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Contribution of Community Forestry to Rural Households: An Economic Analysis

**A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of
Master in Forest Science (Mountain Forestry)**

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**Dedicated to my beloved parents,
Mr. Lila D. Baral and Mrs. Sunmaya Baral,
for their love and encouragement for my every decision**

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Abstract

Community Forestry is an institutional approach for providing rural households and communities with various forest products and for sustaining of rural livelihoods as well as for poverty abatement. This study investigates the benefit sharing mechanisms at the example of two Community Forest User Groups (CFUGs) and quantifies the direct economic contribution of community forestry to the users' households.

Empirical data of the case studies were collected from Kalobhir and Bhitripakha CFUGs which are located in the Dolakha district in Nepal. Free listing, household surveys, group interviews, key informant interviews were the main methods applied in the investigation. Altogether, 115 households were surveyed. Four economic classes (very poor, poor, medium and rich) were identified by means of participatory well-being ranking. Lorenz curves and Gini-coefficients were used to characterize the distribution of the household income with and without the contribution of Community Forest (CF).

The poor users are the main beneficiaries of community forestry in spite of the fact, that they have less access to influence in decision-making processes. It is also found that the poor are extracting more commercial forest products whereas the interest of the rich and mediums is mostly limited to in-house consumption and subsistence uses of forest products. Consequently, especially poor households are relying on income provided by CF which amounts to one-third of the poor's total income. The higher the household income, the lower is the dependency on CF. In both CFUGs, CF contributes to reducing the inequality of household income among the different economic classes. Further studies investigating on indirect benefits and multiplier effects of CF as well as respective impacts on rural livelihoods and poverty alleviation are suggested.

Key words: Community Forest, Forest Products, Preference, Participation, Household Income, Nepal

Zusammenfassung

Die gemeinschaftliche Waldbewirtschaftung (Community Forestry) ist ein institutioneller Ansatz zur Versorgung ländlicher Haushalte und Gemeinschaften mit verschiedenen Forstprodukten, um den Lebensunterhalt der ländlichen Bevölkerung nachhaltig zu sichern und zur Linderung der Armut beizutragen. Am Beispiel zweier Gemeinschaften ('Community Forest User Groups – CFUGs') untersucht die Arbeit die Mechanismen der Nutzenverteilung zwischen verschiedenen ökonomischen Klassen und quantifiziert den jeweiligen, direkten Beitrag von Gemeinschaftsforstwirtschaft zum Lebensunterhalt.

Die empirischen Daten für die Fallstudien wurden in den CFUGs 'Kalobhir' und 'Bhitteripakha' (Nepal) erhoben. Bei der Datenerfassung kamen verschiedene sozialwissenschaftliche Methoden wie insbesondere Haushaltsbefragungen, Gruppen- und Experteninterviews zum Einsatz. Insgesamt wurden 115 Haushalte erhoben. Die Verteilung der Haushaltseinkommen in der Gemeinschaft mit bzw. ohne des Beitrags aus Gemeinschaftswald (CF) wurde mittels Lorenzkurven und Gini-Koeffizienten dargestellt.

Obwohl die ärmeren Mitglieder weniger Einfluss auf die Entscheidungen der Gemeinschaft nehmen können, sind es doch gerade sie, die besonders von Gemeinschaftsforstwirtschaft profitieren. Im Unterschied zu den reicheren Mitgliedern, für die der eigene Naturalbedarf im Vordergrund steht, nutzen in erster Linie die Armen auch kommerziell verwertbare Forstprodukte. In der Folge spielt CF vor allem für die ärmeren Haushalte eine wichtige Rolle. In beiden Gemeinschaften trägt CF dazu bei, die Einkommensunterschiede zwischen den wirtschaftlichen Klassen zu mildern. Um ein noch umfassenderes Bild von der Bedeutung der gemeinschaftlichen Waldbewirtschaftung für den Lebensunterhalt in ländlichen Regionen und die Armutsbekämpfung zu erhalten, werden weitere Studien, die auch die indirekten Nutzenkomponenten sowie Multiplikatoreffekte thematisieren, vorgeschlagen.

Schlüsselwörter: Gemeinschaftswald, Forstprodukte, Präferenzen, Partizipation, Haushaltseinkommen, Nepal

Abbreviations

ANSAB	Asia Network for Sustainable Agriculture and Bioresources
BCR	Benefit Cost Ratio
CBFE	Community Based Forest Enterprise
CBO	Community Based Organization
CBS	Central Bureau of Statistics
CF	Community Forest
CFD	Community Forestry Division
CFUG	Community Forest Users Group
DDC	District Development Committee
DFO	District Forest Office®
DoF	Department of Forest
DSCO	District Soil Conservation Office
EOCF	Enterprise Oriented Community Forest
FECOFUN	Federation of Community Forest Users, Nepal
FSC	Forest Stewardship Council
GA	General Assembly
GD	Group Discussion
Ha	Hectare
HDI	Human Development Index
HHs	Households
HMG	His Majesty's Government
HMGN	His Majesty's Government of Nepal
IGA	Income Generating Activities
INGO	International Non Governmental Organization
LFP	Livelihood and Forestry Programme
LPG	Liquified Petroleum Gas
MAPs	Medicinal and Aromatic Plants
MFSC	Ministry of Forests and Soil Conservation
MPFS	Master Plan for the Forestry Sector
NGO	Non Governmental Organization
NPC	National Planning Commission
NSCFP	Nepal Swiss Community Forestry Project
NTFPs	Non-timber Forest Products
OP	Operational Plan (of CFUG)
NRs	Nepalese Currency (Rupees)
SP	Service Provider
Sps	Species
SPSS	Statistical Package for Social Survey

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Chapter 1: Introduction

1.1 Background

Nepal is a mountainous country, lies between China and India. The total area of the country is 14.7 million hectares with the population of 23 million and 2.2 percent annual growth (CBS, 2001). Administratively, the country is divided into five development regions, fourteen zones, and seventy-five districts. Out of total population, 44 percent live in mid hill whereas more than 85% live in the rural areas (CBS, 2002). Approximately 29% of the land is covered by forest, 10.6% by shrub and 12% by grassland (HMG, 1999).

People and forests in Nepal have existed interdependent relationships for many years. The economy of Nepal largely depends on the use of its natural resource, and is dominated by the agrarian sector (CBS, 2001 cited in Acharya, 2002). Dependency of rural population on forest is high for fuelwood, timber and fodder. Forest accounts 85% of the total energy consumption by the residence sector in the country (CBS, 2002). The rural people also have been involved in the collection, or harvesting, processing and marketing of different forest product since ancient times.

Among different forest types; National Forest, Religious forest, Private Forest, Community Forest (CF) and Leasehold Forest, community forestry is the most prioritized program of Nepal's forestry sector and is focused on fulfilling the basic forestry needs of local people with their active participation in conservation, management and utilization of forest products (MPFS, 1989). The potential area of CF in Nepal is 3561600 hectares, which is 61% of the total national forests (MPFS, 1989). 129272 ha of forest have been handed over to 14,337 Community Forestry User Groups (CFUGs), benefiting 1647717 households, which is about 25 % of the total potential CF area of Nepal (CFD, 2007).

Community forestry has been implemented in Nepal for almost 30 years and is spread throughout the nation. At the initial stage, its focus was on conservation of forest by people participation. The principle aim of community forestry was to fulfill the basic needs of local people Later the objective of community forestry expanded towards empowerment and mobilization of the user groups towards development of the rural community and poverty alleviation by sustainable utilization of forest resources. The key issue today is how to support CFUGs in moving from protection and limited utilization to

active management of their forest resources to fulfill the dual objectives of community forestry, forest conservation and increased flow of benefits to the community (Brown et al., 2002).

Forests can form an important safety net for the very poor in times of hardship as it can help rural households to diversify their livelihood base and reduce their exposure to risk (Arnold, 2001). Application of pro-poor focused 'livelihoods approach' to examine and understand individual or household economics and the ways in which poor groups of people are able to improve their standards of living, has emphasized the fact that natural resources are only one set of capital assets available to, and used by the poor as part of their livelihood strategies (Scoones, 1998; Carney, 1999; Farrington et al., 1999). Since the community forestry is a participatory development program, it could be able to provide a lot of opportunities to the rural poor for their poverty reduction (Niraula, 2004).

CFUGs are legally authorized body to take management decisions (Acharya 2002) and distribute the forest products (FPs) according to operational plan (OP). Kanel and Niraula (2004) from the elaborated data of the study of 1788 CFUGs of Nepal, reported that a variety of FPs is collected, used or sold by CFUGs and generate fund, which is spent mainly on forest and community development activities. Furthermore, they reported that the FPs are the major source of CFUG's income, which contribute around 83% of the total income (i.e. income from FPs plus other sources). CFUGs are spending this income in forest protection and management, community development works, operation of CFUG, pro-poor programmes, capacity building programs like trainings, study tours, and miscellaneous.

Timber, fuelwood, fodder, grasses, leaf-litter and many other NTFPs are the direct benefits for users. CFUGs are very heterogeneous in their make-up, and are reflected in their FP use patterns (Malla, et al., 2003). Different economic class users have their own preference on forest products. Community forestry can play a significant role in reducing the rural poverty if the marginalized groups are treated equitably in terms of access to forest resources (Niraula, 2004). All users' should agree on distribution system of the products, without this support of the majority of users, which is the foundation of protection and control, will be lost and management system will break down (Thompson, 1990). However, there are only limited data related to equity-based distribution of forest products to different groups of people (Verma, 1988). According to Timilsina and Luitel

(2003) the approaches of natural resource management must be devised to allocate more resources to disadvantaged groups so as to make the system, as a whole, more fair. According to Pokharel et al., (2006) local (usually poor) peoples primarily benefit from forest-based enterprises through employment. Therefore, interventions, which seek equity and social justice, should devise ways to give marginalized groups more benefits to poor.

Different economic classes have different preference on forest Products (FPs). Generally rich prefers more valuable forest product such as timber whereas poor prefers subsistence and commercial forest products as they have limited source of income (Paudel, 2003). Regarding participation, mostly rich dominate the decision-making forum whereas poor are mostly involved in labor work in CF (Gauli, 2003; Uprety, 2005).

In this context, the purpose study aim to study the users' preference on FPs, their participation in decision making and the inter-relationship between inputs of CF in household income. Further, there is a need for research that explores the contribution of forest in poverty alleviation. Hence this study will examine the users' preference on FPs, their economic value, users' participation in decision-making, benefit sharing mechanism and contribution of CF in household income.

1.2 Problem statement and justification

The poverty in the third world's countries is endemic and Nepal is not also far from it. The HMG/N (2002) statistics shows that about 44% people are under the poverty line. Forest is an integral part of the daily lives of the rural population of Nepal (Pokharel, 2001). Given is the fact, Master Plan for the Forestry Sectors (MPFS) 1989 has prioritized community forestry to meet the basic needs of rural people. Community forestry due to its role of supplying household demands of various forest products, is widely accepted as a means of livelihoods of the rural people in Nepal. After the successful implementation of almost three decades with the major focus on conservation, most of the CFs is now in the stage of production of sufficient quantities of valuable forest products, i.e., fuelwood, timber and NTFPs. With the advancement of community forestry, it has been increasingly realised as an attainable mechanism that can contribute to reduce poverts in Nepal (Gentle, 2000; NPC, 2002; and Kanel, 2004).

In recent years, the discourse in community forestry in Nepal has changed; sustainable livelihoods and social issues have been fitted into current policies, and poverty reduction is an emerging issue in relation to forest policies. Ninth and Tenth Five-Year Plan (1997-

2002, 2002-2007) and Forestry Sector Policy 2000 have given importance to community forestry as a tool for poverty alleviation. In a due course of time of three decades, community forestry is able to conserve the forest resource whereas its equitable benefit distribution is still a prominent issue with regards to the poorer people of the community who are also the stewards of the common pool natural resources. There are two schools of thoughts about community forestry regarding poverty alleviation. Several studies have mentioned the poor are deprived of getting benefit from community forestry (Pokhrel and Nurse, 2004; Banjade et al., 2006; Uprety 2006), it has limited the access to the poor as the decision-making forum is dominated by elites whereas similar other studies have mentioned its positive contribution on poverty alleviation (Bartlett and Malla, 1992; Sharma, 1992; Chetri and Pandey, 1994; Dahal, 1994; Khanal, 2001). There is growing concern about whether forest resources are acting as safety nets (Byron and Arnold, 1999; Wunder, 2001; Ghimire, 2007) or poverty trap.

Although, the community forestry is successful programme in Nepal, there is still various emerging issues related to marginalized people in the community. In this context, it is necessary to have in-depth economic analysis of total forest benefit. Overall economic analysis of CF will only reveals its actual contribution in household income and hence poverty alleviation. This study will do economic evaluation of both commercial and subsistence forest products along with tangible indirect benefits users getting through different CF related activities. For this, study is conducted in the Dolakha district; taking two enterprises oriented CFUGs having some economic activities.

Furthermore, this study is envisaged to serve as an initiation of the actual economic analysis of the major forest product's use. The findings would be useful in developing new strategies/ concept to involve the poor and very poor users at the centre of the community forestry programme. The data obtained and analyzed will not only be useful for the CFUGs themselves but also for the policy makers, forestry professionals, planners, I/NGOs, CBOs to consider the pro-poor approach.

1.3 Research Objectives

The general objective of this research is to develop a clear understanding about the economic contribution of CFs with respect to the income obtained from it and its contribution to rural household income. The specific objectives are as follows:

1. To know the preference of forest products for different economic classes.
2. To assess the benefit sharing mechanism in community forest users groups (CFUGs) concerning direct and indirect (tangible) benefit.
3. To analyze the economic contribution of community forest in household income among different socio-economic groups.

Research Questions

The following research questions are formulated to fulfill the objectives;

Objective 1: To know the relative preference of FPs for different economic classes

- i. What are the major FPs and their preference among economic classes?
- ii. What is the economic value/market value of the major forest products?
- iii. Why there is different in preference on forest products among different economic classes?

Objective 2: To assess the benefit sharing mechanism in CFUGs concerning direct and indirect (tangible) benefit

- i. What is the participation of different economic classes in decision making process?
- ii. What are the benefit sharing mechanisms with in CFUGs?
- iii. Which economic class is more benefited from CF and why?
- iv. What is the cost benefit ratio of forest management for different classes?

Objective 3: To analyze the economic contribution of CF in household income among different socio-economic groups

- i. What is the level of dependency of different economic groups in CF?
- ii. Does income from CF has equalizing effects in the household income of the users?

Hypothesis

- 1 The preference of FPs doesn't differ among economic classes.
- 2 There is no significant difference in the share of CF benefit among different economic classes.
- 3 There is no significant difference on total forest income among different socio-economic groups.

1.4 Definitions of some key terms/concepts used

Community Forest: Community Forests (CF) are national forests handed over to the local user groups for protection, management and utilization according to the Forest Act, 1993 and Forest Regulation 1995 (Kanel, 2006). According to the act, Community Forest Users Groups (CFUGs) have to be established and registered at the District Forest Office (DFO) before handing over of the forests and they are self-sustained institutions.

Forest Products: For the purpose of this study, only tangible forest goods will be considered as forest products. This will include timber, fuel wood, fodder, bedding material, NTFPs etc but final selection of the forest products will be done after free listing and ranking with users.

Poor: are those people who are landless or having small piece of land, less on-farm activities, low-income level, highly vulnerable, largely depend on community source, agriculture output hardly meets food security for three months.

Very poor: are those people who are landless or having small piece of land, some are diable, old and income level is very low so they are vulnerable people.

Poverty: The World Bank report goes beyond the view of income levels in its definition of poverty, suggesting that poverty includes powerlessness, voicelessness, vulnerability and fear. (Harris, 2004)

Participation: According Arnstein (1969) adopted by Uprety (2003) mention that there are three major type of participation in the community such as citizen power, tokenism and non participation. In this study also three level of participation were adopted in terms of planning, decision- making and implementation of activities regarding community forest management.

Attitude: Kretch (1962), indicate that the social actions of the individual reflect his attitudes, which are the enduring systems of positive or negative evaluations, emotional feelings, and action tendencies with respect to social objects.

Non- timber forest products (NTFPs): NTFPs include all goods of biological origin, as well as services derived from forest or any land under similar use, and exclude wood in all its forms. These include plants and plant materials used for food, fuel, storage and fodder, medicine, cottage and wrapping materials, biochemicals, as well as animals, birds, reptiles and fishes, for food and feather ([FAO, 1992 cited in Odebode, 2005](#)). In the study, NTFPs include all the plant products of biological origin other than timber, fuelwood, leaf litter and fodder.

Benefit sharing: It means the distribution of the outputs from Community Forestry to the legitimate users ([Upreti, 2006](#)).

Economic benefits: is the benefit both direct (cash and subsistence) as well as the indirect tangible benefit from the indirect sources like income generation activities.

Livelihood: According to [Frank \(2000\)](#) defined the livelihood comprises assets (natural, physical, human, financial and social capital), the activities and access to these (mediated by institution and social relation) that together determine the living gained by individual or household. In this research, only social capital and financial capital will be study according to the nature and context of research.

Enterprise Oriented Community Forest (EOCF): Enterprise oriented community forestry in this study is CF which is not only using its forest products as subsistence use rather getting cash by commercializing its products. Further, it can be more explained as CF selling its products in raw or semi or fully processed form establishing enterprise. Expanding the property rights of local communities over resources and empowering them with knowledge, information, technologies, and required skills for forest management and institution building are basic building blocks for the enterprise oriented community forestry ([Subedi, et al., 2004](#)).

Service Providers: According to [Paudel \(2007\)](#) service provider are the DFO, local NGO, FECOFUN who provide service to the CFUG. For this study, service providers are those working in this area for direct financial support or any technical and other institutional support. They might be government organization or non government organization. They are for the welfare of the local people.

1.5 Organisation of the thesis

This thesis comprises the following six chapters – Introduction, Literature review, Materials and Methods, Results, Discussion and Conclusions and Recommendations. The *first chapter* introduces a general background on CF, forest product use, followed by the problem statement and justification which highlights the understanding of present context of the participation of the users in the management and economic activities as well as the benefit sharing from the CF in different level which help to equalize the income distribution. This leads to objectives of the research that formulate research questions. *Chapter two* includes literatures review relating to development of CF, participation and decision-making in community forest activities, role of CF for poverty alleviation, income generation and employment creation, benefits from CF. In addition to this conceptual framework of the study was developed from the literature review which presented *Chapter three* consists of the approaches applied in this research and a flow chart is included to explain briefly the overall research process from proposal preparation to thesis development. Furthermore, description of study area, criteria for selecting study site. It elaborates the outline of the methodological choices and the tools used to collect data from the field and processes followed to analyze them were presented. *Chapter four* presents the results of this study and tried to answer the research questions. *Chapter five* discusses the major findings in the connection to the existing research so far done earlier. *Chapter six* summarises the main empirical and theoretical findings from the result and discussions which help to draw the conclusions and suggested some recommendations to the CFUGs and other relevants stakeholders for dealing with the problem related to equity distribution of the forest income. Finally, the literature cited during the research period, the questionnaire and checklist used for this research were attached in the annexes at the end of this thesis.

Chapter 2: Literature Review

In this chapter, literature related to development of community forestry, participation and decision-making in community forest activities, role of CF for poverty alleviation, income generation and employment creation, benefits from CF are presented in details.

2.1 Community Forestry

Community forestry started in the late 1970s, when the development strategies of the 1950s and 1960s that focused on industrial development were being criticized for overlooking rural development and not meeting the basic needs of the rural poor (Warner, 1997). The basis for what is now, the national community forestry program, was formally launched in Nepal in 1978. This initial attempt took the form of entrusting the resources to the community through the local political body called the Panchayat and Panchayat protected forest (Shrestha, 1996). Following more than twenty-five years of implementation experiences, the program now represents arguably the most advanced and progressive model worldwide for the participatory management of natural resources (Nurse et al., 2004 cited in Pokhrel and Nurse, 2004). Community forestry is defined as a situation, which intimately involves local people in forestry activities (FAO, 1978). As Gilmour and Fisher (1991) defined community forestry in terms of control and management of forest resources by the rural people who use them especially for domestic purposes and as an integral part of their farming systems.

Traditionally, the people of Nepal are dependent on forests for supply of fuelwood, fodder, timber and NTFP. Due to minimum destruction as well as less population pressures, FPs was sufficient for local people. Due to increased human and livestock population and the effects of government policies on land registration resulted in the gradual depletion of forest resources (Pandit and Thapa, 2004). In Nepal, developing effective management of natural resources without involving the people is almost impossible, only success when people and local authorities are empowered and involved (Belbase and Regmi, 2002).

CFUG is the independent autonomous institution. It has to be formed democratically and registered at the DFO with its constitution that defines the rights of the users to a particular forest (HMG, 1993). Where the ownership of the land remains with the

government, management and control of resources on the land belong to CFUG with government officials acting only as extension agents (Pardo, 1993). The DFOs regard the handing over of forests as their primary responsibility, and to their credit, manage to turn over remarkable acreage of forests to communities despite severe staffing shortages (Varughese, 1999). Based on the Forest Act of 1993, under 'Provisions Relating to Community Forests' the CFUGs are 'entitled to develop, conserve, use and manage such forest and sell & distribute the forest products independently fixing their prices, according to an operational plan'. During the last 28 years of CF, nearly 1.2 million ha have been handed over to more than 14,337 CFUGs (CFD, 2007).

2.2 Participation and decision-making in community forest activities

Participation is the key element of the good governance. Gauli (2003) mentioned participation includes three aspects of CF activities; decision-making, benefit sharing and labour works. Cohen and Uphoff (1977) defined participation as involvement of the people in the decision-making process, implementing programs, and sharing benefit of development programs and their involvement in efforts to evaluate such programs. Paudel and Weber (1993) used expected benefits, scope and capacity to examine the factors affecting participation in different sector development and one of them was forestry. It revealed that participation intensity primarily relates to distinct features of works and stages of planning process.

Furthermore, people's participation means that the target beneficiaries participate in all stages of the development process: decision-making for planning, in the process of implementation, in benefits sharing, and monitoring and evaluation (Bhusal, 2001). Local people participation in forest management has found its strongest expression in the promotion of community forestry around the world (Brown et al., 2005). It mainly denotes the voice of all users in decision-making, either directly or through legitimate intermediate institutions that represent their interest (UNDP, 1997).

However, participation depends upon many socio-economic factors as Nepal's social structure is still based on a caste-system, gender, age and wealth with prevalent discrimination. Poor households do not benefit from community forests as much as affluent households because of product distribution decision by influential groups of people and also the opportunity cost of participation, which often yields disinterest in participation (Maskey et al., 2003).

