan and monitor FUG activities
l. afforestation activities through UGs	Cost of afforestation through Government/FUG; survival counts, etc
m. the best way to phase out forest guards	Steps to be followed in removal of forest guards, time taken to plan local community protection measures, time required for FUG form action.
PHEWA:	
a. nature and approaches of project interventions	List of project inputs/outputs/activities and their extent
b. level of local participation	Number of HH participating, duration of participation, age, sex, and occupation of participator, activities
c. sustainability and replicability factors	Trends in the biophysical resource situation, social institution characteristics of watersheds to be replicated
d. problems and prospects for the future, needs/attitude/perception	Type of additional support needed, past experience, and future ideas,
e. change in people's awareness, knowledge, and attitude	Ideas about new projects, forest, soil conservation, etc, project objectives/outputs of the project
f. performance evaluation of UG based conservation activities	Outputs and effectiveness of the project activities, people's attitude towards and perception of project outputs
g. effect of road construction on lake sedimentation	Sedimentation rate of different road construction methods, length of road, and trend of sedimentation into the lake
h. effect of project termination on watershed management	Date of termination, Govt.'s plan for the future, anticipated effects on sedimentation, erosion, etc
i. UG forestry problems due to the heavy population and market pressure generated by Pokhara town	Type/source/extent of problems; nature of damage caused by the attitude of the people participating in destructive activities; and their perception of UG managed forests

Source: Study Team

Although no pre-project baseline survey data existed, a post-project baseline sample survey was used to collect information on the following categories: 1) demography; 2) land tenure and land use systems; 3) social organisation; 4) cultural attributes; and 5) incentive structures. The instrument used was close-ended and semi-structured, and pre-testing was carried out in the two study areas prior to administration. This information was compared with the small sample, pre-project surveys and case studies' database.

Rapid Vegetation Assessment (RVA)

This method is based on Rapid Rural Appraisal (RRA) techniques (Chambers 1991 and Nurse et al. 1992). RVA can be described as a method of collecting information on trees and other vegetation in order to analyse resource availability and resource conditions. The following method was used in both Palpa and Pokhara to prepare an inventory of tree vegetation and to assess the stock as well as project the future products.

Resource Availability Appraisal. This method consists of listing all the forest patches existing within the Village Development Committee and selecting the one managed by the study user group to prepare an intensive inventory. A sketch map of the forest was prepared and located on the base map of the village. The map was prepared by using the following procedure: first, the team drew ridge lines and drainage lines. Then roads, walking tracks, and locations of settlement houses and temples were added. Using this information, a preliminary land use map showing the forest boundary, forest type, agricultural land, grazing land, and settlements was prepared.

A combination of standard mensuration techniques and ecological assessment methods was used to assess the status of forest vegetation and its dynamics. The methods used differed from the conventional techniques, especially in terms of approach, timeline, and audience. These methods specifically aimed at generating a simple and rapid assessment of vegetation conditions, growth behaviour, and their potential in natural forests and shrub land. Rapid vegetation appraisal was carried out using rapid measurement and evaluation techniques (Nurse et al. 1992). Before field measurements were taken, discussions were held with both the UG members and DFO staff regarding forest

management conditions and problems. Resource persons were selected from among the UG members (village consultants) to participate in the team and they helped to identify appropriate study locations. The assessment attempts to reflect the impacts of existing forest use systems, protection interventions, and vegetation growth patterns.

Sample Plot/Quadrate. Sample plots were selected using two to three 10 metre radius (.05ha) randomly-selected plots and two to three 10 x 10 metre quadrants. After marking the plots and quadrate, species composition, stocking, and growth data were collected. Species' frequency was recorded for all sizes of plots falling inside the quadrate. However, diameter at breast height was recorded for saplings recording a DBH of 2.5cm and above only. Circular plots with a 10m radius or measuring 500sq.m in area were used due to its minimum error potential. The number of quadrants depends on the vegetation composition, condition, and distribution. For example, for each sub-type of forest (sal, chilaune, and salla), one quadrate was selected. The research team was interested in both the quality and stock of resources. Statistically, even a small number of quadrates can provide a good and accurate estimate if sampled properly. Therefore, replications of quadrates were carried out to capture variations in soil type, altitude, and topography.

Measurement Techniques. Trees were measured for trunk size (DBH), density of regeneration growth, and species' composition to estimate the standing biomass and productivity. This information was essential to the understanding of sustainability of biomass removal, spatial and temporal decisions regarding extraction, and possible mode of utilisation. Data on the standing biomass, productivity, and stump density were used to assess forest productivity. Shrubs and smaller trees with a DBH less than 2.5cm were not counted. Since the current tree density is directly correlated to the potential biomass production in the future, the assessment of regenera-ting seedlings is expected to facilitate decisions regarding the projected quantities of biomass removal for different uses at different time intervals.