Community forestry aims to alleviate poverty, for that reason there should be more representation of poor people and women in executive committees so that their access to resources will increase. Poor and very poor people are the neediest people involved in the collection and utilization of the forest product for their daily needs but ironically for poor's it is very difficult to participate in the formal meeting (Malla et al., 2003). The poorest are the ones who suffer the most because, firstly, they cannot afford to participate. Secondly, if they do, they hardly speak. If they do speak, they are rarely heard, can hardly get decisions made in their favor. If heard, very few decisions are implemented and if implemented, only few benefit (Pokhrel and Nurse, 2004). Therefore the criterion of 'authentic participation' and indispensable role in the pursuit of equitable benefit sharing is still questionable (Nightingale, 2002). Therefore, poor households do not benefit from community forests as much as affluent households and are not very interested in community participation (Agrawal, 2000). Equal participation is necessary to create effective and equitable management for collective decision-making, which ensures equal benefits for all user groups. However, there are some examples, coming out of darkness, according to (Sharma, 2002) there was no caste and wealth discrimination within the distribution of forest products and that the benefit from the community forests was equally distributed to all user groups.

2.3 Role of Community Forestry for poverty alleviation

Important progress has been made in overall living standard in the world. Despite such developments, the poverty in the world is accelerating specially in the third world countries. According to World Bank (2001), more than one third people are living in extreme poverty, earning less than US\$1 a day, in the world and majority of which falls in third world countries. This indicates that poverty alleviation is serious challenge for beginning of the 21st century.

Poverty is the shortage of minimum food and shelter necessary to maintain life. According to Lipton and Ravillion (1993), poverty is the lack of command over commodities needed for the fulfillment of basic needs. Thus, poverty is the absolute deprivation in the space of commodities or resources. According to Rahman and Hossain (1995) Cited in Paudel (2003) "poverty is not only the state of deprivation. It is equally importantly also a state of vulnerability, powerlessness, physical weakness, isolation and income poverty". A great majority of the population lives in the villages and a big

segment of this rural population are poor. It has been learnt from the series of development efforts conducted by HMG/N that participation of poor people themselves is very important in every program, which aims at poverty alleviation.

Advocates of community-based management argue that community forestry offers the best prospect for the inclusion of the poor and marginalized in Nepalese society along with a method of promoting sustainable management of the nation's forest. The main vision of the community forestry is to create employment and income generation activities for disadvantaged groups and people living below the poverty line ([Acharya et al., 1999](#)). Though it is not clear to what extent the forest products harvested from the community forest contribute to overall household economy ([Baginski et al., 2003](#)). The poor usually derive a greater share of their overall needs from forest products and activities than the wealthier ([Arnold and Townson, 1998](#)).

Dependency of poor on CF for their subsistence needs is higher than that of other groups ([Hobley 1987; Pandey 1999](#)) but [Gentle \(2000\)](#), found that community forestry program is widening the gap between the poor and rich people involved in management of community forest. In Nepalese community forestry, there is reduced access to forest products and some poor households are facing significant problems in meeting their needs ([Pokharel and Nurse, 2004, Baginski et al., 2003](#)). [Kanel \(2004\)](#) suggests that community forestry can make a significant contribution to poverty alleviation, but that the critical issues of forest sector governance and sustainable community forest resource management need to be addressed to do this. Where forest products do become available from community forests, they may not necessarily be those products which are most needed by the poor, or may not be equitably distributed within the FUG ([Timsina, 2002 and Neupane, 2003](#)).

The 4th National Workshop on community forestry (2004) recommended to allocate at least 25% of CFUG fund for pro-poor activities, legal provisions for allocating community forest land to the poor, capacity building program for the poor and disadvantaged, develop effective forest land use planning which addresses land allocation to poor under CF and leasehold forestry, social mobilization to sensitize the elites and others about pro-poor issues, plan livelihoods improvement programs based on wealth ranking of CFUG members and promote pro-poor research and training ([DoF, 2004](#)).

2.4 Income generation and employment creation

Creating sufficient economic incentives to the communities for sustainable use and conservation of natural resources and equitable benefit sharing is not straightforward and simple. CF is important sources of products for domestic consumption and for generation of cash income by people living in and around them. Recently, a number of interventions have been promoted on the basis of the theory that generation of income from forests can provide a positive incentive for sustainable use and contribute to conservation (Fisher, 2000) and in turn, contribute to poverty reduction.

FUGs are permitted to conduct many forest based Income Generation Activities (IGAs) as permitted by the Forest Law 1993 and Forest Regulation 1995 for example, Agroforestry practices like Cardamom (*Amomum sobulatum*), Ginger (*Zingiber officinale*) Broom grass (*Thyosonalaena maxima*), collection and selling of NTFPS so on. In addition to this off forest income generations opportunities like livestock farming, vegetable and fruit production, sericulture, apiculture etc. can be done to improve their social and economic status. In addition, the tenth five years plan (2002-2007) also focuses on this concern and emphasizes on income generation through wise use of natural resources.

Yadav (1998) reported that CFUG has started income generation activities. Although the number of income generating activities is increasing, there is still a lack of sufficient information about all the potential sustainable activities that could be undertaken to improve cash income of community forest users (Shrestha et al., 2001). Potential income generating activities need to be included in forest operational plans. Income generated from sale of the forest products is becoming popular and major incentive for forest conservation and source of rural development (Karki et al., 1994)

For the poor to be benefited from approach and especially pro-poor initiatives are required. A conceptual framework developed by the Swiss-funded NSCFP for a pro-poor approach is very useful which focus on very poor with following the several principle of poverty alleviation (Pokharel and Nurse, 2004). Similarly, Asia Network of Agriculture and Bioresources (ANSAB) is supporting in sub-group formation, land allocation and identifying the appropriate natural products to develop community based enterprise (Subedi et al., 2002).

A study conducted by [Sharma \(2000\)](#) found that community forest income contributes 12 and 3 percent of farm household income of poor and rich households respectively. He further stated that CF slightly reduces rich-poor gap. It has also furnished a good source of income in the group fund.

Recently, there are few documented cases of CFUGs generating income from non-timber forest products. Nevertheless, the interest is increasing ([Drona, 1994](#)). Forest based income is a major contribution to the livelihoods of rural people. CFUGs are operating the forest based micro enterprises. Income generation (IG) from forest products like timber, bamboo, medicinal plant, forest nursery, NTFPs is started. Potentiality of broom grass, cardamom, turmeric, and ginger in forests as a means of IG are explored, incorporated in operational plans and started to implement by some CFUGs ([Upreti, 2000](#)). According to [Edwards \(1993\)](#), CF does not cater to income generating activities through NTFPs.

In many developing countries, a large number of jobs are provided by forests from forest based activities are taken into account. Most of the related activities are labour intensive, maintaining rural employment opportunities and diversifying local economies ([Theophile, 1996](#)). According to [Soudan and Zingari \(2000\)](#) the forests are direct and indirect sources of highly diversified activities. These activities provide local employment opportunities that significantly mitigate the impacts of depopulation and the permanent migration of younger generations. Currently it is estimated that the equivalent of 45 million full time jobs exists worldwide in forestry, related industries and the informal sectors. Of these 6% are in forestry and 36% are in the forest-based informal sector in developing countries ([Soudan and Zingeri, 2000 after Poschen, 1997](#)).

2.5 Benefits from Community Forestry

Several studies have illustrate that CFUGs have been established as a grass root level institution for managing forest resources in order to improve livelihoods of forest users of Nepal ([Malla, 2001](#); [Acharya, 2002](#); [Adhikari et al., 2004](#)). However, many believe that community forest management is protection-oriented where the main forest management activities are limited to the removal of dead and dying trees, and leaf litters. As a consequence, the users are getting sub-optimal benefits ([Gilmour and Fisher, 1991](#); [Chhetri and Pandey, 1992](#); [Karki et al., 1994](#), [Branney, 1996](#); [1998](#); and [Shrestha et al., 2001](#)).

Several studies have been conducted on various dimensions of CF that are mainly focused on social and policy aspects. In many cases CFUGs have become the vehicle for rural development and at present CFUGs are the main democratically elected local institutions. For many poor rural people, CFUGs also act as rural banks and source of revenue and income (Acharya and Oli, 2004; Pokharel et al., 2006). According to Pokharel et al. (2006) mentioned CFUG as vehicle for rural development due to; it manage their finances and give loans to villagers, it support their members for income generating activities such as vegetation farming, livestock, horticulture, fishery and bee keeping. In addition, it contributes to the construction and maintenance of physical infrastructure such as irrigation canals, drinking water schemes, community buildings, wooden bridges, etc. Moreover CFUGs invest in scholarships for poor children, teachers' salaries, school buildings and furniture and established forest based enterprises.

According to Kanel and Kandel (2004) conflict arises in determining the criteria of benefit sharing from CFs. Some argue that the criteria should be made based on family size and some say on the basis of household (Shrestha, 1995). Benefit sharing criteria are not well defined in the OP of many CFUGs. The heterogeneity of households within CFUGs is rarely if ever reflected in the way CFUGs manage their community forest resources and distribute forest products. Wealthier households tend to benefit most from the *status quo*, and since it is these same households who dominate the decision-making processes and assimilate most information about CF through organized events, they have very little incentive to alter anything or to change any of the rules governing the way the CFUG operates. Therefore, although certain actions are required to make sure that poorer households benefit more from CF, it seems unlikely that these actions will be initiated by the elites who dominate CFUG committees (Malla et al., 2003).

Forests provide many different economic benefits, both tangible and intangible. Richards et al. (2003) grouped the benefits into direct and indirect uses, option and non-use values. Use values arise from using the resource in some way, while non-use values do not depend on using the forest. Benefits received directly by forest users and other stakeholder groups are direct use values, and it is divided into extractive uses and non-extractive uses. In more common terms, the CF value of Nepal comprises the direct use value of forest products, the watershed function of the forest including soil and water conservation, eco-tourism, bio-diversity and carbon-storage (Niraula, 2004).

As per [Adhikari \(2004\)](#) the study carried out in eight forest user groups in Kavrepalanchok and Sindhupalchok districts, household use CF for a variety of purposes. Benefits from forest products include firewood, tree fodder, cut grass, leaf-litter, medicinal herbs and timber. To determine if there are differential benefits to diverse socio-economic groups, Adhikari calculated the value of forest products to different economic groups. He used numerous valuation techniques such to estimate the cash value of forest products. [Richards et al. \(2003\)](#) carried out gross margin analysis of CF in the Koshi Hills of Nepal. Estimates were made of expected returns to each of four wealth ranked groups in order to assess how the benefits of CF were distributed. Participatory valuation methodology has been attempted to measure costs and benefits of community forest management among different wealth-ranked groups of CFUGs in Nepal and also show the actual returns from CF to poorer and richer households within a community ([Kanel and Varughese, 2000](#)).

[Bhattarai and Ojha \(2000\)](#) stated in their study that the practices of forest management, poor users are not actually benefiting when all opportunity costs are accounted for the assessment of cost and benefit. Rather, community forestry may be imposing extra costs due to the increased transaction costs of participating in meeting and assemblies and costs of collecting products. [Malla \(2001\)](#) conducted an empirical study in four CFUGs in Koshi hills to find out the causes behind inequity. Whereas, [Khanal \(2001\)](#) concluded from his study that the poor people are getting more benefits from CF programme compared to the rich.

2.6 Conceptual framework of the study

Forest Products (FPs) can bring changes in economic condition of the communities. CFUG is itself the heterogenous group of different classes and caste people in which all are using the same common pool resource for different purposes. The socio-economic factors of the community influence the participation level in decision-making process of CFUG which inturn reflect on benefit sharing from CFUG. Economic benefit will help to change the household income level of the users. Decision-making process and benefit what users get from CF is responsible for shaping their attitude towards CF management. Participation and benefit from CF are interrelated. Users' participation increases as benefit increased and vice versa. Service providers have crucial role to increase participation level of lower economic class users and can facilitate in benefi sharing mechanism of CFUG.

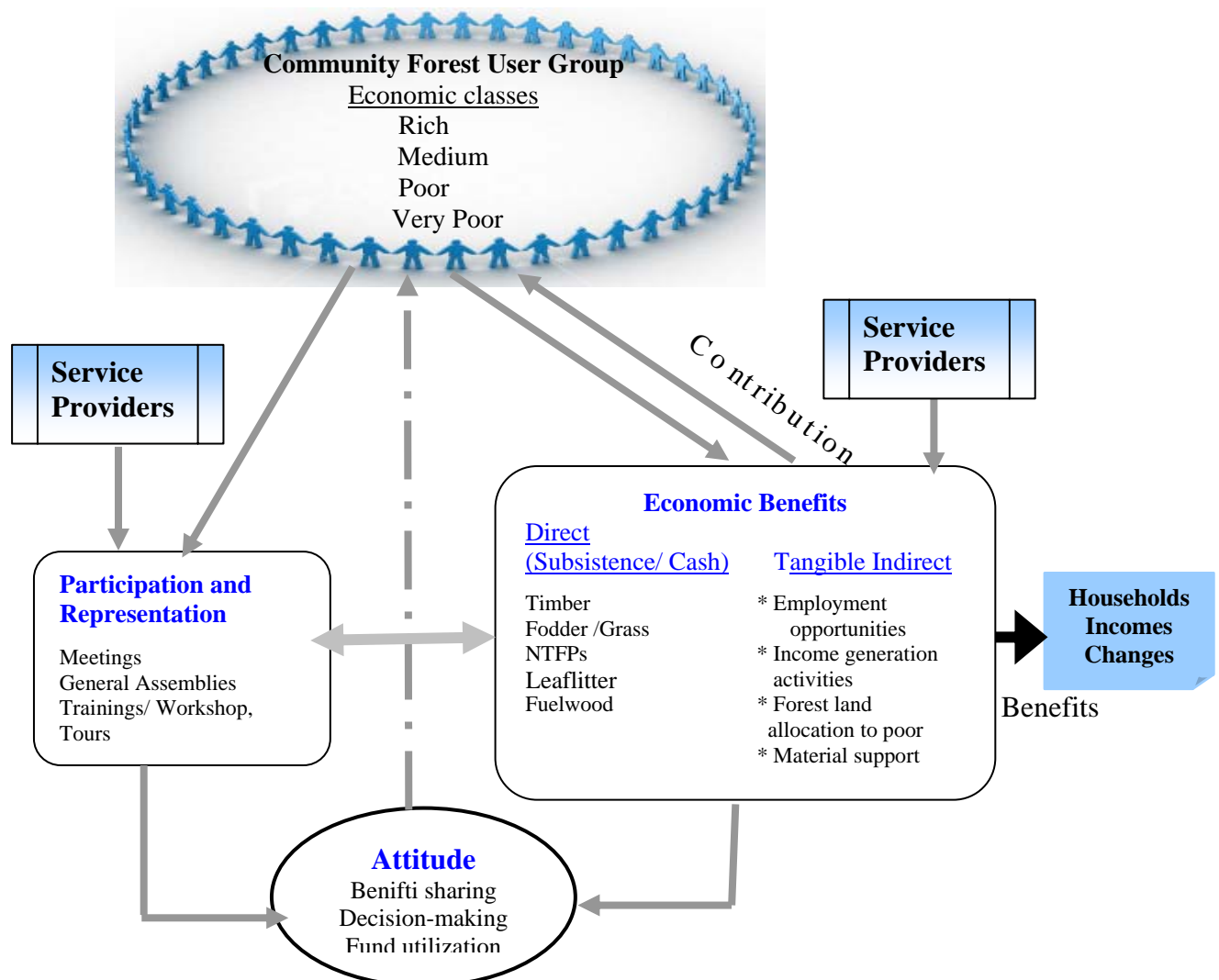


Figure 1: Conceptual framework of the study

Chapter 3: Materials and Methods

An overall outline of this chapter is on the methods and procedures employed by the researcher in this research. It includes the research approach, study area, sampling methods to select sampled CFUGs and households (HHs), research tools used to collect data, and organization of the data and their analysis.

3.1. Research approach

This is an applied and evaluative type of research. It addresses the evaluation of economic contribution of major forest products on the livelihood of poor and also attempts to explore the direct and indirect (tangible) use value of the forest products. Furthermore, both the descriptive and explanatory approaches are used. The descriptive approach describes social phenomena focusing on ‘how’ and ‘who’ questions where as the explanatory approach explains why something/events occurs ([Neuman, 2006](#)). This mix-up of two different approaches provides a detailed picture of the existing socio-economic condition of the poor and the contribution of enterprise oriented community forest (EOCF) to improve their condition in CFUGs.

This is case-study based research. Two different cases were taken for the validation of the result as well as the intended investigation of differences and similarity. Case study, in general, is a preferred strategy when “how” and “why” questions are being posed to identify or assess some measurable objectives ([Yin, 1994](#)). Two community forests, Bhitteri and Kalobhir are selected for the research to get in-depth information about the economic contribution of forest products on poor’s livelihoods.

The study universe comprises users of two community forests and sampling unit is an individual household of the forest. One respondent from each sampled household is selected and interviewed in detail. Thus, the unit of analysis adopted for this research is the household.

3.2. Research process

The research began with bringing thoughts on the problem areas and preparing research proposal. Series of discussion with supervisors encouraged critical thinking on concepts. Steps followed from the proposal preparation to write-up are presented in Figure 1.

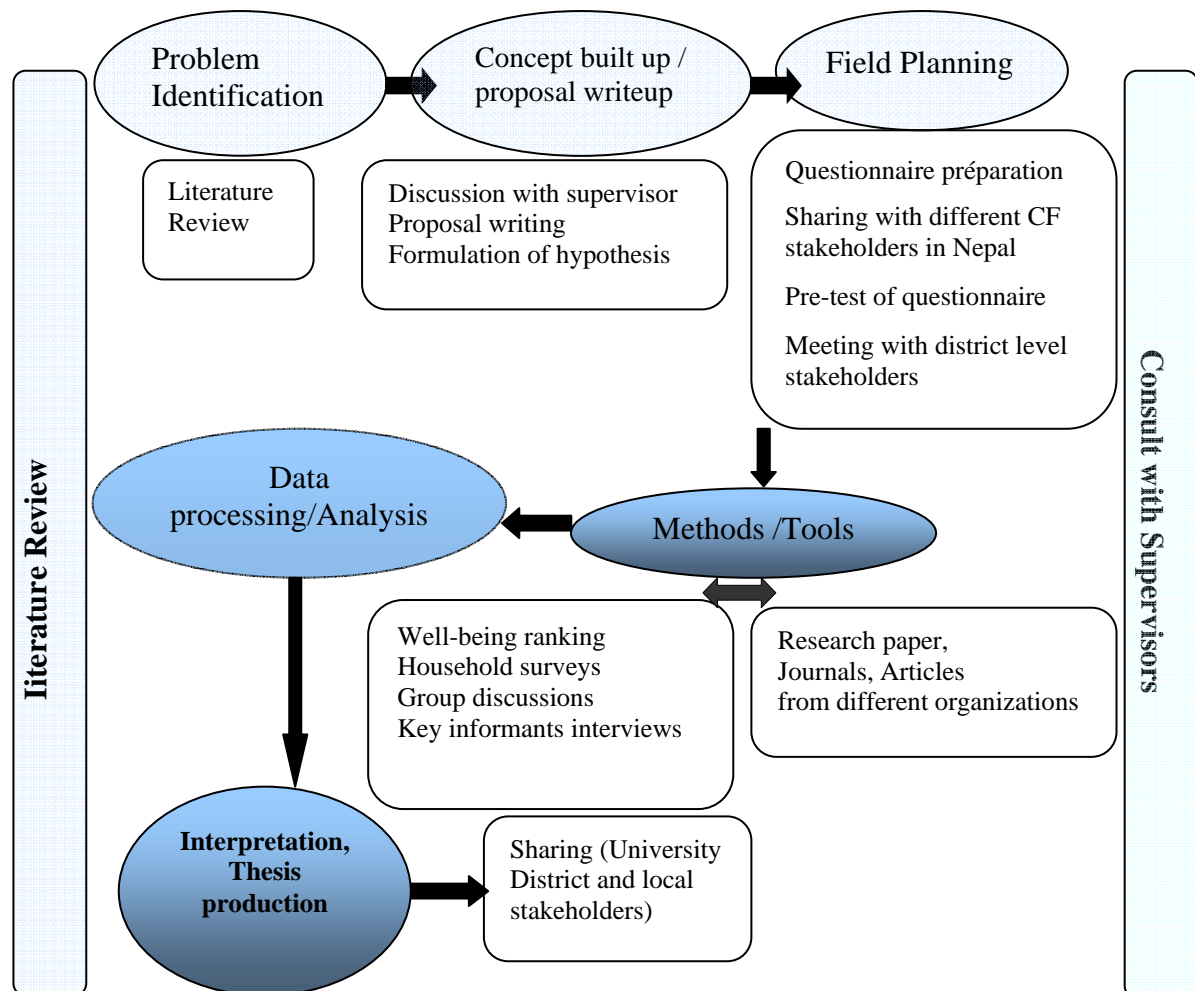


Figure 2: Overall research process

Proposal and draft questionnaires were prepared in the university. The questionnaire and checklist were pre-tested before the actual fieldwork for final tuning. Data were collected using certain methods after feedback from expert consultation.

After the fieldwork completed, sharing with local stakeholders, helped to gather more information on CFUGs and different aspects of information. Compilation of information, tabulation, processing and presentation of this information were part of data analysis. Reporting the results and subsequent discussions led to conclusions and recommendations.

3.3. Site selection

Dolakha, a central mid-hill district of Nepal and involvement of Asia Network for Sustainable Agriculture and Bioresources (ANSAB) since 1998, was selected for this research because of the researcher's familiarity to the place due to an employee of ANSAB during last five years period. In addition to this CF programme has been implemented in this district for the last three decades. The study areas, Kalobhir and Bhitari CFUGs, were selected purposively for having a running forest based enterprise for the last 5 years. Two community forests were selected to ensure that the entire spectrum of spatial and socio-economic variations is adequately represented.

The sampling unit is an individual household of the CFUG and individual representative of related stakeholders. Purposive selection of community forest users groups was done taking support from District Forest Office (DFO) staff members and other related organizations such as Nepal Swiss Community Forestry Programme (NSCFP), ANSAB, Federation of Community Forestry Users Nepal (FECOFUN), and Ecology Agriculture and Rural Development Society (ECARDS) working in that area.