Biomass Estimation. The standing biomass or biomass productivity of trees is the most important parameter for making management decisions regarding the quantity of sustainable tree biomass extraction. Biomass here refers to the wood and foliage

weight or volume of trees (including stems and branches) at a given (standing), or over a period of, time (productivity) in a prescribed area. Biomass was estimated using DBH and height which are indicators of tree volume or weight also. Several studies (Vega Condori 1985; Mohns *et al.* 1988; and Karki 1992) have established a quantitative relationship between the weight of certain trees and their DBH and height for Nepal's mid-hills.

Projection Techniques

Based on the data collected from primary and secondary sources, regression and extrapolation techniques were used to project the future biostock growth and yield, product demands, and cost and price indicators. Except for certain modifications in the phrasing of interview questions, schedules for gathering data in the Palpa and Phewa areas made use of the same questionnaire and checklist. Close-ended questions were asked in sample surveys and open-ended questionnaire schedules were used in Rapid Appraisal surveys.

Women's Role in UG Forestry

General Approach of the Study

In each of the seven FUGs, the study attempted to find out why and how women were participating in the FUG activities. The following key points were specifically focussed on during investigation.

*   Find out whether the inclusion of women in the user group committee (UGC) represents the genuine interest and purpose of the women members or were they there simply to fulfill the quota.
*   Study the structure of committees to find out specifically which women were included in the committee and understand the operational plan formulation, committee formation, and plan implementation processes.
*   Identify key areas of FUG functioning in which the women's role is indispensable, and analyse how this has been captured.
*   Determine the perception and attitude of male members of the UGC towards women.

*   Develop a strategy based on the findings of the study to effectively improve and expand the role of women in FUG-based forest management activities.

*   Analyse comparatively the benefits received by women and their responsibilities in UG-managed forests.

Method of the Study

Women members of the UGC were interviewed separately as the key informants. Although the methods adopted were used to study both the process and results of women's involvement in UGF, most of the information gathered was related to the process. General women users were visited in their homes, fields, and forests. The PRA team involved in exercises aimed at carrying out a general evaluation of FUG activities included women also. Women sociologists identified the following key points for investigation.

1.   At what point in the UG formation process - user identification, conflict resolution, membership finalisation, operational plan development, etc, were women included?
2.   How influential were women's opinions in committee formation?
3.   How were women's problems and expectations accommodated in the operational plan?
4.   How was the composition of the committee determined?
5.   What attributes of women qualify them to be members of the executive committee?
6.   Were women members in the committee elected democratically by women only or selected by the male elite?
7.   How did women function within the UG committee? Was participation active or passive?
8.   How effective did women members feel their role was in the FUG committee?
9.   How did the general users, especially women, feel about the process, functioning, and effectiveness of women's involvement in the UGC ?
10.   Which section of women (caste, ethnicity, economy, and geographic location) generally participated in FUG activities?

11.   What were the motivating factors for women's participation and continued functioning?

12.   What were the constraints to continuing/improving their functioning and effectiveness experienced by women?

13.   What was the future outlook for women's involvement and how can women's participation in UGF be increased?

14.   Did women receive benefits in proportion to their participation and contribution?

Research Team

An interdisciplinary research team, consisting of one Forest Resources' Management Specialist, one Social Forestry Specialist, one Silviculturist, one Human Resource Management Specialist, and one Sociologist (a woman), conducted this study. The expert services of several professional foresters, soil conservation specialists, and IOF lecturers were used also. The data collection team consisted of four B.Sc. forestry students.

Forest User Groups under Study

At the beginning of this study, altogether 25 forests had been handed over to recognised user groups by the DFO, Palpa, and four in the Phewa Watershed by the DFO, Kaski. In Palpa, 20 were purely natural growth forests (secondary growth forest) and five were partly or fully reforested (Annex, Table 1). The average area of forests in Palpa was around 35ha and most of them were handed over during the two years from 1990 to 1992. In Phewa, out of the four forests handed over, one was a plantation forest and the others were predominantly natural. The average forest size was 35ha and all of them were handed over in 1991. The forest user groups were selected for detailed evaluation based on the following criteria:

a)   the forest should be in the production stage;

b)   the forest should be representative of forests among the 'handed over' forests;

c)   the forest should be representative of both successes and failures in user group management and,

d)   if possible, both natural and planted forests should be selected.