The following criteria were considered during selection;

- The legal tenure of CFUGs (handed over before 5 years)
- CFUG running forest based enterprise
- CFUG's heterogeneity: Users included from all well-being categories
- CFUG having identified poor

3.4. Study area

On the basis of above criteria two CFUGs, Kalobhir and Bhittheri of Dolakha district, were selected for the study (see Figure 3)

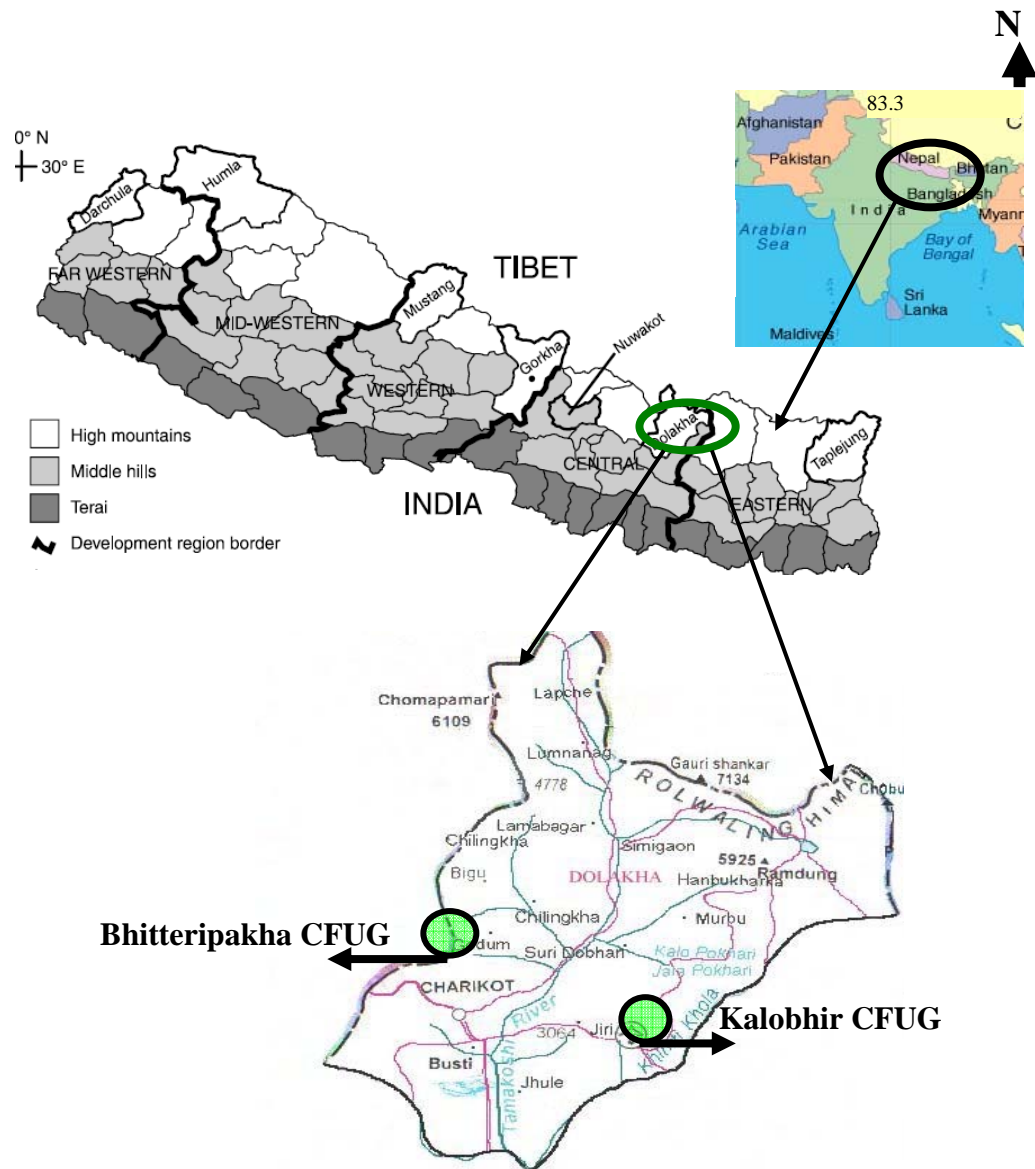


Figure 3: Map of Nepal and Dolakha district

Source: http://ncthakur.itgo.com/districtmaps/dolakha_district.htm

3.4.1 Background of Dolakha district

Dolakha, a mid-hill district of Janakpur zone, lies in the Central Development Region of Nepal. It is approximately 133 km north-east of the capital (DDC, 1995). The district, with its headquarter Charikot covers an area of 2191 km², about 1.49 % of the total area

of Nepal. Its geographical position extends between 27°28' N to 28°00' N longitude and 85°50' E to 86°32' E latitude and is located in the southern fringe of the high Himalayan range. The altitude ranges from 900 m to 7146 m. The district experiences a mild-temperate climate (DDC, 2002).

The district is administratively divided into 11 *Ilakas* and 55 Village Development Committees (VDCs). According to population census of 2001, the total population of the district is 217218 among them 108170 are male and 109048 are female. The average annual population growth rate is 2.5 % and the average family size is 5.43. The social composition is dominated by Chettri, Tamang, Brahmin, Newar, Jirel and others (CBS, 2003). The district has a high literacy rate (48.98%) with educational ratio of 1:1.7 (females: males). Consequently, it stands in the 24th position out of 75 districts of Nepal in the Human Resource Development Index.

The district is rich in biodiversity, especially NTFPs with 101500 ha of forest, which encompass 48% forest land, 26% agriculture land, 14% pasture land, 6% barren land, 3% water bodies and 3% snow land. Area covered by forest is more than the average forest covered area of Nepal, which is 39.6%. A total of 35111 HHs are getting benefits from the 289 CF which covers 75% of the HHs of the district (DFO, Dolakha 2006).

The major species is Khote salla (*Pinus roxburghii*) 45%, followed by broadleaves species Chilaune (*Schima wallichii*)14%, Gobre salla (*Pinus wallichiana*) 12%, Sal (*Shorea robusta*) 11% and other species and the major NTFPs are Lokta (*Daphne bholua*), Argeli (*Edgeworthia gardnerii*), Dhasingare (*Gaultheria frarantissima*), Majitho (*Rubia Manjhith*), Jhyau (*Permalia sps*), Chiraito (*Swertia chirayita*), Allo (*Girardiana diversifolia*), Angeri (*Loyania ovalifolia*), Pakhanbed (*Bergania ciliate*) and Salla cone (*Pinus cone*).

This district has a fairly a good composition of ethnic group and other caste, which is also reflected in user groups. It covers 60% of higher caste, 32% of ethnic group and 8% of lower caste also called the “untouchable” group in traditional Nepalese society. Similarly, the user committee is also dominated by higher caste Brahmin and Chhetri 63% and followed by ethnic group 29% and lower caste 8%. In the user committee, women represent 33%, which is just equivalent of national community forestry policy.

The sources of the income in both CFUGs are selling timber and NTFPs from CF covers 63% of total income, followed by membership fee, donation and grant 35% and other sources 2%. With regards to expenditure, they are spending mostly for community development activities such as donations for schools and clubs, road construction and construction of temples, which covers 34% of the total income. Apart from this, they spend 29% of their total income for the institutional development of CFUG, followed by 25% for forest development, 8% for income generation for poor people and 4 % for others.

In Dolakha district, NSCFP has been playing a major role in management and development of CF since 1990. Similarly, ANSAB is also working on CF management, natural product based enterprise development certification of CFUGs as well as products since 1998. There are more than 50 forest-based small and cottage industries. Out of which, 22 are furniture industries, 20 are local hand made paper industries, one is veneer industry, and 8 from different categories.

3.4.2 Background of the study site

3.4.2.1 Kalobhir community forest user group

With an area of 545.25 ha, the Kalobhir forest is located in Jiri valley, 55 km east of Charikot the district headquarter. The district headquarter and 188 Km northeast from Kathmandu, capital city. Its users include all the HHs of ward-7 and few from ward-8 & 9. There are 215 HHs with a total population of 1088. Its altitude ranges from 2000 m to 3300 m from the MSL, and covers sub-tropical to sub-alpine climate. This community forest was handed over on 30 March 2000 and after 5 years amendment was made on 14 July 2004. This CF was certified in 22 February 2005 by Forest Stewardship Council (FSC). The main occupation of the users is subsistence agriculture, and most of them fall into the economically medium class category. According to its 2004 constitution, the CFUG has an executive committee of 8 men and 5 women which consists of 11 tamang, 1 chettri, and 1 *dalit*¹.

Based on boundary, types of forest species and management objectives this forest is divided in 5 blocks while based on available species it is divided into three categories 1) mixed natural forest of Thingre salla (*Tsuga dumosa*), Gobre salla (*Pinus wallichiana*); 2)

¹ Dalit: lower caste and untouchable people in the Hindu culture

plantation forest of Rani Salla (*Pinus roxburghii*) and Pate Salla and; 3) mixed bushes forest. Beside the tree species the major NTFPs are Lokta (*Daphne bholua*), Argeli (*Edgeworthia gardnerii*), Dhasingare (*Gaultheria frarantissima*), Salla cone (*Pinus cone*), Allo (*Girardiana diversifolia*), Jhyau (*Permalia sps*), Chiraito (*Swertia chirayita*), Angeri (*Loyania ovalifolia*), Pakhanbed (*Bergania ciliate*), Majitho (*Rubia Manjhith*), Dhupi (*Juniperus indica*), Nigalo (*Drepanostachym intermedium*).

3.4.2.2 Bhiteripakha community forest user group

The Bhiteripakha forest is located at about 10 km west of Charikot, district headquarter. Its users include all of the HHs of wards-1, 2 and 3 of Boch VDC. This CF lies between 2100 - 3300 m from MSL, and has a climatic variation of sub-tropical to sub-alpine. There are 234 HHs with a total population of 1338. This CFUG is ethnically and economically heterogeneous with the majority of the population of the Tamang. The main occupations are agriculture, service, small business and wages work. This forest was handed over to users on 30 March 2000 and amendment was made on 24 September 2004, which is then certified in 22 February 2005 by Forest Stewardship Council. The total area of this CFUG is 362.31 ha. According to its constitution in 2004, the CFUG has an executive committee of 12 men and 3 women which consists of 8 tamang, 7 chettri, and no *dalit*.

For the better management of forest, management objectives and boundary it is divided in 11 blocks based on forest types. Likewise, on the basis of forest species, it is divided into four classes; 1) natural forest of Thingre salla (*Tsuga dumosa*) and Gobre salla (*Pinus wallichiana*), 2) mixed natural forest of kharsu (*Quercus sps.*), Baset and Kholme, 3) plantation forest of Rani salla (*Pinus roxburghii*) and pate salla, and 4) mixed bushes forest. Major NTFPs are Lokta (*Daphne bholua*), Argeli (*Edgeworthia gardnerii*), Jhyau (*Permalia sps*), Chiraito (*Swertia chirayita*), Dhasingare (*Gaultheria frarantissima*), Nigalo (*Drepanostachym intermedium*), Angeri (*Loyania ovalifolia*), Pakhanbed (*Bergania ciliate*) Majitho (*Rubia Manjhith*), Sallo cone (*Pinus cone*), Dhupi (*Juniperus indica*), and Allo (*Girardiana diversifolia*).

Table 1: Overview of sampled CFUGs

SN	Name of CFUG	Year of Handover	Area	Economic Participants			Major NTFPs Products	Enterprises						
				HHs	Male	Female		SG	BE	DC	TD	FD	LE	EE
1	Kalobhir	30.03.00 (24.09.04)	545	215	553	535	Lokta, Argeli	-	-	-	-	1	1	1
2	Bhitteri pakha	30.03.00 (14.07.04)	362	234	656	642	Lokta, Argeli	5	1	1	1	-	1	-
Total			907	449	1209	1177	-	5	1	1	1	1	2	1

SG: Sub-group, BE: Bhimeshwor Handmade Paper, DC: Deodhunga wintergreen distillation, TD: Timber depot, FD: Fuelwood depot, LE: Lokta and Others NTFPs (cultivation, harvesting and trading) FUG enterprise, EE: Everest Gateway Handmade Paper

Figure in the parentheses indicates the year of renew

Source: ANSAB office data, 2007

3.4.3 Household sampling

At the second step, based on the records of CFUGs, a statistically reliable sampling frame was made. The household was considered as the lowest unit for sampling. Total households in each CFUG were classified into four economic classes namely very poor, poor, medium and rich with the help of a participatory tool, a so- called “well-being” ranking.

In order to identify the households to be surveyed, stratified random sampling was applied. To do so, a running number starting from 1 was assigned to all households in each stratum (N). The required number of households (n) was drawn using a random number table. From each stratum 25% of the households were selected for survey. The heads of the households were identified for detailed interview, with the help of committee members and local enumerator.

3.5. Survey methods and data collection

The research methodology includes a field study to generate primary data, and a review of available literature on the subject for secondary data collection. For the **primary data collection** interview with CFUG members, well being ranking, household sampling, free listing, household survey, group discussions, key informant interviews, and informal recording of information were carried out. The sequences of explaining method imply the chronological order of the method applied in the field work in addition the analysis of the result is also in the same sequence.

Table 2: Objectives wise research methodology used

SN.	Objectives	Methodologies
1	To know the preference of forest products for different economic classes.	Free listing, Household survey, Committee meeting, Key informant interview
2	To assess the benefit sharing mechanism in community forest users groups (CFUGs) concerning direct and indirect (tangible) benefit.	Household survey, Group discussion, Informal recording of information
3	To analyze the economic contribution of community forest in household income among different socio-economic groups	Household survey, Committee meeting and records, Group meeting, Informal recording of information from enterprise, Secondary data

3.5.1 Tools use for primary data collection

3.5.1.1 CFUGC members' interview

CFUGC members were interviewed to find out their management plan for distribution of CF benefit and the actual implementation in the field. The interviews were carried out with seven executive members including 2 female in the Bhitleri CFUG and the nine executive members including 3 female in Kalobhir CFUG. The reason of the interview was also to determine the management plan and reason for the gap in the implementation. The local price of the forest products and the agriculture goods was also sought in the interview. In addition to this, interviews also helped to triangulate the involvement of the different economic class users in different CF activities.

3.5.1.2 Well-being ranking

Well-being ranking is a useful tool for the grouping of households according to their relative wealth status ([Chambers, 1994](#)). In this study, it was used to assess the economic status of the households, with the help of key informants. The Meta Cards were used during this process. Three key informants were selected from each CFUG. All the names of household heads were written separately in Meta Cards. Then, the researcher worked with the key informant individually in a private place where the key informant felt comfortable. The researcher gave the broad description of well-being. Then the researcher asked key informants to put the cards into groups, whereby the households in the groups

were relatively similar in their level of wealth. After piling up of all cards in groups, again each card of every pile was read out so that key informant could change his/her mind. The pile having more than 40% of cards was again subdivided into two piles. While doing well-being ranking the characteristic for assessing wealth was left to key informants. Only after completing the piling up, the researcher asked the reason for putting each household into that group. After completing the interview, the researcher assigned a score for each group. The Nepali letters Ka (A), Kha (B), Ga (C) and Gha (D) were used to denote rich, medium, poor and very poor classes respectively. The criteria adopted were based on food availability, land holding size, house condition, and number of livestock, educational status, service, and business of the users. This same procedure was repeated for other key informants. After averaging the score for each household, the researcher grouped the households into four well being strata. Triangulation was done separately to verify very poor class users with already identified very poor by the NSCFP (Nepal Swiss Community Forestry Programme)/ DFO (District Forest Office while making the operational plan. Criteria given by key informants for assessing different well-being classes were compiled in (see Annex-I).

3.5.1.3 Free listing

Free listing was done to find out the list of important forest products in the perspectives of forest users. The format as used by [Weller and Romney \(1988\)](#) was followed. This method uncovers the information as much as possible as respondent do not have any boundary to give information. Respondent were asked about the forest products they are getting from CF. Free listing of forest products was done by randomly selected four individuals each from different economic class in each CFUG. Products with higher frequency were selected as the most important products.

3.5.1.4 Household survey

The most commonly used method of data collection in sample survey is personal interview. This procedure requires the interviewers to ask prepared questions and to record the respondents' answers ([Schaeffer et al., 1990](#)).

Literature review and field experience of the researcher and the research assistant were used to develop the survey questionnaire. After the preparation of draft questionnaire, pre-testing was undertaken in one CFUG which resides outside the sample frame, ie in

Bhaktpur district. While conducting the pre-testing, different difficulties and repetition were found, and after correction the questionnaire was modified into the final questionnaire. 25% randomly selected households were surveyed from each of the four economic strata. Respondents from each CFUG were interviewed using a self administered semi-structured questionnaire (see Annex II). Interview was carried out with household head as far as possible, in case of unavailability of household head second person or mature person from the household was interviewed.

Questions were asked to obtain information on household size, land and livestock holdings, quantity of forest products collected from CF and time required. In addition to that information regarding preference of major forest products, participation in decision-making process for the management and utilization of CF, attitude towards CF management, and cost incurred for each household in forest management and protection activities were also obtained.

Table 3: Total households according to economic class

SN	Name of CFUGs	Total HHs	No. of households			
			Rich	Medium	Poor	Very Poor
1	Kalobhir	215	47 (12)	106 (27)	39 (10)	23 (6)
2	Bhitteri	234	51 (13)	88 (22)	60 (16)	35 (9)
	Total	449	98 (25)	194 (49)	99 (25)	58 (16)

Figure in the parentheses indicates the respondent surveyed

Source: Field data, 2007

3.5.1.4.1 Preference

Data for the preferences analysis were collected from the household survey. The main focus of this study is to determine the most preferred forest product by different economic classes. Each household was asked to rank the selected five forest products on the basis of their economic value and daily use. Average ordinal value for preference of forest products with preference to economic class was calculated and analyzed using a stake bar diagram in percentage. Furthermore, the average ordinal value was presented in scatter diagram. Average preference value, being non parametric, statistical analysis is performed using Chi-Square test. It is used to test the significant difference on preference of forest products among different classes.

Preference: The preference of the forest products was recorded using five categories. These are; 1 = No preference, 2 = Low preference, 3 = Medium preference, 4= Satisfactory preference and 5= High preference.

To perform Chi-Square test as well as other related analysis it was difficult, being a lesser number of the respondents and no of the categories. The result shows there were no responses in a few cells. So, the categories for the preference were again aggregated by average, into three categories and then transferred the result. Where as;

No preference & Low preference:	1	Low preference
Satisfactory preference &Medium preference:	2	Medium preference
High preference:	3	High preference

3.5.1.4.2 Participation

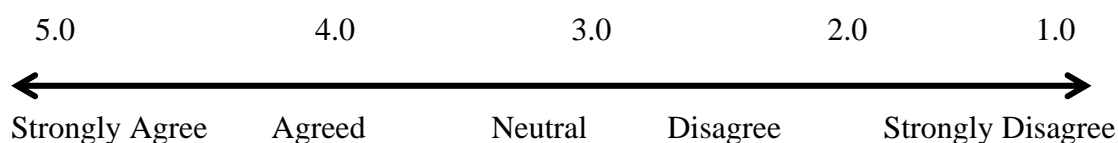
Participation of respondents in community activities was judged in terms of their participation in General Assembly (GA) / meetings and training/workshops/tours. At first, respondents were asked to indicate their presence in GA / meeting and training/workshops/tours in past one year of period.

The households who used to participate in GA and meetings were again asked to mention their level of participation in those meetings. They were asked to rate their level of participation in a according to the "A Ladder of Citizen Participation," with three levels as simplified by (Arnstein 1969) such as non-participation, tokenism and citizen Power. Where non-participation includes those respondents who present in meetings but never speak and tokenism includes those who share their view but don't know whether or not their views were accepted. Whereas, the citizen power was that in which they have their right to decide. Further, the households who ranked their participation either tokenism or citizen power were again asked, whether or not the CFUGC listened to their voice. In this study, independent variables are the economic classes. To analyze the relationship between the independent variable and the participation, a bar diagram was used.

3.5.1.4.3 Attitude

Users' attitude on Community Forestry functioning system was assessed using a five point Likert type scale. Users were asked for their opinion on mainly three functions; 1) fund mobilization, 2) benefit sharing, and 3) decision-making. For this, respondents were

asked to give their opinion on above three aspects of community forestry in Likert-scale ranging from 1.0 to 5.0 for strongly disagree to strongly agree respectively. Data obtained was analyzed using the spider diagram. Attitudinal ranking was assessed by;



3.5.1.5 Group discussions

Eight group discussions (GDs) were organized in two CFUGs with the different economic classes to collect the different information on similar things. Groups were selected from each economic class of multiple respondents having similar background to discuss the research issue. To make discussion more effective and fruitful, they were facilitated through checklist (see Annex III). The number of participants in each GD varies from 6 to 12 individuals, which was also recommended by [Gentle, \(2000\)](#) after [Greenbaum, \(1988\)](#) cited in [Paudel, \(2003\)](#). The discussion was carried out for one to two hours.

Table 4: Respondent of GD

SN	Name of CFUGs	No. of respondents			
		Rich (M/F)	Medium(M/F)	Poor (M/F)	Very Poor (M/F)
1	Kalobhir	8 (6/2)	10 (7/3)	7 (3/4)	6 (4/2)
2	Bhitteri	7 (4/3)	12 (7/5)	9 (4/5)	7 (4/3)
	Total	15 (10/5)	22 (14/8)	16 (7/9)	13 (8/5)

M: Male and F: Female

Source: Field data, 2007

3.5.1.6 Key informant interviews

For this study, key informants were people having in-depth knowledge of CFUG management as well as possessing awareness of the different socio-economic status of the community members. Eight key informants; ex-committee member, trader, enterprise manager or staff, NTFP collector, four from each CFUG and two from staff of facilitating organizations (I/NGOs and DFO staff) was selected. Ex-committee member, trader and NTFP collector were identified through informal discussion with CFUGC members. Interviews were carried out to get in-depth information about the economic contribution of the forest products on the livelihood of different economic class users. Checklist

(Annex IV) was used to make discussion more effective as well as focus towards the subject matter.

3.5.1.7 Informal recording of information

Informal recording of information (IRI) was done during the field visit, household survey and different types of group discussions. Information was recorded on the condition of the house, farms, cropping patterns, and some additional aspects which are not included in the questionnaire survey. Participation and discussion of committee members during meetings and assembly was also observed and recorded. In addition, the researcher also participated in informal discussion in the tea shop and on the village site.

3.5.2 Secondary data collection

3.5.2.1 Forest management information

Data from forest management plan and CFUGC record were used to verify the information collected from the household survey and the interview with the CFUGC members. The following information was taken from the operational plans and constitution of two sampled CFUGs: (i) decision-making process (ii) frequency of CFUGC meeting to discuss and implement operational plan (iii) quantity of forest product sold or distributed, (iv) representation of women and poor people in the committee (v) responsibilities of CFUG and CFUGC, and (vi) cost of forest management and protection. In addition to this financial and administrative records of CFUGs were also reviewed.

3.5.2.2 Documents review

Apart from the CFUG records, literature review went concurrently with the primary research methods starting before study design and continuing alongside data collection, analysis, and write-up to identify the related information required for the study. It involves the reviewing of available existing literature on the related subject matter area as well as similar case studies outside the Nepal. In addition to this, data were also collected from published and unpublished reports of various organizations working in the study area such as DFO, ANSAB, ECARDs, FECOFUN/ Dolakha and NSCFP.

3.6. Methods used to organize, process and analyze the data

The data analysis consists of organizing and tabulating data, performing statistical analysis, and drawing inferences (Panta and Wolf, 2002). In this research both qualitative and quantitative tools were used for data analysis. Obtained information from different types of group discussion was transcribed and presented in written text. The data collected from the semi-structured questionnaire in the household survey were first coded, categorized and then transferred to SPSS datasheet (Statistical Package for Social Science) version 15.0. After entering the data it was processed using the cross tabulation method and then this table was analyzed using MS Excel.

Frequency distributions, percentages, descriptive statistics, mean distributions, standard deviation, were used to describe the variables under study on the preference of forest products, participation. Furthermore, cross tabulation analyses were carried out to find out the relationship and associations among the variables. Bar diagrams / stake bar diagram, spider diagram and pie charts were also used to interpret the forest income and overall income. Inferential statistic particularly chi-square was used. In addition, the Lorenz curve and Gini-coefficient were used to determine the income inequality among the different economic classes. Benefit Cost Ratio (BCR) was used to determine the profitability of the CF management and Per Capita Income (PCI) was calculated to know the individual income from CF.

3.6.1. Chi-square test

This is a statistical tool used to compare observed sample frequency with expected frequency, to determine whether or not the difference between them is statically significant. In this study, data for preference were taken with the help of three point ranking ordinal scale (low preference to high preference) and it was analyzed according to the grouping variable economic classes. As data were in ranking scale so, the non parametric test was used. This test was used to determine whether or not the difference between them is statistically significant.

Furthermore, since forest income and total household income were not normally distributed, the *Kruskal Wallis Test* was used to analyze the difference in economic classes and the caste in Kalobhir CFUG. In Bhitripakha CFUG, *Mann-Whitney U test* was used for the analysis of income with caste and for household head (gender) of both

CFUG. It was because there was only two grouping variables for caste in Bhitteripakha; higher caste, middle caste and for sex (male, female) in both CFUGs.

3.6.2. Valuation of forest products

The commonly usable measures for economic valuation of forest products are indicated in figure 4. As the villagers obtained different products from the CF, the use of a single technique may not be sufficient to measure the economic value of different forest products.

The different methods for economic evaluation are:

1. **Direct market pricing technique:** This method was used for the products which were in trade and prices were exists in the local market. This method was used to calculate the value of timber and fuelwood.
2. **Indirect pricing technique:** Gregersen et al., (1995) described different indirect pricing techniques for the valuation of forest products such as, surrogate prices, opportunity cost, replacement cost, hedonic price and the travel cost techniques. As this study focuses only on the tangible benefits of the forest, the *surrogate prices method* was used for the valuation of fodder, and *opportunity cost method* was used for the valuation of leaf litter. For the surrogate prices method, the value of fodder was calculated with the reference of the value of most potential alternative feed. In this, the value of wheat / millet straw was taken. For the valuation of leaf litter, as it doesn't have any alternative product, the opportunity cost of time that household spent to bring it from second nearest forest was used as described by (Gregersen et al., 1995). For this, the time spent to collect, process and transport a *bhari*² (back load) of leaf litter from another nearest forest was calculated. Total time spent was then multiplied with local agriculture labor wage to get the value of one bhari of leaf litter. Time, in hours is converted into monetary term on the reference of the daily wages (³NRS 50) per 8 hours a day. The cost of fodder was estimated comparing with the alternative products wheat & millet straw.

² Bhari is local unit for measuring fuel wood in the mid-hills of Nepal (one bhari = 30 kg)

³ Nepalese Rupees (Whereas, US\$ 1 = NRS 65)

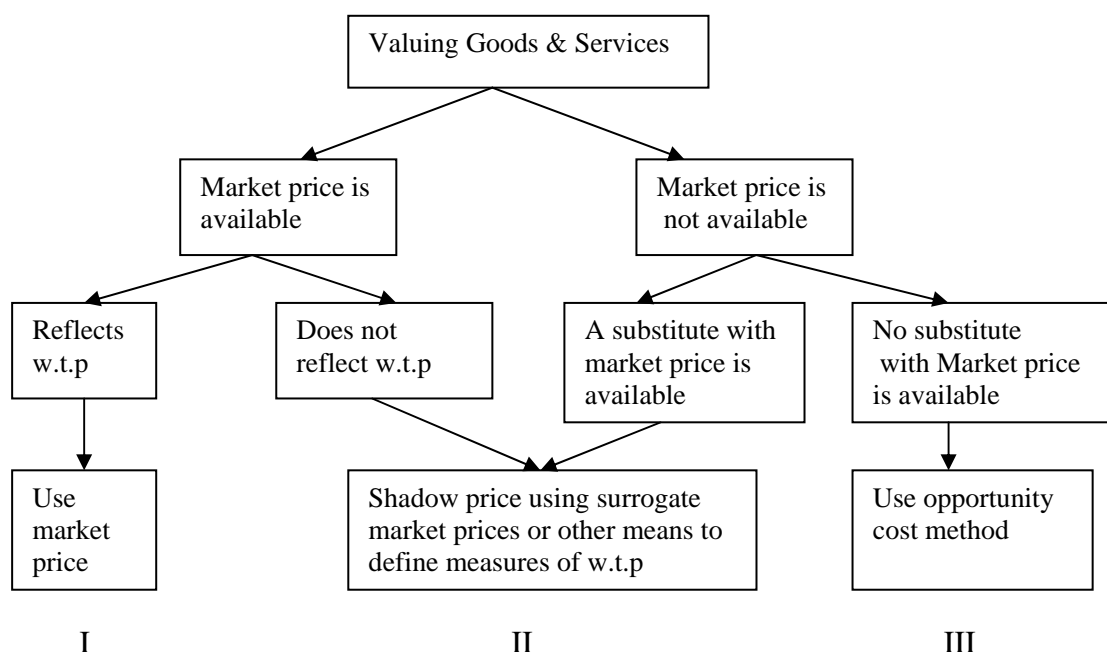


Figure 4: Valuation of forest products adopted (Gregersen et al., 1995)

Note: (w.t.p) Willingness to Pay

The cash income and substitute benefit from the forest was calculated to find out the income inequalities and its distribution among different classes. In addition, it was also used to calculate the benefit cost ratio (BCR) and the per capita income of the household. The cost of the manpower involved in CF management and development works were summed to obtain the cost of the labour used in CFs. This was obtained by multiplying the wage rate of labour of the village with total time spent.

3.6.3. Analysis of household income

Lorenz curve and Gini-coefficients are used to show the income inequality among the sampled households. The Lorenz curve is a function of the cumulative proportion of ordered individual values mapped onto the corresponding cumulative proportion of their size (Lorenz et al., 1905). If all individuals have the same income, the Lorenz curve is a straight diagonal line, called the line of equality. If there is any inequality in income, the Lorenz curve falls below the “line of equality”. The total amount of inequality can be summarized by the Gini-coefficient (also called the Gini ratio), which is the ratio between the area enclosed by the line of equality and the Lorenz curve and the total triangular area under the line of equality. The Gini-coefficient is a number between 0 and 1, where 0 corresponds with perfect equality (i.e. everyone has the same income) and 1 corresponds

with perfect inequality (i.e. one person has all the income, and everyone else has zero income). Gini-coefficient (G) can be computed using,

$$G = \frac{1}{\mu N(N-1)} \sum_{i>j} \sum_i |x_i - x_j|$$

Where, μ is the mean income, n is the total number of sampled households, and x_i and x_j are the shares of individuals i and j in total income. Alternatively, an equivalent but computationally more convenient method suggested by [Deaton, \(1997\)](#) was used which is expressed as,

$$G = \frac{N+1}{N-1} - \frac{2}{N(N-1)\mu} \sum_{i=1}^N \rho_i x_i$$

Where, ρ_i is the rank of individual i in the income distribution, x_i , counting from the top, i.e. the richest has the rank 1, second richest 2 and so on.

3.6.4. Benefit cost analysis

This study quantifies the benefit and cost from the community forests for each economic class. Two types of cost were identified by the users for the analysis: **Forestry operation cost** includes the time spent in collecting the forest products (timber, fuelwood, fodder, leaf litter, NTFPs) including the return travel time as well as employment in the forest based enterprises and benefit from IGA activities supported by the CFUG. In addition, if the forest products were sellable on the market, the time required to reach and be sold on the market was also calculated. **Opportunity cost** includes time spent in institutional development activities (meetings) and forest development activities (silviculture work). However, it did not cover depreciation of tools as they are very simple, axe, hand saw were used.

Both of these costs were added and then the total cost of the each economic class was calculated. Other cost, such as reception to the visitor, and informal meeting were not included in this calculation. Overall data for the benefit cost analysis was collected from the household survey (25%) of each economic class. The costs incurred were quantified and changed into monetary terms for the calculation. The benefit was deemed in this study as the value of entire tangible goods received from CF.

To calculate BCR, first total benefit of each household is converted into benefit @ NRs 100 cost to give similar weightage for benefit. The calculation was done as follows:

$$\text{Benefit at NRs 100 cost} = \text{Benefit} / \text{Cost} * 100$$

$$\text{BCR} = \text{Benefit at NRs 100 cost} / 100$$

3.6.5. Per capita income

In this study, per capita income of community forest income (cash income and subsistence use in monetary form) and total other household income (Agriculture, Livestock, Offfarm activities) was calculated to find out the income of each individual of each class. This is calculated dividing household income by the number of household population.

Chapter 4: Results

This chapter consists of five broad sections and many subsections. The first section provides an overview of the socioeconomic condition of the respondents of two community forests. The second section outlines the preference on the forest products and their economic value. The third section covers the participation of the users in decision-making process/skill development activities and the benefit from the CF. Following, the fourth section deals with the flow and distribution of the community forest benefits. Finally, the fifth section presents the contribution of the CF in household level income.

4.1 Socioeconomic profile

4.1.1 Sex composition of respondents

Sex composition of respondents is one of the major components in social study. The total sample (n=115), approximately 45.2% (52) are female and 54.8% (63) are male. In Bhiteripakha CFUG, male and female respondents are more or less equal whereas in Kalobhir CFUG, the numbers of male respondents are slightly higher than that of female respondents. The total population of the sample households consists of 52.6% (151), 47.6% (162) male and 47.3% (136), 52.3% (178) female in Kalobhir and Bhitteripakha respectively (Table 6).

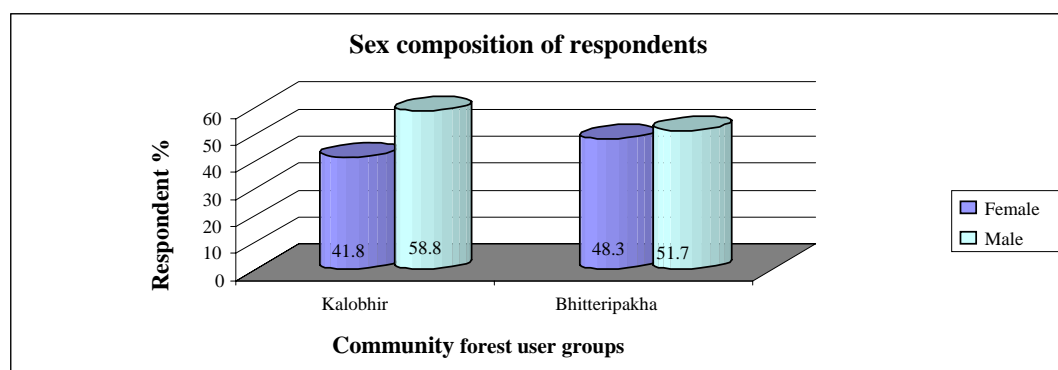


Figure 5: Sex composition of respondents (n=55 Kalobhir and n=60 Bhitteripakha) Souece: Field data 2007

4.1.2 Household head of respondents

For this study, household head is considered as one variable. In both the forests it is found that majority of the house (>80%) are headed by the male.

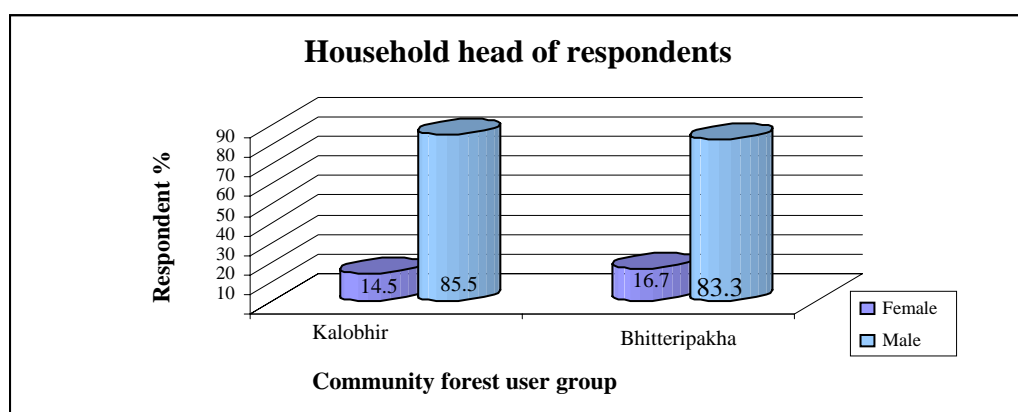


Figure 6: Household head of respondents (n=55 in Kalobhir and n=60 in Bhitteripakha) Source: Field data, 2007

4.1.3 Caste composition of respondents

For this study, castes were grouped into three major categories; higher caste, ethnic group and lower caste. The higher caste encompasses *Brahman* and *Chhetri*; the Ethnic group includes *Jirel*, *Tamang*, *Sherpa*, *Newar* and *Bhujel* and the lower caste consists of *Damai* (Tailor) and *Kami* (Blacksmith).

Caste composition

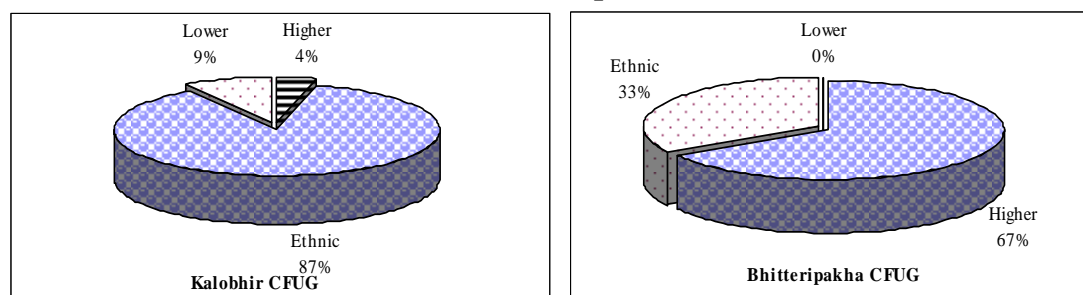


Figure 7: Caste compositions of respondents (n=55 Kalobhir and n=60 Bhitteripakha) Source: Field data, 2007

Figure 7 shows caste composition of the two CFUGs. In Kalobhir CFUG, out of 60 respondents the majority (87%) are from ethnic group whereas the lower caste and the higher caste are only 9% and 4% respectively. Similarly, in Bhitteripakha CFUG, out of total 55 respondents, two third (66.7%) respondents are from higher caste and one third (33.3%) are ethnic group. There is no any respondent from the lower caste, as CFUG itself does not have any users from the lower caste.

4.1.4 Educational status of respondents

Education is an important indicator in determining the status of the community and its development. For this study, education of the respondents is classified into three categories viz; (1) Illiterate (2) School Leaving (3) Higher secondary education.

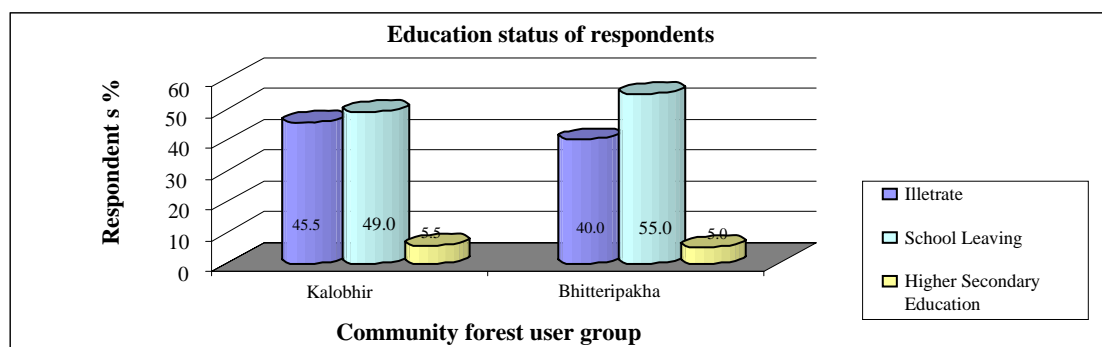


Figure 8: Educational status of respondents (n=55 Kalobhir and n=60 Bhitteripakha) Source: Field data, 2007

In both CFUGs, more than 40% of respondent are illiterate whereas almost half in Kalobhir and more than half in Bhitteripakha have education up to School Leaving Certificate. The percentage of respondents having higher secondary education in both CFUGs is very low (around 5%).

4.1.5 Economic status of respondent's household

Economic status of the household was determined from well-being ranking with the help of key informants. In this study, sampled household were divided into four categories; rich, medium, poor and very poor according to criteria set by informant themselves.

Table 5: Economic status of respondents

Economic Status	Kalobhir CFUG		Bhitteripakha CFUG	
	Total HHs	Respondents	Total HHs	Respondents
Rich	47 (21.9)	12 (21.8)	51 (21.8)	13 (21.7)
Medium	108 (50.2)	27 (49.1)	88 (37.6)	22 (36.7)
Poor	37 (17.2)	10 (18.2)	60 (25.6)	16 (26.7)
Very Poor	23 (10.7)	6 (10.9)	35 (15.0)	9 (15.0)
Total	215 (100%)	55 (100%)	234 (100%)	60 (100%)

(n=55 in Kalobhir and n=60 in Bhitteripakha)

Source: Field data, 2007

Figures in the parentheses () indicate the percentage household

Out of total respondents, 21.8%, 49.1%, 18.2%, 10.9% are from rich, medium and poor and very poor respectively in Kalobhir CFUG. Similarly, 21.7%, 36.7%, 26.7%, 15.0% respectively are from Bhitteripakha CFUG.

Table 6: General overview respondents

Categories		Kalobhir	Bhitteripakha	Total
Respondent Number		55	60	115
Sex	Female	23	29	52
	Male	32	31	63
Respondent's Age Group	20-30 Yrs	9	13	22
	31-40 Yrs	13	14	27
	41-50 Yrs	19	18	37
	51-60 Yrs	6	9	15
	>60 Yrs	8	6	14
Well being of Respondent	Rich	12	13	25
	Medium	27	22	49
	Poor	10	16	25
	Very Poor	6	9	16
Population of Sampled household	Male	151	136	287
	Female	162	178	340
Educational Status of Sampled Household	Illiterate	86	101	187
	School leaving	174	209	383
	Higher Secondary Education	32	10	42

Source: Field data, 2007

4.2 Preference on major forest products and its economic value

4.2.1 Major forest products

Free listing was done to identify major forest products in each CFUG with individual of each economic class. Result from free listing of CF products is tabulated in Table 6. It shows fuelwood was mentioned by all users of both CFUG hence has highest frequency. Forest product having frequency more than eight is considered as major product.

Table 7: Frequency of forest products listed

Forest Product (Kalobhir CF)	Frequency	Forest Product (Bhitteripakha CF)	Frequency
Timber	10	Timber	10
Fodder /grass	12	Fodder /grass	13
Fuelwood	16	Fuelwood	16
Thaching material	7	Thaching material	8
Wild fruit	3	Wild fruit	4
NTFP	11	NTFP	11
Leaf litter	12	Leaf litter	13
Agriculture implements	7	Agriculture implements	8
n=16		n=16	

As a result, fuelwood, fodder/grass, leaf litter, timber and NTFPs have frequency more than eight and are selected as major forest products. Other forest products having frequency less than eight are excluded from this study.

4.2.2 Preference on forest products

Respondents were asked for their preference on major forest products in three point ordinal scale (1 to 3). In *Kalobhir CFUG*, Figure 9 shows that timber is highly preferred by the majority of rich while fuelwood is preferred by almost all respondents, except half of the rich and some very few from other classes. Preference of timber decreases as economic status of respondent's decreases, whereas preference of the fuelwood decreases as economic status of respondent improves.

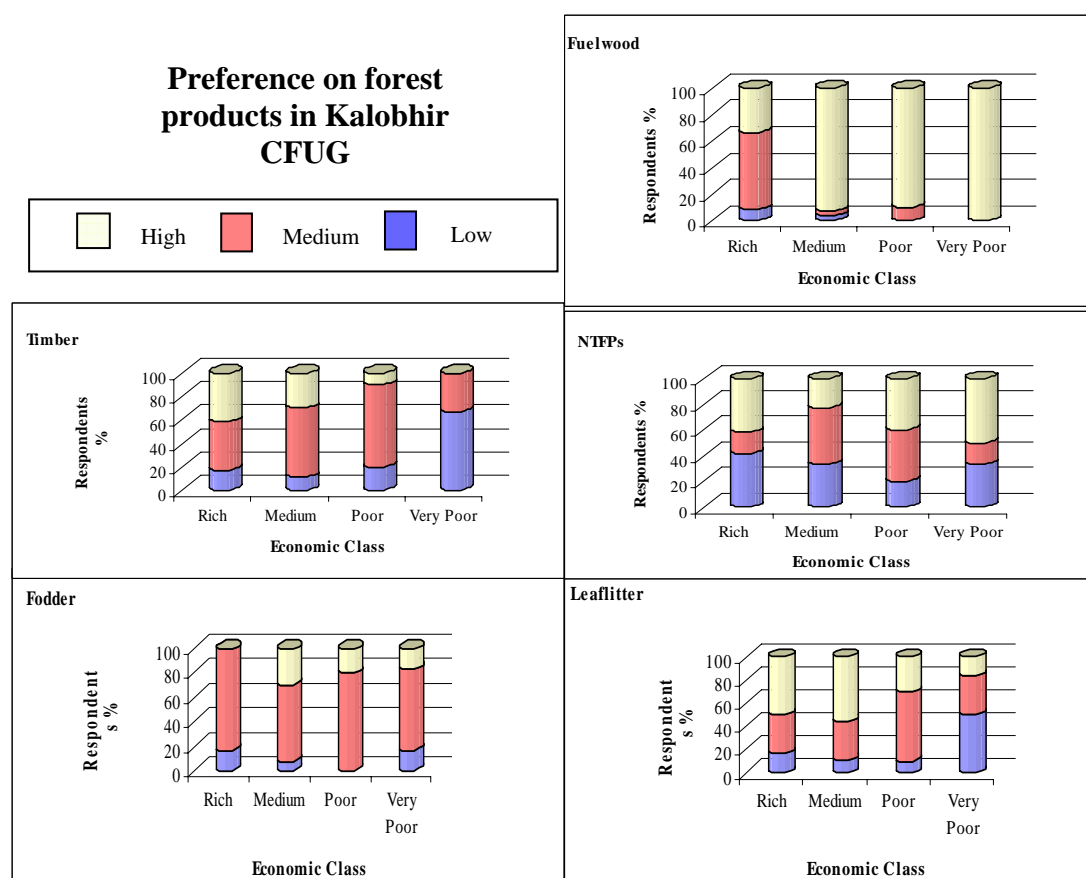


Figure 9: Preference on forest products in Kalobhir CFUG

Source: Household survey, 2007

NTFPs are highly preferred by nearly 50% of almost all classes except middle class. As in fuelwood, the very poor class preferred it more in comparison to other classes, whereas almost one third of the respondents of all classes except poor class have low preference.