User Group Selection

Seven forest user groups (FUGs) in Palpa and two in Phewa were
selected for detailed investigation. In Palpa, the average size of
forests was 41.8ha and the average size of FUG membership was
151. On an average, each member of the household had access to
about 0.3ha of forest land. Six forests were natural and one was
a mixture of plantation and natural stands. Three forests were
formally handed over in 1990 whereas two each were handed over
in 1991 and 1992. In Phewa, the average forest area and UG size
were 26.5ha and 114 respectively. All the four forests were handed
over in 1991. One of the selected forests was a plantation and the
other was a secondary growth forest.

Key Questions for User Group Evaluation

The following sample key questions were used to evaluate the
performance of user groups in Palpa and Phewa. A close-ended,
structured questionnaire was used for formal surveys. An open-
ended questionnaire and a checklist were used for rapid surveys.

a.   UG identification - whether the membership criteria were
      defined properly or not?
b.   Protection - whether a system of regular forest protection
      and compliance with the rules existed or not?
c.   Reforestation - whether forest development activities as
      specified in the operational plan were conducted and/or
      whether or not FUGs were formed primarily for the
      purpose of sustainable reforestation or not?
d.   Distribution and Utilisation - whether products were
      harvested, distributed, and utilised fairly, appropriately,
      and efficiently or not?
e.   Management - whether products, both dry and green, were
      removed as per the prescribed silviculture treatments or
      not?
f.   Decision-making - whether the decision-making power was
      decentralised and executed democratically or not?
g.   Conflicts - whether conflicts, both inter-group and intra-
      group, existed which hampered the smooth
      implementation of the operational plans (OPs) or not?
h.   Equity - whether all sections of the community, both the
      present and future generations, had equal opportunities to
      benefit from the UG forests or not?

i.   Gender and Class - whether the interests and needs of the weaker of the two genders, landless class, and occupation groups were addressed properly or not?

j.   Externalities - whether forest management has been possible at the cost of other common/national forests or not?

k.   Social/Environmental Benefits - whether people are adequately aware of the non-traditional values of forests such as maintaining the environmental quality, watershed protection, biodiversity, recreation, and aesthetics and have plans to exploit them in future?

Assessment of Sustainability

In the context of this study, the sustainability aspect was examined, based on the concept of sustainable growth and removal. According to this approach, emphasis was laid on the need for continued growth in resource productivity while maintaining the quality of forest resources. In community forestry, this view implied using forest resources at a rate less than the rate at which they can be regenerated continuously. Sustainable community forestry, therefore, must involve successful management of forest resources to satisfy changing agricultural and human needs while maintaining or enhancing the quality of the environment and conserving village forest resources. A simple demand and supply projection of the most basic need of the people, fuelwood, was prepared to indicate the sustainability of resource production and consumption under development practices.

Methods of Measuring Sustainability

Sustainability was assessed, based on the evaluation of biophysical, socioeconomical, and institutional attributes of the forests, user groups, and community respectively. The role of exogenous variables, such as marketing, tree and land tenure, incentive structures, etc, were considered also. Some of the key factors and indicators are described in Table 2.

Many data collection methods were employed to capture these dimensions of the forest management practices of FUGs.

**Table 2:   Factors and Indicators Used in Measuring
Sustainable Forest User Groups**

KEY FACTORS	KEY INDICATORS
1. Facilities of the UG	- Existence of a formal organisational infrastructure (e.g., an office)
2. Trained Manpower	- Number of members trained in forestry
3. Number of Committees	- Executive Committee - Secretariat Committee - Disciplinary Committee - Advisory Committee
4. Good Leadership	- Regular attendance at meetings - High frequency of meetings with visitors - Few or no complaints of unfairness - Good relationships with the DFO staff
5. User Group Income	- Evidence of bank account - Fair amount of deposits in the savings' account - Increasing trend in income received
6. Indigenous Management	- Existence of indigenous system - User group formation based on IM structure
7. Equity	- Fair system of products' distribution - Negligible number of disputes - No free-riding attempts by members
8. Participation	- High degree of participation in UG-sponsored activities by men and women - Regular attendance at UG/UGC meetings
9. Systems and Procedures	- Availability of meeting minutes and visitors' book - Availability of operational plan - List of UG members and committee members - A system of receiving and briefing visitors by UG members
10. Tenure	- Satisfactory tree tenure arrangements; legal codes and security provisions
11. Optimum Biomass Growth and Yield	- Optimally-managed forest resources with the potential of yielding an optimum biomass output for perpetuity
12. Other Development Activities	- Simultaneous occurrence of supportive development activities