Likewise, in fodder more than two third respondents from all economic classes have medium preference. Nearly one-fifth of respondents from all classes have mentioned it high preferred product while none of the respondents from the rich class have high preference on it.

Similarly, more than 50% respondents of rich and middle class have high preference on leafletter whereas for 60% respondents from poor class and 50% from very poor class, it is medium and low preference respectively. It shows that preference of leaflitter is also increase with improvement of economic status.

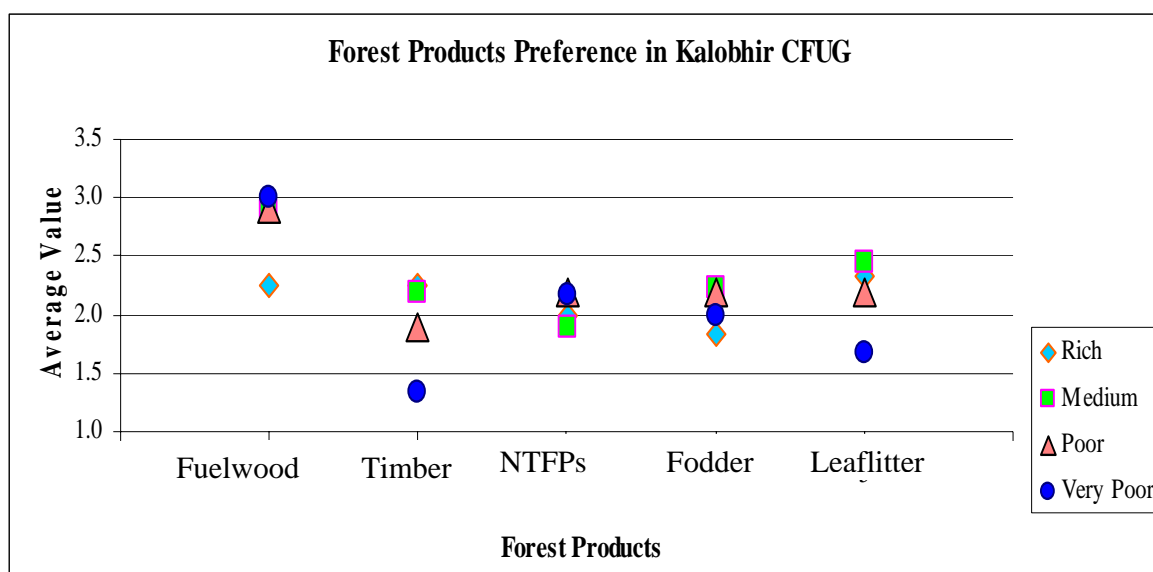


Figure 10: Preference on forest products on an average

Source: Household survey, 2007

Scattered plot was drawn taking average value given by each class for each forest product. Average values were calculated by ordinal scale with 3 levels and coded from 1 to 3. Figure 10 shows the average value given by each economic class for different forest products. Among different forest products, fuelwood is the most preferred forest product for all economic classes except rich class. Rich and medium classes prefer timber and leaflitter most whereas rich has the lowest preference for fodder and medium class for NTFPs. Timber and leaflitter are least preferred products for very poor class.

In *Bhitteripakha CFUG*, as in Kalobhir, the rich class respondents in this CFUG have also given a high preference for timber in comparison to the respondents from other class. In addition, none of the respondent form poor and very poor mentioned it as high preference. Further, more than 50% respondents of the very poor class considered it as a low preference product.

Similarly, in this CFUG also fuelwood is the most preferred forest product across all economic classes. More than 90% of households from all classes, except from the rich class, mentioned it as a highly preferred product. Moreover, few households (7.7%) from rich class mentioned it as a low value product, while none of the households from other economic classes mentioned it as a low value product.

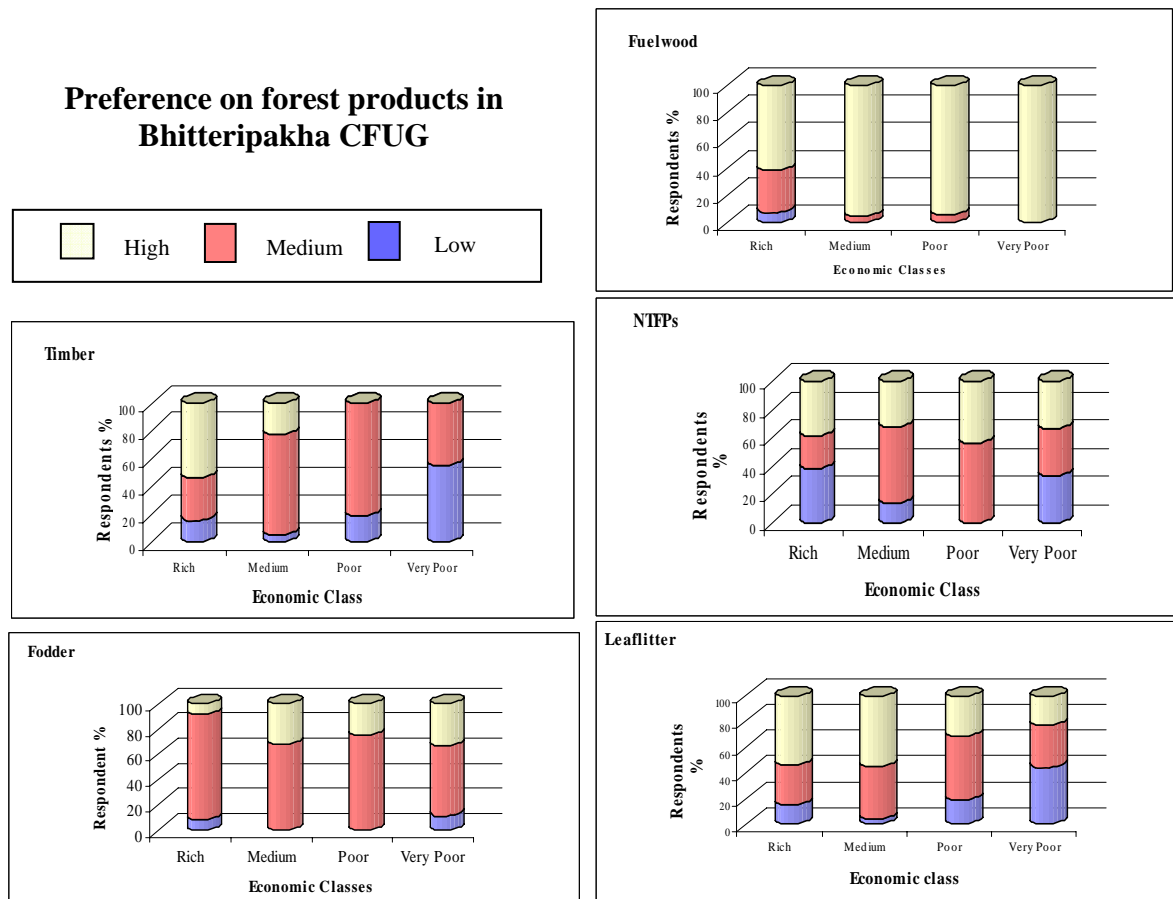


Figure 11: Preference on forest products in Bhitteripakha CFUG Source: Household survey, 2007

Likewise, approximately one third respondents of all classes have a high preference for NTFPs. For half of respondents of poor class, the preference is medium. No respondent of poor class mentioned it as low preferred, whereas one-third of respondents from very poor class mentioned it as low preferred.

In case of fodder, more than 80% respondents from rich class indicated it as a medium preferred value product whereas only few have high and low preference. More than one-third of respondents from medium class indicate high preference and two-third as a

medium preference while none of the respondents indicated as a low preference. For one-fourth respondents of poor class have high preference and three-fourth have medium preference. Likewise, one-third respondents of very poor class have high preference and only some respondents from this class have low preference on it.

Likewise, in case of leaf litter, more than 50% respondents from rich and medium classes indicate as a high preference while nearly half respondents from very poor class mentioned it as a low preferred product. Similarly, almost one-third respondents from poor indicate high preference while half of them mentioned it as a medium preferred product.

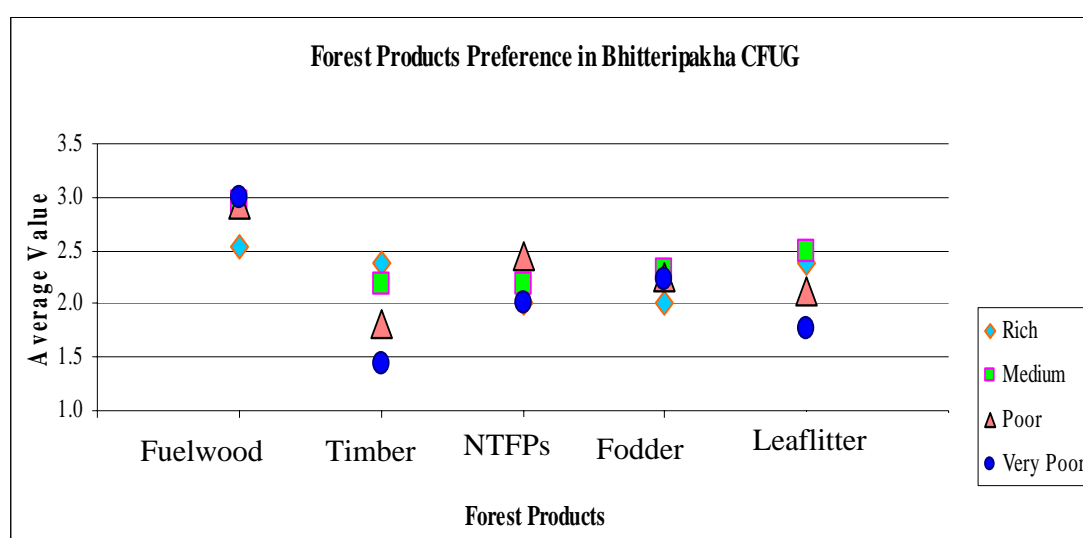


Figure 12: Preference on forest products in an average Source: Household survey, 2007

Figure 12 shows the average value given by each class for the above forest products in Bitteripakha CFUG. In this CFUG also fuelwood is most preferred product in comparison to other products. Similarly, as in Kalobhir, timber and leaf litter are highly preferred by rich and medium classes whereas it is least preferred by poor and very poor classes. Likewise, very poor class has high preference on fuelwood whereas they have least preference on timber, NTFPs and leaf litter.

4.2.3 Test inference on the preference of forest product

Individual statistical analysis was done for the two sample CFUGs. In *Kalobhir CFUG*, statistical analysis shows that there is a significant difference on the preference of fuelwood and timber among different economic classes. Table 8 shows that preference on fuelwood and timber differ significantly ($p < 0.05$) whereas that of other products is

insignificant ($p>0.05$) among economic classes. Thus, the first null hypothesis, the preference of FPs does not differ among economic classes, is rejected for fuelwood and timber whereas it is accepted in the case of fodder, leaf litter and NTFPs it is accepted.

Table 8: Preference of forest products for different classes in Kalobhir CF

	Fuelwood	Fodder	Timber	Leaf litter	NTFPs
Chi-Square	19.938	5.850	9.173	1.350	5.329
df	3	3	3	3	3
Sig. level	0.000*	0.119	0.027*	0.717	0.149
<i>a</i>	<i>Kruskal Wallis Test</i>				
<i>b</i>	<i>Grouping Variable: Economic class</i>				

*Significant at 5%

In *Bhitteripakha CFUG* also, the result from chi-square test is similar to that from Kalobhir. Where, preference on fuelwood and the timber is significant ($p<0.05$) whereas fodder, leaf litter and NTFPs are insignificant ($p>0.05$) among economic classes of the respondents.

Table 9: Preference of forest products for different classes in Bhitteripakha CF

	Fuelwood	Fodder	Timber	Leaf litter	NTFPs
Chi-Square	11.776	3.429	15.371	2.718	6.586
df	3	3	3	3	3
Sig. level	0.008*	0.330	0.002*	0.437	0.086
<i>a</i>	<i>Kruskal Wallis Test</i>				
<i>b</i>	<i>Grouping Variable: Economic class</i>				

*Significant at 5%

Furthermore, Table 10 shows the overall preference of the respondents by combining respondents of the two forests by economic classes. The statistical analysis shows that there is a significant difference ($p<0.05$) on preference in fuelwood, fodder, timber and NTFPs whereas insignificant only in case of leaf litter among economic classes.

Table 10: Preference of forest products in total sample of the study

	Fuelwood	Fodder	Timber	Leaf litter	NTFPs
Chi-Square	31.819	8.593	24.003	3.390	11.864
df	3	3	3	3	3
Asymp. Sig.	0.000*	0.035*	0.000*	0.335	0.008*
<i>a</i>	<i>Kruskal Wallis Test</i>				
<i>b</i>	<i>Grouping Variable: Economic class</i>				

*Significant at 5%

Therefore, null hypothesis is rejected except in case of leaf litter.

4.2.4 Economic value of major forest products

Economic value of fuelwood, timber and NTFPs were estimated by market price method as values of these products were available in local market. At the local market, values of fuelwood, timber and NTFPs were NRs 200/cubic feet, NRs 100/bhari and NRs 32-100/kg respectively. For valuing fodder which did not have market price was compared with the value of straw. One *bhari* of straw was equivalent to four *bhari* of fodder whose value was NRs 100/*bhari*, hence the value of fodder was determined NRs 25/*bhari*. Leaf litter which has neither market price nor substitute product, opportunity cost of time to travel and collect from the second nearest forest was calculated to estimate its value. The time spent was compared with wage rate of village which was NRs 50 per day (8 hours).

Table 11: Local and surrogate market price of the forest products

Forest Products	Unit	Local Market Price (NRs)	Surrogate Price
Fuelwood	<i>bhari</i>	100	-
Fodder	<i>bhari</i>		NRs 25/ <i>bhari</i> compared with value of (<i>Nal</i>) Straw = NRs 100/ <i>bhari</i>
Timber	Cuft	200	-
Leaf litter	<i>bhari</i>		Opportunity cost of time to travel and collect from second nearest forest (NRs 6.25 per hour)
NTFPs	Argeli (kg)	32-36	-
	Lokta (kg)	55-65	-
	Mushroom(kg)	100	-

Source: Focus group discussion and trader survey, 2007

4.3 Participation in decision-making and benefit from CFUG

4.3.1 Participation in decision-making

Decision-making in CFUGs is comprised of users' representation in the CFUGC, involvement in the program planning and implementation processes and benefits sharing processes. In this study, participation of users in decision-making processes, training/workshops tour and benefit sharing is studied. The results obtained are briefly explained under following topics.

4.3.1.1 Participation in general assembly and meeting

Participation of respondents in decision making process is studied in terms of their physical presence in General Assembly (GA)/meetings and involvement in discussion. For this, all the respondents were asked, whether or not they participated in GA and other meeting within one year period.

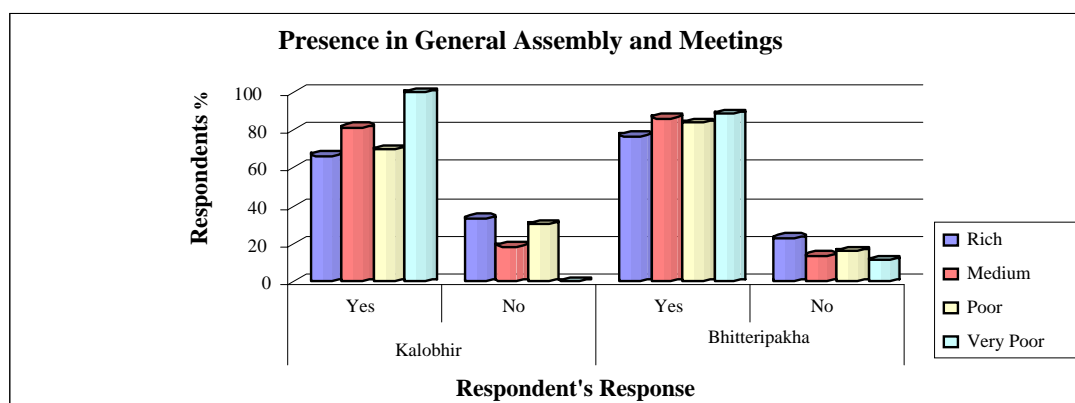
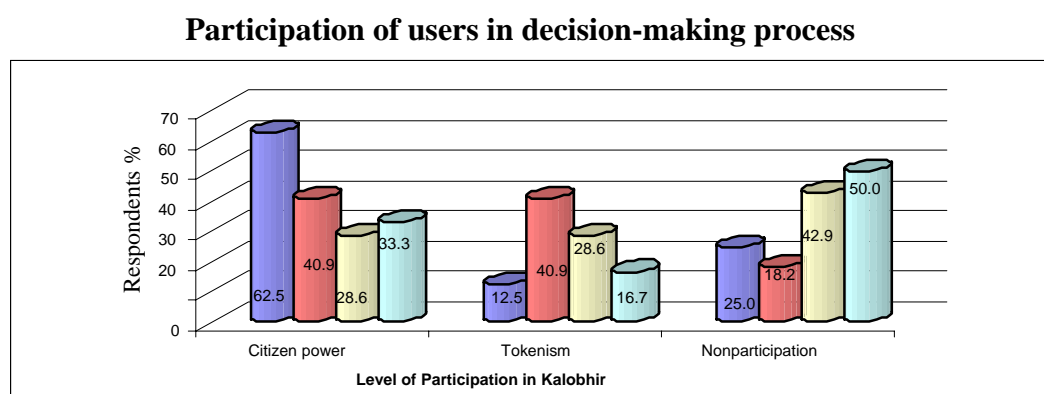


Figure 13: Presence in general assembly and meetings

Source: Household survey, 2007

In *Kalobhir CFUG*, around one-third of rich and poor household did not participate in GA and any meetings in past one year whereas all respondent of very poor were participated. In *Bhitteripakha CFUG*, around one forth of rich respondents mentioned that they did not participate in GA and any meeting whereas only around one tenth from other classes has mentioned that they did not participate.

Respondents of each CFUG who were present in GA/ meetings were then asked to rank their level of participation in decision-making process in three point ranking scale: citizen power, tokenism and non participation. In this study, decision-making process is participation of users in general assembly and other meetings and taking part in discussions.



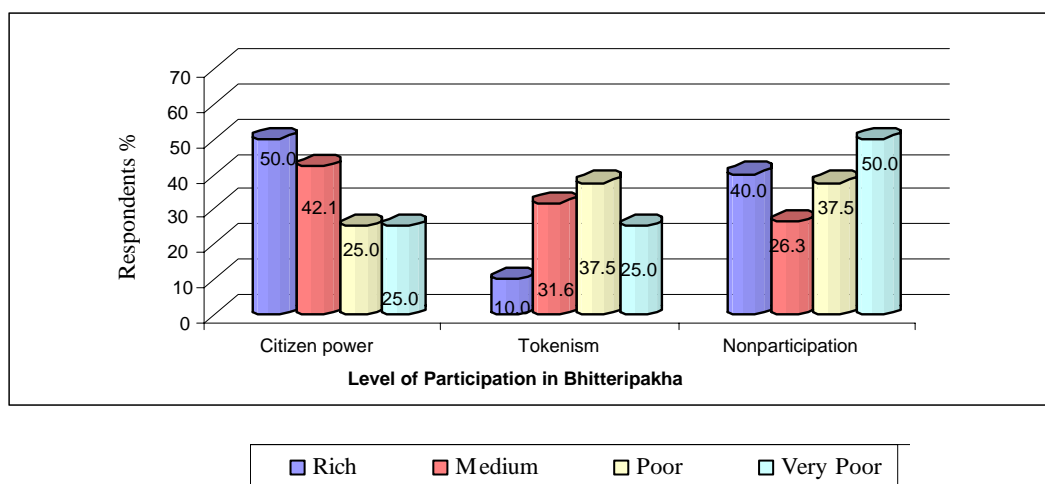


Figure 14: Participation of users in decision-making process

Source: Household survey, 2007

In both CFUGs, rich and medium households are actively participating in decision-making processes. Out of the total respondents, 62.5% and 50.0% respondents, from the rich class of Kalobhir and Bitteripakha respectively, mentioned their active participation in decision-making processes. In the case of medium class, it is 40.9% and 42.1% in Kalobhir and Bitteripakha respectively. Only one third of participation from poor and very poor classes participates in decision-making processes, which is low compared to the rich and medium classes. Most of the poor users of both CFUGs either remain passive or only participate moderately in decision-making processes whereas almost half of the participants from very poor of both CFUGs remain passive. Active participation of poor and very poor in Kalobhir is slightly higher than that of Bitteripakha.

4.3.1.2 Consideration of user's voice

All the respondents having citizen power and tokenism level of participation in decision-making process were asked how much CFUGC consider their voice in the process. Figure 15 shows that more than two-third respondents of rich and medium mentioned their voice is considered in decision-making process. In opposite to that, most of the respondents of poor and very poor from both CFUGs mentioned that CFUGC do not consider their voice in the process.

Consideration of voice of users' in decision-making process

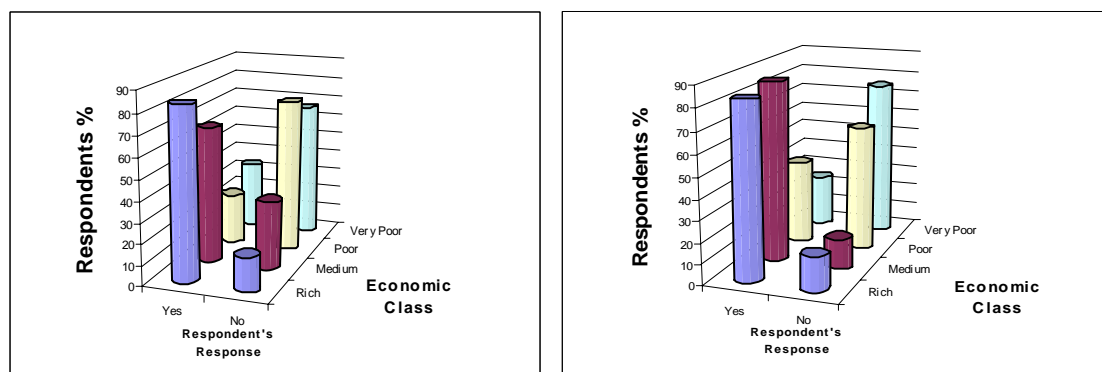


Figure 15: Consideration of users' voice decision-making process Source: Household survey, 2007

4.3.1.3 Participation of users in training/ workshop and tour

Participants of both CFUGs were asked whether or not they had an opportunity to participate in training/workshops and tours. In the case of Kalobhir CFUG, majority of rich and very poor classes had participated in the trainings and workshops followed by the poor class. There is almost equal level of participation of each economic class in training/workshops within CFUG, except the medium class in Kalobhir CFUG. The participation of medium class people in trainings / workshops and tour in Kalobhir CFUG is the lowest whereas that from Bhitteripakha CFUG is the highest.

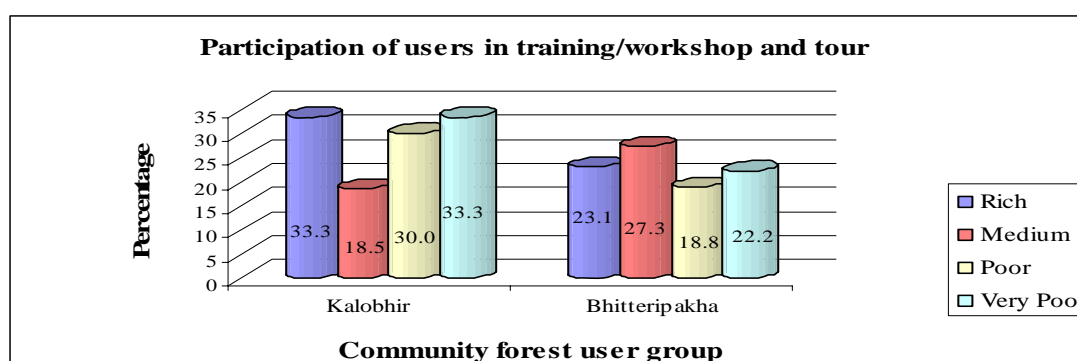


Figure 16: Participation of users in training/ workshop and tour Source: Household survey, 2007

4.3.1.4 Attitude of users towards forest management

Attitude of users is studied in three aspects of CF management: fund mobilization, benefit sharing and decision making. Respondents were asked for their opinion on above aspects in five points ordinal rating scale coded from 1.0 to 5.0 for strongly disagree to strongly agree respectively. Average value was calculated for each class and presented in spider diagram. Figure 17 shows that in both CFUGs attitudinal values for CF management of

medium and rich classes are high than that of poor and very poor. This means that they are more satisfied with CF management than poor and very poor classes.

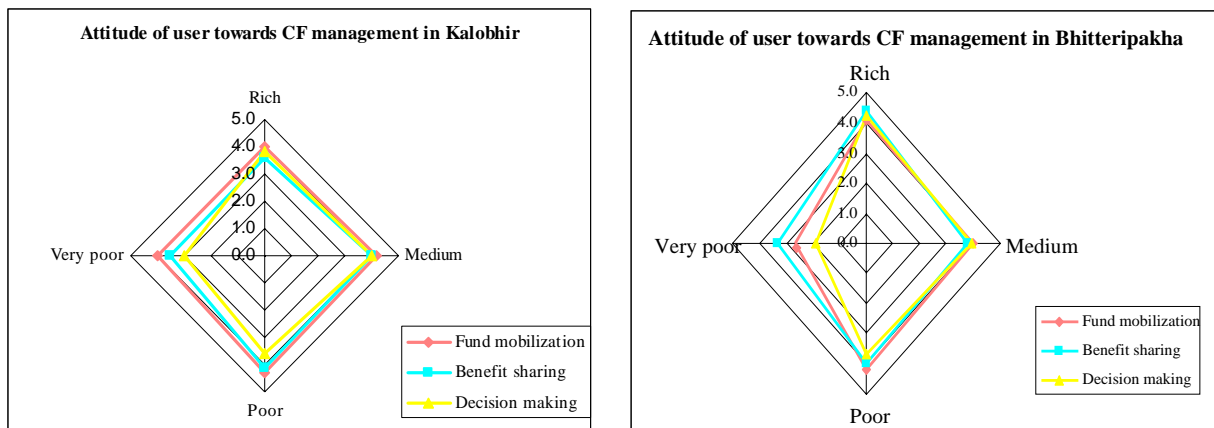


Figure 17: Attitude of users towards community forest management of Kalobhir and Bhitteripakha

In both CFUGs, average attitudinal values of very poor and poor classes for decision-making process are low, indicating that these classes are not satisfied with the decision-making process of the CFUG. However, within two classes average attitudinal value of the very poor for fund mobilisation was high in Kalobhir CFUG, whereas, the value in benefit sharing is high in Bhitteripakha. It shows that the very poor class of Kalobhir are more satisfied in fund mobilisation while in Bhitteripakha they are more satisfied in benefit sharing.

4.3.2 Forest product distribution mechanism and benefit from CFUG

Benefit sharing in this study is studied in terms of the forest product distribution mechanism, and distribution of commercial and subsistence forest products from CF. In addition, it also covers the income from different IGA supported by CFUG.

4.3.2.1 Forest product distribution mechanism

Every CFUG has their own constitution and operational plan (OP) as guiding documents for forest product distribution, and their executive committees are responsible for the implementation of these documents.

In the both CFUGs, they have provisions for distribution of each forest products. Distribution of timber is on need basis. Any household of the CFUG, which require timber for the purpose of house construction and renovation, can get timber after paying royalty as mentioned in OP. But the users cannot sell the timber to any person inside or outside the group. However, there is a special provision for poor users that they do not have to pay any royalty to get timber to construct or renovate their house. Furthermore, there is also a provision of providing timber at free of charge to victims of the natural hazards for house construction and blacksmith to make charcoal. In the case of surplus timber in CF, CFUGC decides the price and sale to outsiders but the price should not be less than that of the government royalty.

Fallen and dried wood which cannot be used as timber can be used as fuelwood and can be collected through out the year. In Kalobhir CFUG, to get such fuelwood, each household must pay NRs 25 to the CFUG annually. Cutting down green trees for fuelwood is prohibited except during silvicultural operations. The fuelwood obtained after the silvicultural operation is distributed to all of the users taking NRs 5 per *bhari* by giving seven days notice beforehand. There is no provision of any kind of fee for fuelwood in Bhitripakha CFUG. In addition, they are also not allowed to collect fuelwood from green standing trees. Users are allowed to sale fuelwood to local market and hand made paper enterprise. Many users are engaged in the collection and selling of fuelwood to run their livelihoods.

Kharshu is the main fodder species in both CFs which is prohibited for harvesting round the year. CFUGC is responsible for fixing and notifying the harvesting period to its users which lasts around six months, generally from December to May, when there is a scarcity of fodder in private land. At this time any household can go to the forest and harvest fodder free of charge.

Lokta, Argeli, Dhasingare, Allo, Mushroom, Chiraito, Lichen, Pine cone, Dhupi leaves, Pakhanbed, Majitho are major NTFPs of both CFs. CFUGs have set a ban on the collection and sale of few high value NTFPs, such as Lokta and Argeli without their permission. Lokta and Argeli are used as raw material for Nepali hand made paper. Users are only allowed to harvest these NTFPs during specified periods. The CFUGC is responsible to decide and inform to all users about the opening time to harvest these NTFPs. Users can harvest only during that time and can sell to any person or organization

in the presence of CFUG, and the CFUG take royalty from buyers. Another major NTFP called Mushroom is a seasonal NTFP which has a local market, but there is no any regulation mentioned about its collection and sale in OP. Thus, any user can collect and sell mushroom. However, the royalty rate is mentioned for some other NTFPs like, Chiraito, Lichens, Salla cone, Allo and Majitho. There is no clear rule and regulations existing to harvest and sale of NTFPs except Lokta and Argeli. In practice, the CFUG takes royalty from other NTFPs too.

4.3.2.2 Benefits from community forest

The Forest Act 1993 and Forest Regulation 1995 has given full authority to CFUGs to manage and utilise forest resources according to their OP. CFUG can fix the price of their forest products and distribute within the group irrespective of the government royalty rate. Furthermore, it can collect revenue from those forest products which are sold out of the group. For this, the royalty rate must not be less than that of the government. Whatever the money CFUG generates from different sources goes to its collective fund. There is a mandatory provision in Community Forestry guidelines that the CFUG has to spend 25% of its income in CF development activities whereas remaining funds can be spent on community development activities. CFUGC, with the approval of the general assembly, is responsible for allocating and investing of its fund in different community development programmes, including pro-poor programmes.

Kalobhir CFUG, with their internal fund and also in coordination with other GO and I/NGOs, is conducting various pro-poor programs. It has invested a total of NRs 22500 in potato cultivation program covering 13 poor and very poor households. The money they receive must be paid back to CFUG within two years through potato sales; and this money will then be provided to other interested poor users. They have also supported five very poor users for goat farming by providing NRs 2000 for each. CFUG has also provided NRs 300 per year as scholarships for three girl students from three very poor households. In addition, they have also provided NRs 200 for four very poor users to improve their fuelwood ovens and also provided NRs 2000 to a user for ginger cultivation. Likewise, there was a provision of fund for those households who were willing to construct toilets.

NSCFP has granted NRs 5000 each to 19 very poor users in order to purchase share in Nepali hand made paper enterprise and also trained interested very poor users to make paper. Three very poor users are engaged in paper enterprise.

Box 1: Income generation activities (IGA) in Kalobhir CFUG

Ms Kanschi Maya Jirel, 70, is very poor user of Kalobhir CFUG. In her family, she is accompanied with her husband. She is taking responsibility of running her family as her husband is old and most of the time remains drunk. She has very limited sources of income. Last year she asked help from Kalobhir CFUGs,



as

she was searching extra source of income. The CFUG had decided to support her in goat farming and provided NRs 2000. With this, she purchased two female goats last year. In period of one year, she was able to sale two goats in NRs 3400 and now has two more baby goats with mother goats intact. She was very satisfied with the CFUG support as she was able to earn money in short time and according to her goat farming is not so difficult. Now she is going to pay back the CFUG loan soon.

Source: Household survey, 2007

Bhitteripakha CFUG has also supported NRs 4858 for seven poor and very poor households for potato cultivation in 2006/2007. In addition, three users were provided NRs. 5000/ person for poultry farming with a support from NSCFP, a project working in that area. Likewise, ten poor and very poor class users were granted NRs 2000 each for improved cattle farming. All these supports were conditional, and users must pay back the loan within three years after they start to get benefits.

In addition to the above support, there are also other pro-poor programs; among them are investment on share in essential oil distillation enterprise and Nepali hand made paper for five and two very poor users respectively. NSCFP has provided financial support of NRs 5000 for each user for the former program while the CFUG itself invested NRs 1000 each for the latter. Other benefits are employment of the poor in oil distillation and hand made paper enterprise. For forest development work and harvesting of timber, CFUG previously employed poor users. Last year, 30 users were involved in timber harvesting for 30 days at the rate of NRs 100 per day. CFUG has allocated piece of foest lsnd for

ginger, potato and NTFPs cultivation as pro-poor program though it is not defined in the CF legislation.

Box 2: Bhitteripakha CFUG support very poor HH



Pashang Tamang, 48 unmarried is accompanied with his older brother. They are only two in their family. They have only 0.05 ha of land and production of that is hardly meets the food requirement of one month. For rest of the period of year, they have to

depend on labor work. They also have two goats, few hens and one cow. With all these sources of income, they are hardly managing their livelihood. Sometime, they have to even sleep with empty stomach. At this situation, renovation of their house was just impossible. It was hardly possible to sleep inside the house in rainy reason because of excessive roof leakage. CFUG noticed their problem and decided to support them corrugated sheet for roofing. These two brothers are now very happy with CFUG.

Source: Household survey, 2007

In this study, benefit from CFs is studied in terms of cash income and use of subsistence products. Cash income covers all income from selling fuelwood, NTFPs, and worked as labour in harvesting timber. In addition, it also includes income from forest based enterprise and IGA programs supported by the CFUG. Subsistence products are timber, fodder and leaf litter whereas fuelwood is used for both purposes. To calculate the benefit from fuelwood, quantity sold and used as subsistence is separated and calculated accordingly. Values of all forest products for subsistence use are calculated using different methods. The *surrogated pricing* method is used to estimate the value of fodder whereas the *market price* method is used to estimate the price of timber, fuelwood and NTFPs. Value of leaf litter is calculated using the *opportunity cost* method as it does not have any substitute product.

In *Kalobhir CFUG*, Table 12 shows the share in average benefit of each class from forest products in Kalobhir CFUG. It shows different patterns of sharing in cash and subsistence benefits. The share of poor, very poor and rich in the case of income from commercial product from CF is high (45%, 21% and 21%, respectively) whereas the share of medium

classes is 13%. In contrast to this, the share of the poor and very poor in subsistence benefit is less than that of the rich and medium classes.

Table 12: Share of community forest benefit

Economic Status	Kalobhir CFUG			Bhitteripakha CFUG		
	Cash Income (%)	Subsistence Income (%)	Total Income (%)	Cash Income (%)	Subsistence Income (%)	Total Income (%)
Rich	20.9	29.6	26.0	10.6	28.8	23.7
Medium	13.0	33.5	25.1	17.0	32.0	27.8
Poor	45.1	21.5	31.2	49.1	25.1	31.8
Very Poor	20.9	15.4	17.7	23.3	14.2	16.7

Source: Household survey, 2007

The medium class has a higher share in subsistence income from CF. It shows that dependency of the poor and very poor classes in CF for cash income is high. In total income of CF, poor has the highest share followed by rich/medium class whereas the very poor has the lowest share. This clearly indicates that poor are more dependent on the forest for their income than rich and medium classes. However, very poor are least depends or more specifically to say they are not able to cash the CF benefit.

In case of *Bhitteripakha CFUG*, as in Kalobhir CFUG, the poor class has the highest share (49%) in cash income from CF, followed by the very poor (23%), while the rich class has the least share. Furthermore, the share of different classes in subsistence benefit is not clearly distinct compared to that in cash benefit. Nevertheless, medium class has the highest share followed by rich and poor.

In this CFUG too, poor and very poor households are more depended on CF for cash income. In addition, poor are the households who have highest share in total income from CF, followed by medium/rich and very poor classes. The poor class not only has the highest share in cash income, but also in overall income of CF. However, the share of very poor in total CF income is the lowest as in Kalobhir CFUG.

4.3.2.3 The annual benefit cost at household level

For benefit cost analysis, values of all major forest products; timber, fuelwood, fodder, leaf litter and NTFPs and benefit from IGA were calculated. The cost comprised of time

spent for harvesting and transporting of forest products, time spent in institutional development activities (meetings) and forest development activities (silviculture work).

In *Kalobhir CFUG*, benefit from forest product harvest is more than double the cost involved for all classes. Among four classes, rich has the highest ratio followed by poor which means that return on investment of the rich class is the highest and that of medium and very poor class are least.

Table 13: Economic class wise benefit cost ratio in Kalobhir CFUG

Economic class	Benefits (NRs)	Costs (NRs)	Benefits @ (NRs) 100 Cost	Net Benefits (NRs)	B/C Ratio
Rich	20375	9771	236	10604	2.36
Medium	20414	9881	217	10533	2.17
Poor	23123	10104	232	13020	2.32
Very Poor	13605	6498	203	7107	2.03

Source: Household survey, 2007

In *Bhitteripakha CFUG*, benefit cost ratio is the highest (2.58) for poor class and the lowest (1.78) for very poor class followed by medium class. As medium and very poor have a lower benefit cost ratio, it means that their return on investment in CF is low compared to that of rich and poor classes.

Table 14: Economic class wise benefit cost ratio in Bhitteripakha CFUG

Economic class	Benefits (NRs)	Costs (NRs)	Benefits @ (NRs) 100 Cost	Net Benefits (NRs)	B/C Ratio
Rich	12078	6158	240	5920	2.40
Medium	21234	9318	233	11916	2.33
Poor	16465	7395	258	9070	2.58
Very Poor	9795	5543	178	4252	1.78

Source: Household survey, 2007

4.3.2.4 Cost and value of unit forest products

The market prices of timber, fuelwood and (wheat/millet) straw are same in both CFUGs so, their unit values are also same in both cases. Unit value of NTFPs and leaf litter is slightly different as market price and distance of second alternative forest are different. In both cases unit cost of timber is almost half of its unit value. Furthermore, unit cost of fuelwood was one fourth of its unit value. Unit costs of all the forest products are higher

in Bhitteripakha than Kalobhir except fuelwood. Likewise, unit value of NTFPs and leaf litter is also high in Bhitteripakha CFUG.

Table 15: Cost and value of unit forest products

Kalobhir CFUG			Bhitteripakha CFUG		
Forest Product	Unit Cost (NRs)	Unit Value (NRs)	Forest Product	Unit Cost (NRs)	Unit Value (NRs)
Timber	112	200	Timber	115	200
Fuelwood	25	100	Fuelwood	22	100
Fodder	19	25	Fodder	20	25
NTFPs	22	42	NTFPs	26	43
Leaf litter	19	25	Leaf litter	20	28

4.4 Contribution of CF in household income & in inequality measures

4.4.1 Contribution of CF on total household income

This section describes the contribution of cash and subsistence income from CF in total household income of users. For this study, total household income is disintegrated in following income sources; agriculture, livestock, off-farm and both cash and subsistence incomes from CF. Average income for each source were calculated for all classes.

4.4.1.1 Sources of income of different economic classes

In both CFUGs rich class has dominated in agriculture and off farm income. Furthermore, difference in income among economic classes is the highest in off farm income. However, medium class has the highest income in livestock income in the Kalobhir CFUG whereas in the Bhitteripakha CFUG rich class again has the highest income. In both CFUGs, poor has dominated in income from CF while very poor has the lowest income in all sources.

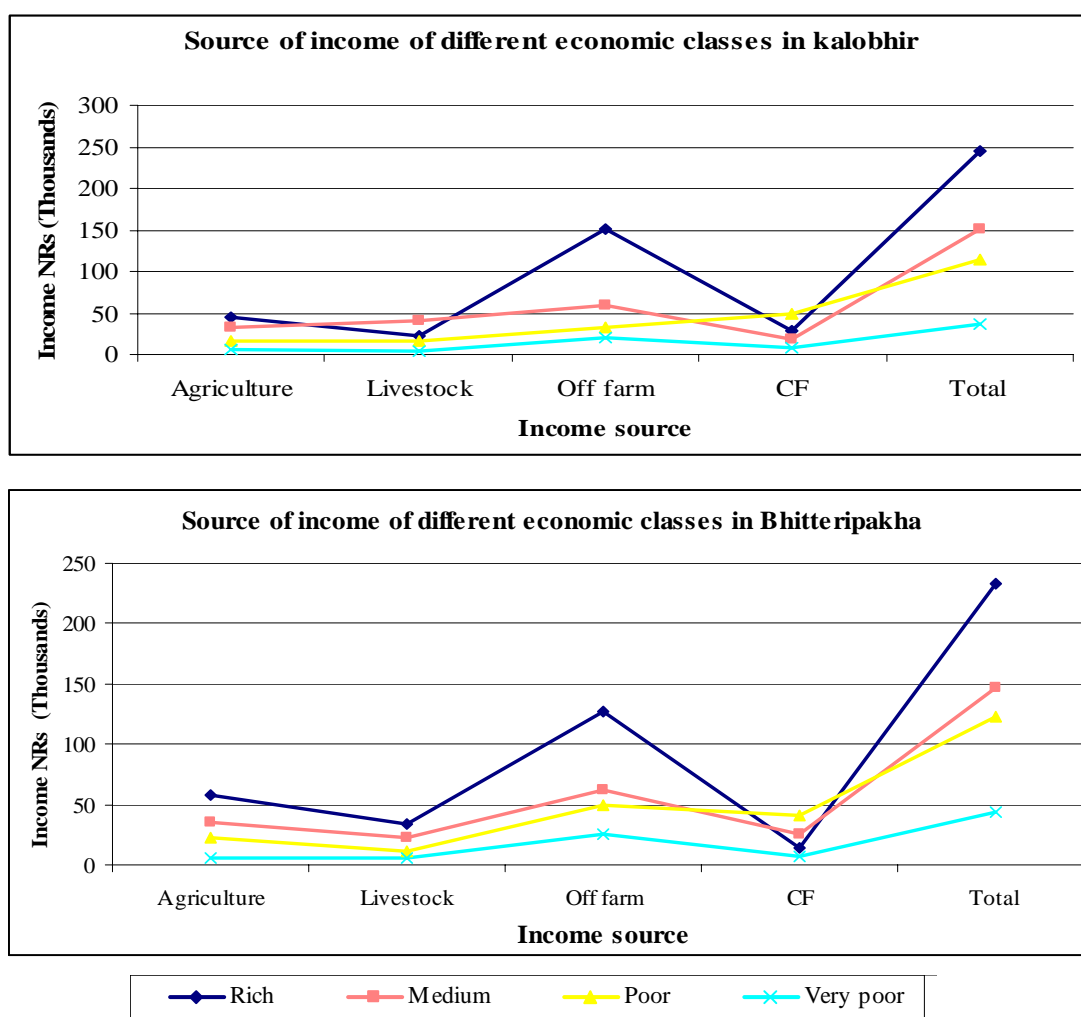


Figure 18: Source of income of different economic classes

Source: Household survey, 2007

Table 16 shows the different sources of income and its distribution within different economic classes. In Kalobhir CFUG, it shows that there is high deviation in forest income for the rich household followed by the poor and medium. In compare to other economic class very poor has less income difference. Whereas, in Bitteri CFUG, there is high deviation in the forest income for the medium and poor followed by the rich and the very poor.

Table 16: Source of income of different economic classes

Source of income of different economic classes									
		Kalobhir CFUG				Bhitteripakha CFUG			
		Mean	SD	Min	Max	Mean	SD	Min	Max
Agriculture	Rich	41417	31288	16000	133500	58308	27503	21000	105500
	Medium	32626	13927	10500	74400	35859	12077	18400	59600
	Poor	15840	5032	10000	27000	20750	7937	6000	35000
	Very Poor	5250	2856	2400	10500	11644	5531	1600	16800
	Total	28505	20811	2400	133500	33062	21917	1600	105500
Livestock	Rich	9583	5518	0	22000	21308	12345	5000	40000
	Medium	11333	4810	0	21000	13227	7158	3000	27000
	Poor	8200	1687	6000	11000	8763	6602	0	24000
	Very Poor	3500	1265	2500	5500	5467	4986	500	17000
	Total	9527	4895	0	22000	12623	9607	0	40000
Off Farm Activities	Rich	150667	90346	24000	300000	126538	39972	80000	200000
	Medium	59863	36377	7500	150000	62636	45739	10000	250000
	Poor	31950	27064	6000	100000	49500	27979	20000	120000
	Very Poor	20667	8914	12000	36000	25378	16961	0	48000
	Total	70324	66821	6000	300000	67390	49426	0	250000
Forest	Rich	20583	17568	5000	66850	12516	7435	4000	32375
	Medium	21807	14659	5000	78525	17307	12261	6425	63063
	Poor	27560	16851	6250	51000	22052	12541	11313	54563
	Very Poor	15477	9504	6000	32500	13146	5467	7050	21150
	Total	21896	15262	5000	78525	16910	11065	4000	63063

(Note: Min: minimum, Max: maximum, SD: standard deviation)

Source: Household survey, 2007

4.4.1.2 Share in total cash income and CF cash income

In both CFUGs, more than 50% of total cash income within the community goes to the rich class followed by the medium class. Very poor household has only about one-tenth share in overall cash income of community. However, in both CFUGs, share in total CF cash income of poor was the highest followed by very poor. In the Kalobhir, the medium class has least share in CF cash income whereas in Bhitteripakha the rich has least share. It shows that, though the poor and very poor classes have very less share in total cash income of community but they have more shares in CF cash income.

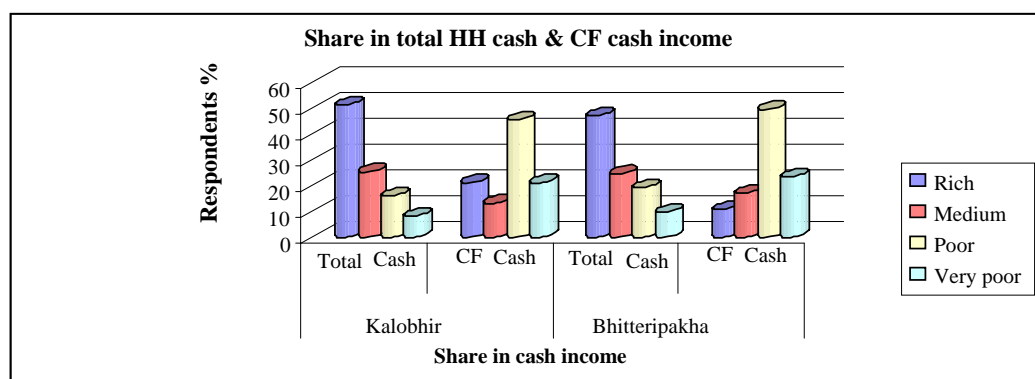


Figure 19: Share in total HH cash and CF cash income

Source: Household survey, 2007

4.4.1.3 Share of CF income in total household income

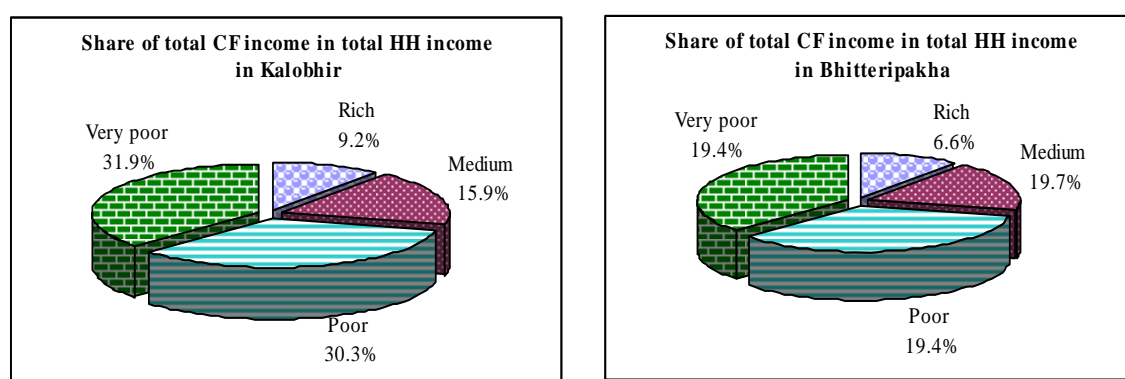


Figure 20: Share of CF income in total household income

Source: Household survey, 2007

Figure 20 shows, in both CFUGs, contribution of CF income in total household income is the highest in poor and very poor classes. In the Kalobhir, CF income covers almost one-third of total household income of both the poor and very poor classes whereas in Bhitteripakha, it covers almost one-fifth of total household income. Furthermore, in both CFUGs, there is least contribution of CF income to the total income of the rich class. It implies that dependency on CF increased as economic status decrease.

4.4.2 Income distribution and inequality measures

Both Lorenz curve and Gini coefficients are used to show the income inequality among the sampled households. The Gini-coefficient is a number between 0 and 1, where 0 corresponds with perfect equality (where everyone has the same income) and 1 corresponds with perfect inequality (where one person has all the income, and everyone else has zero income).

Figure 21 represents the Lorenz curves for the households' income of both CFUGs when the community forest income is included and excluded in the total household income. The inner curve (towards the line of equality) represents the results when total CF income is included, the middle curve represents when only CF cash income is included, and the outer curve (away from the line of equality) represents the results when the community forest income is excluded from total household income. Figure 21 shows, in both CFUGs, curves are closer to the line of equity when CF cash income is included in total household income. Furthermore, they are more close to the line of equity when total CF income is included in total household income.

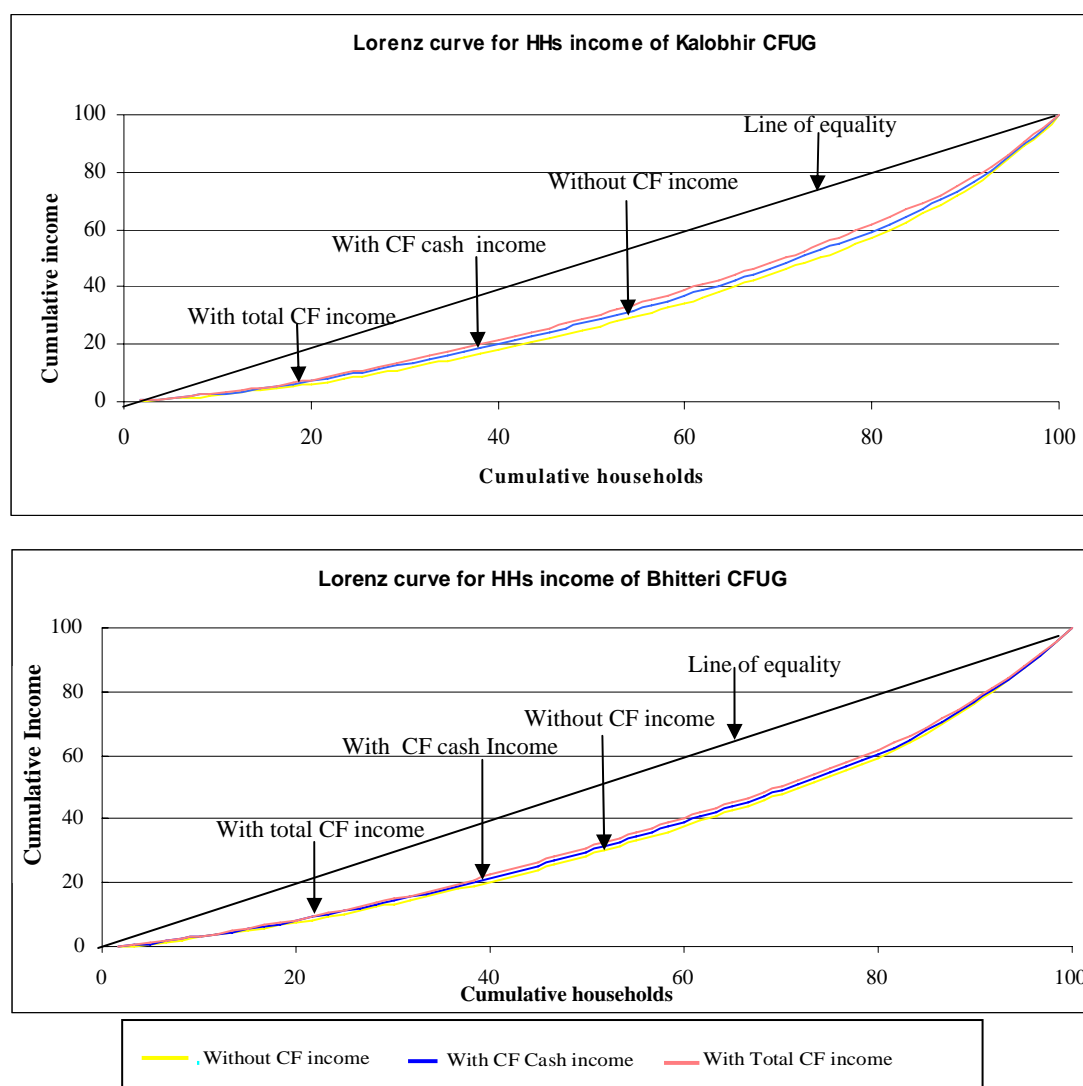


Figure 21: Lorenz curve for HHs income

Source: Household survey, 2007

The Gini-coefficient is often defined from the Lorenz curve, but also can be defined directly. In this study it is defined directly by using the formula. The national Gini-coefficient of Nepal is 0.49 (FAO, 2004) whereas that of both CFUGs have quite low

than that. So, it can be said that there is low income inequalities within different classes' households in comparison to the national level.

Table 17: Gini-coefficient of two CFUGs

CFUG	Without CF income	With CF cash income	With total CF income
Kalobhir	0.36	0.32	0.30
Bhitteripakha	0.32	0.30	0.28

Hence, it implies that inclusion of CF income in the total household income helps in reducing the income inequalities among the households. These values of Gini-coefficients or the departure of Lorenz curves from the line of equality (figure 21) clearly indicate the community forest income helps in reducing the income inequalities among the sampled households.

4.4.3 Measures of income with different variables

Table 18: Chi-Square with grouping variable economic class

		CF cash income	CF subsistence income	Total CF income	Income with CF cash income	Income with total CF income
Kalobhir CF	Chi-Square	13.43	6.82	3.25	29.45	31.22
	df	3	3	3	3	3
	Sig. level	0.004*	0.078	0.355	0.000*	0.000*
Bhitteripakha CF	Chi-Square	9.22	9.22	38.89	40.75	17.99
	df	3	3	3	3	3
	Sig. level	0.026*	0.026*	0.000*	0.000*	0.000*
<i>a</i>		<i>Kruskal Wallis Test</i>				
<i>b</i>		<i>Grouping Variable: Economic class</i>				

*Significant at 5%

In case of Kalobhir CFUG, Table 18 shows that CF cash income and total income with total CF income among different classes is significant ($p < 0.05$). Income from subsistence forest product is only significantly different at $\alpha = 10\%$ whereas total forest income is insignificant among different classes.

As in Kalobhir CFUG, in Bhitteripakha CFUG also the result shows that CF cash income, CF subsistence income, total CF income, total income with CF cash income and total income with total CF income among different classes are significantly different ($p < 0.05$).

Table 19: Chi-Square Test in total sample with grouping variable economic class

	CF cash income	CF subsistence income	Total CF income	Income with CF cash income	Income with total CF income
Chi-Square	27.57	15.28	10.35	68.09	70.16
df	3	3	3	3	3
Sig. level	0.000*	0.002*	0.160	0.000*	0.000*
<i>a</i>	<i>Kruskal Wallis Test</i>				
<i>b</i>	<i>Grouping Variable: Economic class</i>				

*Significant at 5%

Table 19 shows the analysis of variance in total sample (n=115) of the study. The results shows that, there is significant ($p < 0.05$) different in all categories of income; CF cash income, CF subsistence income, total income with CF cash income, total income with total CF income but it is insignificant ($p > 0.05$) in total forest income. With this, the second null hypothesis, there is no significant difference in the share of CF benefit among different economic classes, is rejected.

Table 20: Chi-Square with grouping variable caste

		CF cash income	CF subsistence income	Total CF income	Income with CF cash income	Income with total CF income
Kalobhir CF	Chi-Square	3.77	2.15	3.14	3.98	3.90
	df	2	2	2	2	2
	Sig. level	0.152	0.342	0.208	0.136	0.142
Bhitteri CF	Mann-Whitney U	371.5	390.5	395.5	396.0	396.0
	Wilcoxon W	1191.5	1210.5	605.5	606.0	606.0
	Z	-0.469	-0.149	-0.071	-0.071	-0.157
	Sig. level					
	(2 tailed)	0.639	0.882	0.944	0.950	0.875

a *Kruskal Wallis Test & Mann-Whitney U Wilcoxon W*

b *Grouping Variable: Caste*

*Significant at 5%

In case of Kalobhir CFUG, table 20 shows that all composition of income is insignificant ($p > 0.05$) among castes. Similarly, in case of Bhitteri CFUG, being the grouping variable only two, Kruskal Wallis Test is used which shows also there is insignificant difference ($p > 0.05$) in all composition of income according to caste.

Table 21: Chi-Square test in total sample with grouping variable caste

	CF cash income	CF subsistence income	Total CF income	Income with CF cash income	Income with total CF income
Chi-Square	2.15	0.14	0.67	0.45	11.56
df	2	2	2	2	2
Sig. level	0.342	0.933	0.716	0.800	0.003*
<i>a</i>	<i>Kruskal Wallis Test</i>				
<i>b</i>	<i>Grouping Variable: Caste</i>				

*Significant at 5%

Table 21 shows the analysis of variance in total sample of the study with the dependent variable caste. The results shows expect in total CF income the cast has no significant difference ($p>0.05$) in all other composition of incomes.

Table 22: Mann-Whitney test with grouping variable household head in two CFUGs

		CF cash income	CF subsistence income	Total CF income	Income with CF cash income	Income with total CF income
Kalobhir CF	Mann-Whitney U	114	171	153	161	160
	Wilcoxon W	1450	1299	189	1289	1288
	Z	-1.82	-0.42	-0.84	-0.64	-0.68
	Sig. level (2 tailed)	0.068	0.676	0.403	0.519	0.496
Bhitteripakha CF	Mann-Whitney U	169	227	168	244	244
	Wilcoxon W	1444	1502	1443	299	299
	Z	-1.69	-0.46	-1.63	-0.12	-0.02
	Sig. level (2 tailed)	0.092	0.648	0.104	0.905	0.984
<i>a</i>	<i>Grouping Variable: Household head</i>					

*Significant at 5%

Individual statistical analysis with the dependent variables household head shows that difference in all composition of incomes are insignificant ($p>0.05$).

Table 23: Mann-Whitney test with grouping variable Household head in total sample

	CF cash income	CF subsistence income	Total CF income	Income with CF cash income	Income with total CF income
Mann-Whitney U	870	801	793	827	808
Wilcoxon W	1041	5554	5546	5580	5561
Z	-0.02	-0.56	-0.62	-0.35	-0.50
Sig. level (2 tailed)	0.981	0.577	0.538	0.724	0.614
<i>a</i>	<i>Grouping Variable: Household head</i>				

*Significant at 5%

Furthermore, the analysis of variance in total sample (n=115) shows that the household head has no significant difference ($p>0.05$) in all composition of income.

4.4.4 Per capita income of individual

Per capita income is the annual income of an individual. In both CFUGs, per capita cash income from CF is the highest for the poor class. It is the lowest for the medium class in Kalobhir CFUG whereas in Bhitteripakha CFUG it is the lowest for the rich class. In case of total CF income, it is the highest for the poor and the lowest for the very poor in both CFUGs.

Table 24: Per capita income by economic class of Kalobhir & Bhitteripakha CFUG

Per capita income										
Economic class	Kalobhir CFUG					Bhitteripakha CFUG				
	Total income (NRs)	Total income per day (US \$)	CF cash income (NRs)	CF total income (NRs)	CF income per day (US \$)	Total income (NRs)	Total income per day (US \$)	CF cash income (NRs)	CF total income (NRs)	CF income per day (US \$)
Rich	45931	1.94	1388	4207	0.18	39834	1.68	326	2612	0.11
Medium	23973	1.01	812	3806	0.16	21446	0.90	485	2825	0.12
Poor	14345	0.60	2580	4346	0.18	17308	0.73	1479	3416	0.14
Very poor	8640	0.36	1340	2757	0.12	10312	0.43	780	1999	0.08

Source: Field data, 2007

In both CFUGs, poor has higher per capita per day income from total CF whereas that of very poor is least.

Chapter 5: Discussion

Community forestry is considered to be one of the most important programmes in Nepal in terms of reducing poverty and providing equitable distribution of forest resources. Since the beginning of 1990, Nepal's plan has focused on poverty reduction aspect of development through integration of various programmes within the forestry sector. The ninth (1997-2001) and tenth (2002-2006) five-year plans have emphasized more on this aspect. In this chapter, the preferences different economic classes for various forest products for, participation of users in different CF activities and the contribution of CF to household income are discussed.

5.1 Preferences for forest products

Many studies have shown that the variation in household economy is associated with difference of interest in the use of the FPs among users ([Adhikari, et. al., 2004](#) and [Poudel, 2003](#)). In this study also, majority of the rich class has preferred timber followed by medium class (Figure 10 and 12). Although, in both CFUGs there is a provision of providing timber for very poor class without taking any fee, timber is a low priority for them. The very poor class is unable to construct big houses which required more timber and their houses are generally small hut type. Despite of having the special provision on timber, they are deprived from getting benefit from this. It was observed that as economic status improves the preference on the timber also increased, showing a positive relationship between the preference and the economic class.

Fuelwood is preferred by all economic classes, none of the users except a few from the rich class have low preference. Despite various degrees of forest product dependency, all economic classes' rely on fuelwood for their daily livelihood ([Adhikari et. al., 2004](#)). Particularly in the mid-hills, 94% of rural households rely on fuelwood as primary fuel for cooking and heating ([Edmonds, 2002](#)). Fuelwood is not only important to household for cooking but also for protecting them from cold. Generally, poor and very poor household do not have sufficient money to invest in warm cloths for winter and hence use more fuelwood to make themselves and their children warm. Furthermore, fuelwood is also one of the major sources of cash income in both CFUGs. As Kalobhir CFUG is very close to Jiri, the second largest market of the district, there is high demand for fuelwood in hotels and private houses. Likewise, in both CFUGs, there is a paper making company which consume considerable amount of fuelwood. Generally, users from both poor and

very poor classes are engaged in trading of fuelwood which has considerably positive impact on their livelihoods.

NTFPs collection is the most important rural livelihood strategy mainly for poor people. The poorest part of the Nepal hill population depends on NTFPs for income generation and subsistence use. Up to 50% of rural households' income is derived from commercial collection of NTFPs (Edwards, 1996). Usually, those users who don't have alternative cash income for their basic need fulfillment are found to be highly dependent on its collection, processing and trading. In this study, it is found that the poor and very poor respondents have the most preference for NTFPs except the very poor of Bitteripakha. These respondents are generally engaged in harvesting of Argeli, Lokta, Chiraita, mushroom and other NTFPs. In Kalobhir, as the market is very close they have easier market access for the collected mushrooms than in Bitteripakha. Not only that, but also Mushroom is easy to collect than Argeli and Lokta which attract old and disabled people also. In one study of mushroom collection in Nepal, Christensen et al., (2008) has also reported that mostly the poor are engaged in commercial trading of mushroom.

Another reason for being a high preference of NTFPs for the very poor class of Kalobhir could be because these users are getting profit out of their share in a Nepali hand made paper company whereas none of the shareholders of a paper company of Bitteripakha are getting a profit out of their share. The middle class has a medium preference for NTFPs in both CFUGs as they are mostly involved in agriculture activities and very few are engaged in NTFPs collection and trading.

Regarding preference for fodder, almost all classes have more or less equal preferences. However, none of the rich from Bitteripakha and very few from Kalobhir mentioned it as a highly preferred product (Figure 9 and 11). The rich class people have their own land for the fodder so they do not have to depend totally on CF (Paudel, 2003; Adhikari, 2004). Moreover, few rich households are engaged in business and don't have any livestock hence, for them, fodder is of no use. Medium class households are most needy of fodder, as they have relatively less land for fodder and high a number of cattle. Hence almost one-third of respondents from the medium class mentioned it as highly preferred product (Figure 9 and 11).

Leaf litter is generally used as bedding material for livestock and also for preparing compost manure for agricultural land. In both CFUGs rich, medium and poor classes have

the greatest preference for leaf litter. Among them medium households have the highest preferences. The major occupation of medium class households is agriculture and livestock farming hence the requirement for more leaf litter. Although the poor class has less landholding and livestock but they used to rent the land and cattle from richer households. Therefore they also required a high quantity of leaf litter. The very poor have less quantity of both land and fewer livestock so they require a less quantity of leaf litter and the preference is also the lowest.

5.2 Participation and decision-making process

Participation is one of the indicators to measure performance of CFUG. Active participation of maximum users, in every activity of CF, develops a sense of ownership feeling and is also an indicator of how successful the CF management is. Guidelines for the Community Forestry Development Programme, 1996 have also emphasised the importance of participation of local people in all activities of CFUG. Participation, in its true meaning, is not only physical presence but also of stakeholders but also the active involvement of each individual stakeholders in decision making.

In both CFUGs, throughout 2006 to 2007, presence of the rich and medium class was less in GA and meetings. However, in both CFUGs, active participation, that is, participation at Citizen Power level is the highest for the rich class followed by the medium class. Approximately 50% of the poor and very poor remained quiet in GA and meetings (Figure 13 and 14). On an average, respondents show a greater degree of participation in forest protection and resource utilization than in decision-making (Chhetri, 2005). Like many studies regarding participation in CFUG (Hobely, 1996; Gauli and Parul, 2004), this study also found that the participation of the majority of the poor is limited to only being observers of the process.

In group discussions and also in informal talks, some of the poor class users had expressed their dissatisfaction with CFUGC members regarding their role in the decision-making process. CFUGCs are mostly dominated by the rich class of people. They want to put their agendas first in meetings and that of poor users seldom become important for them (Thoms, 2008). The result (Figure 15) also shows that more than two-third of the poor and very poor users who used to speak in GA and meeting reported that CFUG do not consider their voice and hence they are disinterested in active participation. Baral (2001), Uprety (2003), and Uprety (2005) argued that the participation of the very poor

and others marginalized groups in community forestry in Nepal can be called as tokenism. Participation of people is just as a physical presence one and the poor users are deprived of emotional and psychological attachment to the use and management of forest resources (Timilsina, 2002)

Though there is high domination of the rich class in CFUG's GA and meetings, there is not much variation in the level of participation among different classes in training/workshops and tours (Figure 16). Generally, these programmes were organized by I/NGOs and GOs, who try to ensure the participation of the poor class people. Frequent participation of the poor users in these programs has improved their confidence levels to speak in-front of people. This has reflected in their level of participation in GA and meetings, as few respondents have mentioned citizen power level of participation.

5.3 Attitude towards Community Forestry activities

The way CFUGC treat users or users behave with CFUG leaders and towards CF activities are determined by their belief and feeling about each other and the benefit they are getting from the CF. All the actions of users are directed by their attitudes. In this study, it is found that the poor have do not have positive attitudes towards the decision-making process. Moreover it is more negative in Bhitteripakha than Kalobhir (Figure 17). Their attitude towards decision-making is shaped by their presence and interaction in GA and meetings. As elite members of the community dominate the decision-making forum, the voice of poor people is seldom heard. The very poor users show a more positive attitude towards fund mobilization in Kalobhir whereas they have shown more positive attitudes towards benefit sharing in Bhitteripakha. The rich and medium classes of both CFUGs have more positive attitude towards all aspects of the CFUGs functionality. This could be because these classes of people are more involved in activities of CFUGs and have more information regarding thier function. A study carried out by Gauli (2003), in four CFUGs of the Terai region of Nepal, also found that the attitude of poor class people was least positive as they were having less opportunity to involve themselves in decision-making and benefit sharing activities.

5.4 Benefit sharing of Community Forestry

In both CFUGs, users are getting direct and indirect benefit from CF. Direct benefits are all cash and subsistence benefits from CF whereas indirect benefits are mainly benefits from the IGA programme supported by or through CFUG. Users are getting cash incomes from selling NTFPs, fuelwood and involvement in forest based enterprises. Users are

getting subsistence products for HH consumption. [Ray et al., \(2002\)](#) mentioned that direct and indirect benefits from community forestry have played a great role in the social life of the people.

The study shows that in both CFUGs, the poor has the highest share in cash income (significant @ 5%) from CF. This is because, the poor in both CFUGs are more involved in cash earning activities of CF. Those activities are collection and sale of fuelwood, NTFPs and labor work in timber harvesting for richer households. As poor people do not have many options for cash income, their dependency in CF is high. They are earning cash from harvesting and processing of NTFPs, mainly Lokta and Argeli. Both CFUGs have hand made paper manufacturing companies, where poor and very poor people are employed. The employment is labour intensive that suits the low skill profile of poor users ([Acharya, 2005](#)). In subsistence benefit from CF, the medium class has the highest share whereas the rich and poor have almost equal shares. It is because the medium class is mostly involved in agricultural activities having relatively good land holding and livestock holding. The medium class harvest more fodder for livestock and leaf litter for composting. The rich HHs are also less depends on fuelwood as few of them use liquified petroleum gas and kerosene as cooking fuel.

For total benefit from CF, the poor has the highest share followed by the medium/rich. It indicates that the poor have the highest dependency on CF for running their livelihoods. The very poor users are getting least benefit from subsistence products. Their involvement is found in cash earning activities such as NTFPs collection and processing as well as selling of fuelwood. In addition, their participation in different IGA activities supported by CFUGs helps to increase their share of cash income from CF. In Kalobhir CFUG, the very poor class are also getting profit from a paper company. As the very poor class includes old and disabled people, they cannot be involved actively in cash earning activities in CF, hence despite having the lowest economic status, they have less of a share in cash income than the poor class. [Acharya \(2005\)](#) concluded in his study that community based forest enterprises could play an important role in socio-economic empowerment of CFUG members in the mid-hills. Similarly, [Subedi \(2006\)](#) also reported in his findings that enterprise-oriented community forest management can generate positive outcomes in both conservation and local livelihood.

5.5 Contribution of CF in HH income and in inequality measures

5.5.1 Contribution of CF to total household income

The contribution of CF income to the total household income is varied for different economic classes. For total total income from CF, the poor has the highest share followed by the medium class. In many studies, it was mentioned that medium class people are getting more benefit from CF (Bhattarai and Ojha, 2000; Adhikari, 2004; Mahanty et al., 2006) whereas they are second in both CFUGs in this study. It could be because both studied CFUGs are in enterprise mode. They have forest based enterprises where poor HHs was engaged for harvesting and processing raw materials such as Lokta and Argeli. In addition, they are also involved in trading of fuelwood to both local market and enterprise. Hence, the majority of poor HHs in both CFUGs are involved in cash earning through trading of FPs and engaging in forest based enterprise (Table 12).

However, medium class HHs are getting more subsistence benefits than cash as these people are mostly depend on CF for fuelwood, fodder and leaf litter for household consumption, hence these HH have a preference too (figure 9 and 11). Furthermore, the contribution from agriculture, off farm and livestock is found to be the highest for the rich class in the case of CFUGs except from livestock for the medium class in Kalobhir. This could be because the rich have more landholding and greater opportunities for off farm activities while the poor have less land and also less access to high earning off farm activities. Most of the poor basically rely only on low earning labour work with unsecured job tenure.

The very poor HHs have the lowest share on all sources of income including CF, as these HHs require less forest products. However, CF has the highest contribution to the total HH income of the very poor and poor (figure 20). It means that the very poor and the poor have the highest dependency on the forest for their livelihoods. CF income has particular significance for the poorer households with little or no private land, as they are less likely to meet their needs from private resources (Paudyal et al., 2006; Cooke, 2000). Contribution of CF income to the total HH income of the rich class is the lowest indicating that they have less dependency on the CF. The study shows that dependency on the CF decreases as economic status improves.

5.5.2 Income distribution and inequality measures

The income distribution among the different HH is analyzed through Lorenz curves and Gini coefficients. In both CFUGs, the income inequality among the HHs increased when the total income from CF is excluded from the total HH income and vice-versa (figure 21). It implies that inclusion of CF income in the total HH income helps in reducing the income inequalities among the HHs. Similar studies carried out by [Khanal \(2001\)](#) had also shown that CF is playing an important role to decrease income inequality within CFUG. This could be due to the income contribution from CF is found the highest as economic status of users decreases (significant @ 5%). For example, CF has the highest contribution to the total HH incomes of the poor while the lowest for the rich (figure 20). Furthermore, Gini coefficients are less for Bhitteripakha than Kalobhir, indicating that there is less income inequality in Bhitteripakha than in Kalobhir. It may be because some households of Kalobhir are residences of *Jiri* who are running businesses and hence have high income whereas all the HHs of Bhitteripakha are from the village area with their major occupation being agriculture. Although, there is significant difference in CF income among classes, there is no significant difference when analysed with the grouping variable caste and household head (gender). With this, the third null hypothesis, there is no significance difference on total forest income among different socio-economic classes, is rejected for economic variable whereas it is accepted for caste and household head.

5.5.3 Per capita income of individuals

Higher per capita CF income of the poor in both CFUGs could be due to the poor are getting receiving more cash and subsistence benefit as compared to other classes. The lowest per capita income for the very poor in total CF income is because they are taking less subsistence forest product from CF. Though the medium class has the lowest per capita cash income from CF, they have high per capita in total CF income indicating that their high dependency on the forest for subsistence forest product. According to the United Nation's Millennium Development Goal (MDG) any person living on less than one US dollar (NRs 65) per day is poor. In studied CFUGs, rich and medium classes have per day per capita total income higher than one US dollar, except in Bhitteripakha for medium class which is slightly less. Per day per capita total income of both the poor and very poor is less than one US dollar. In both CFUGs, the higher contribution by CF for per day per capita of poor is helping, to some extent, to meet the first goal of MDG, which is the eradication of extreme poverty and hunger.

Chapter 6: Conclusions and Recommendations

6.1 Conclusions

This study has concluded that the preference over different forest products varied across economic classes. The preference is determined by various factors such as economy, livelihood strategy and landholding. The preference for fuelwood is determined by all three factors. The higher economic class users have access to alternative energy sources like LPG and a substantial quantity of their fuelwood requirement is fulfilled from their private land. Hence, they have less preference for it whereas for the poor and very poor fuelwood selling is one of the important livelihood strategies. Economic factors are responsible for preferences for timber and NTFPs. Timber is most preferred by the rich class as they have the capacity for constructing new houses whereas, the poor preferred NTFPs most as they have limited sources of income and hence adopt it as an alternative livelihood strategy. For rich, medium, and some poor class users, who rented land and livestock from the rich, the major livelihood strategy is husbandry; hence they have more preference for fodder and leaf litter.

Though this study do not analyze social dimensions affecting participation, with reference to other studies ([Malla et al., 2003](#) and [Chettri, 2005](#)) it can be concluded that socio-economic dimension of the society are responsible for the participation in CFUG. Although rich and medium class people have less presence in the GA and meetings, they have decisive roles in the decision-making process. They try to impose their opinion and seldom listen to poor users, which is also responsible in shaping the negative attitude of the poor towards decision making processes of CFUG. The influence of external agencies such as I/NGOs and GOs has helped to increase the participation of poor and very poor in activities like training/workshops and tour.

Concerning benefit sharing, the rich and medium class whose major livelihood strategy is husbandry and are also economically better off are taking mainly subsistence forest products. Whereas, the poor and very poor are taking more commercial forest products and are involved in forest based enterprises. Statistical analysis also shows that there is a significant difference ($p < 0.05$) in cash income from CF among different economic classes. The high benefit cost ratio of the poor indicates extracting commercial products from forest is more profitable than subsistence products.

The study shows that user's dependency on the forest increases with the decrease in economic status. Statistically, it can also be concluded that economic class is responsible for the dependency of users in CF, whereas other variables such as caste and household head (gender) are not responsible as the difference in income of those using these variables is insignificant ($p>0.05$). In both CFUGs, Gini coefficients of total HH income including cash and total CF income are lower than without CF income. With this, it can be further concluded that access of poor users in CF products helps to lower the income inequality in community.

Finally, this study cautiously concludes that community forest running in enterprise mode by commercializing its forest products as well as supporting pro-poor programme provides more benefit to poor users. However, a lot has to still be done to deliver benefit to very poor users. The very poor are still deprived of getting maximum benefit from CF and they are actual needy for that. Increased representation of women and the poor in CFUG committees would give a voice to the less powerful and facilitate in making more impartial rules. As CF income per day per capita is the highest for poor, CF is moving forward to meet the first goal of the MDG. However, the lowest value for very poor implies that CFUG is still unable to alleviate poverty of vulnerable groups so in future the programme must focus on the very poor class.

6.2 Recommendations and implications

Recommendations for the Kalobhir and Bhitripakha CFUGs

- Community forest executive members should select the lower class people for the empowerment training so that they can be mixed up with other easily after they become empower.
- As very poor are unable to extract more forest product because of their nature of job and also physical condition, CFUG should provide them more fund for IGA.
- CFUG should invest more shares in the name of very poor and poor users in community based forest enterprises.
- In Bhitripakha CFUG, allocation of CF land to sub-groups has resulted positive impact on their livelihoods through different IGA, especially for landless, hence such practice has also to be initiated by Kalobhir CFUG

Recommendations for service providers & future research

- Provide fund mobilization training for CFUGC for effective mobilization of fund
- Regarding training, mainstreaming is not much effective as lower class people can not mix well with middle/higher class to express their feelings in front of socially dominate people. So, they should be given empowerment training separately where, they can learn how to present their views without any hesitation.
- Income Generation Activities, as they provide immediate and considerable income, should be taken into account. Emphasis should be given on management of commercial product products.
- Involvement of poor forest users in IGA should be encouraged. It contributes to create employment opportunities and supports to reduce poverty. The DFO, FECOFUN, NSCFP, ANSAB should support the CFUGs in this regard.
- Further studies investigating total indirect benefits including ecosystem services and multiplier effects of CF as well as respective impacts on rural livelihoods and poverty alleviation are suggested.

6.3 Research implication

Enterprise oriented community forest has a significant contribution on household level and creates a number of employment opportunities to local level where unemployment is one major problem. It is wise to expand this type of modality through out the nation and provide an opportunity for investment to create employment for very poor users. As poor users are getting more cash income from CF than other class, commercialization of forest product is necessary in those CFUG which are using their products only for subsistence use. However, special attention of the equity concept has to be taken to channelise maximum benefit to very poor users. At last, further studies investigating total indirect benefits and multiplier effects of CF as well as respective impacts on rural livelihoods and poverty alleviation are suggested.

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Annex I: Criteria for the well-being ranking set by key informants

Well-being Ranking	Characteristics / Criteria
Rich	<p>Sufficient food for 12 months or more with surplus for sale; Large house with slates or tin roof and separate animal shed; 15 Ropani (about 0.8 hectares) and more land kharbari (thatch land); Good quality livestock At least 2 family member engaged in a permanent job, business or other secure off-farm job with a good cash income; Children attend schools and colleges in towns, Most family members are literate; Most depend on their private forest.</p>
Medium	<p>Sufficient food for 9-12 months Medium size house, with or without slates or tin roof and a separate animal shed; 15 Ropani (0.5 - 0.8 hectares) of land (sometime may have more land than that), Family labor exchange for agricultural work; Keep 3-4 livestock; At least 1 engaged in a permanent job, business or other secure off-farm job with a good cash income Depend on both private land and sometime community and government (non-FUG) forests for forest products;</p>
Poor	<p>Sufficient food for 6- 9 months; Work on daily wages for twelve months to survive Mostly household members are illiterate few children are literate; Less than 5 Ropani (0.25 hectares) of land Keep few livestock almost all belonging to rich/ medium class people raising on tenancy Most depended on community and government (non-FUG) forests for forest products.</p>
Very poor	<p>Sufficient food for 3-6 months Work on daily wages for twelve months to survive Mostly household members are illiterate few children are literate; Less than 2 Ropani of land Keep few livestock almost all belonging to rich/ medium class people raising on tenancy Number of people in the household is less and also mostly represent the old and the disable people Most depended on community and government (non-FUG) forests for forest products.</p>

Annex II: Questionnaire for Household Survey

Date of Interview:

Interview no:

Name of CFUG:

Hamlet/Ward:

1. General Information of the respondent

a. Name:

b. Age:

c. Gender Male ☐ Female ☐

d. Caste/Ethnicity:

e. Well being class: Rich ☐ Medium ☐ Poor ☐ Very Poor ☐

2. Household information on the respondent

a. No of household members Male ☐ Female ☐ Total ☐

b. Education of the respondents and his/her family members

Illiterate		Upto schooling		Higher School		Remarks
M	F	M	F	M	F	

c. Head of the households: Male ☐ Female ☐

3. Is there on farm and off farm livelihood activities exist in your localities?

Yes ☐ No ☐

4. Livelihood strategies

What are the major livelihood activities being adopted in your household?

i) Income and expenditure of Households (on farm activities)

Livelihood strategies	Involvement of Gender		Expenditure /year	Income/ year
	Male	Female		
Agriculture (Cereal Crop, High Value crop, Vegetables cultivation, Fruit production, Livestock/ livestock product)				
Forest products collection and sale including NTFPs				

ii) Income from off-farm activities

Income Sources	No of employee	Involvement of Gender		Total Income/year
		Male	Female	
Service				
Business				
Wage labor				
Opportunities (training/ WS etc..)				

5. Landholding of family

What are the types and area of land that your family holds?

Land Type	Land ownership	Total area (Ropani)
Upland (bari)	Landless	
	owned	
	Rent in	
	Rent to	

6. Input cost and Agriculture production of Households

Please mention the quantity of land owned in your household, total annual production, their value and cost of input used for production.

Agricultural crops	Cropping area (Ropani)	Cost of inputs	Qty of annual production (Pathi)	Price/ Pathi (Rs.)	Food Sufficiency (period-month) (1-3), (3-6), (6-9), (9-12)	Remarks
		(Manure, fertilizer, seed, pesticides, hired labor)				

i. What do you feel about the contribution of forest to your income from crop production?

[] high contribution to what percentage or part of total income?

[] medium contribution to what percentage or part of total income?

.....

[] Not at all

ii. Would you please mention the cause, you feel how forest contributes to your income from crop production?

- a) Green manure from leaf litter
- b) Fulfilling the needs of fuelwood
- c) Supplying agriculture implements
- d) Increase rainfall and soil moisture

7. Input and output from Livestock

Please mention the livestock number and how do you manage them?

S N	Livestock (Buffalo Goat/ sheep Pigs Chicken)	Own No.	In half share No.	Total Input cost in NRs (Grazing, Feed Agri .by Product Grass fed)	Person involved cost	Grazing in /stall feeding				Total Income
						Stall feed	C F	N F	P F	

i). How long do you have to travel to and from the community forest for animal grazing?

(1-3h), (3-6h), (6-9h), (9-12h)

ii). In your opinion how the forest can contribute, income from livestock products?

- a) Grass and bedding material
- b) Garaging place
- c) Improve good environment
- d) Improve cattle shed

Forest Contribution in livelihoods

8. What are the major Forest products in your forest and how many quantities you brought every year?

SN	Items	Units/ Quantity
1	Timber	
2	Fuelwood	
3	Fodder	
4	NTFPs	
5	Leaf litter	
6	Others	

i) Is CF able to fulfill your needs?

Yes [] No []

Cost Aspect

9. Contribution of Household in CF management and other activities/Cost involved in CF

a. Time consumption in forest product collection by households?

S.N.	Forest products	Unit	Price pay	Tim e	Responsible Person		
					Men	Women	Children
1	Major forest product (Firewood, Fodder, Timber)						
2	Minor forest products (Leaf litter, Thatching grass, Grasses)						
3	NTFPs						

b. How much time do you spend in annual basis for forest management & institutional development activities?

S. N.	FUG Activities	Time Spent (Days)	Rate/day	Total contribution in monetary term
1	CF management (watching, monitoring, Plantation, Weeding, Thinning and pruning etc.)			
2	Institutional Development (Meetings, General Assembly)			

- c. Is there any direct cash incur to your household annually for communicating, information gathering and traveling for community forestry related activities? Yes []
No []

If yes, what are the tentative direct cash earn (Rs.)

- d. What amount (User Group membership fee) you have to pay annually as a member of Forest User Group? (Rs.) Pay () Do not need to pay

- e. Do you hire any paid labour beside your family members in collecting or processing of those forest products from community forest? () Number (Rs.)

- f. What is the distance to community forest?
(0.5-1)km (1-1.5)km (1.5-3)km

- g. How long does it take to reach to the CF, collect the product and return to home with following products?

(The purpose of this question is to find out the collection and transportation cost of different forest products. The total hours spent in collection and transportation was multiplied by the wage rates to find out the actual cost of collection.)

Forest Products	Unit	<1 hour	1-3hours	3-6hours	6 –9 hours	9-12 hours
Major						
Minor						
NTFPs						

- h. How long does it take to reach to the next nearest forest, collect the product and return to home following products?

(The purpose of the question is to get the opportunity cost of collection of forest products.)

Forest Products	Unit	<1 hour	1-3 hours	3-6 hours	6 –9 hours	9-12hours
Major						
Minor						
NTFPs						

10. Do you have alternative energy source?

The purpose of this question is to get the shadow pricing of fuel wood

Yes No

If yes what is the price per unit and requirement per year?

Source of fuel	Unit	Price per unit	Requirement/day
Kerosene			
Gas			
Electricity			

11. Do you use agricultural residue for cattle feeding?

(The purpose of this question was to get the shadow pricing of grass/ fodder).

If yes, how much straw is required to substitute one *bhari* of fodder?

Do you sell or buy straw?

What is the normal local price of straw or rice?

Participation and decision making

12. Decision making process in executive committee meeting and general assemblies?

Decision making Forum	Decision making process					
	Chair-person	Elite	Committee domination	Majority domination	Unanimous	Consensus
General Assemblies						
Committee Meetings						

Do you participate in regular general assembly and meeting?

Yes [] No []

13. How do you rank your participation in the decision making process? (According to S. Arnstein)

a) Citizen control b) Tokenism c) Non participation

Do they add your voice in decision?

Yes [] No []

14. Have you or any HH member got the opportunities to participate in any training, workshop or study tour related to CF?

Yes []

No []

If yes, please specify the followings:

S. N.	Training/ workshops or tour type	No. of time (participated)
1	Training/WS less than one day within district	
2	Training/WS more than one day within district	
3	Training/WS outside district	
4	Study tour within district	
5	Study tour outside district	

If no, Please clarify why you are not involved in such activities

15. What type of benefit sharing systems is practicing in your FUG?

How is the major forest products distribution system?

Product Distribution System	Major Forest Product	Minor Forest Product	NTFPs
Equity			
Equality			

16. Are there any special provisions in fund allocation and/or benefit sharing for women, poor, dalit or natural disasters victims?

a. Yes b. No c. I do not know

If yes, please specify your answer,

S.N.	Category Provision type	Women	Dalit	Poor	Victims of natural disasters
1					
2					
3					
4					

**Free charcoal for blacksmith, free timber to the users affected by natural calamities, subsidized rate for poor, job opportunities for landless people etc.*

17. Is there any provision of IGA for the poor and DAG?

Yes [☐]

No [☐]

If yes, what are the programs?

18. Do you think there is any discrimination in benefit sharing system?

Yes [☐]

No [☐]

If yes, please explain it.....

19. Please indicate your agreement or disagreement with the following statements.

S.N.	Statement	Agreement				
		1	2	3	4	5
1	Products Sell and distribution system is good					
2	Fund collection system is satisfactory					
3	User group fund is properly utilized					
4	Expenditure of fund covers the interest of most of the users					
5	Nomination of candidate for training, WS, study tour is fair					
6	Each member has an equal chance to elected in the committee					
7	Decision of the committee are in favor of users					
8	CFUGC activities are in favor of users					

1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

Substitute Goods

20. Which are the edible products you are getting from your CF?

Products	Quantity	Remarks
1		
2		

21. Enterprise aspect

i) . Is there any community based forest enterprise in your community forest?

Yes [☐]

No [☐]

If yes, what are they? List out

ii). Is there any involvement in the enterprise from your family?

- a) As a shareholder
- b) As a member
- c) As a employee (if employee which position and how much you earn)
- d) As a owner
- e) As a Collector and Contractor

.....

iii) How much do you earn per year?

.....

iv) For what purpose, do you expend those earnings?

iii) If there is no enterprise in your CF, what are the potentialities to establish enterprise in you CF. list out

1.....2.....3.....

Ranking of Forest Products

22. Which forest product has highest value for you and what is your importance of other forest products? Give score as per the importance of the products for your consumption or other use purpose.

(The purpose of ranking of forest products among the sources of income is to provide many clues to the role of forestry in the household economy.)

High value ← *No value*
1 3

S.N.	Forest Products	Relative Importance (rating)		
		1	2	3
1	Fuelwood			
2	Tree fodder/ Grass			
3	Timber			
4	NTFPs			
5	Leaf litter			

23. Do you have any suggestions regarding the improvement of existing situation especially the benefit sharing mechanisms of community forestry? How community forestry will have more contribution to users' household income, especially to the poor?

Annex III: Checklist for Group Discussion

- Forest products collection time
- Pricing of forest products
- Income generation activities
- Employment opportunities
- Participation in meeting and assembly
- Decision-making process
- Product distribution system
- FUG fund collection and mobilization
- Access to poor, women and DAG
- Nomination in training/workshop etc
- Representation of different class and caste people's in committee
- Attitude towards EC members
- Benefit sharing mechanism: forest product distribution system
- Poor- focused programmes
- Others

Annex IV: Key Informant Survey

(FUG Chairman, Secretary, Treasurer, and also from semi-confidential records)

Date:.....

1. Name and address of the CFUG:..... List of key persons:

S.N.	Name	Position	Age	Qualification
1				

2. CFUG handover date: Area of CF:
3. Total population of users:..... Male () Female ()
4. Number of HH: (Bra/Chhe.....Ethnic.....Dalits.....)

5. Number of HH by well-being classes and main basis of well being ranking:

High Class	Medium Class	Low Class
Main basis	Main basis	Main basis

1. What is the local rate of the following products?

S.N.	Products	Unit	Rate/Unit	S.N.	Products	Unit	Rate/Unit
1	Paddy			9	Milk		
2	Maize			10	Timber		
3	Millet			11	Fuelwood		
4	Mustard			12	Tree fodder		
5	Wheat			13	Grass		
6	Goat/sheep			14	Cock/Hen		

2. What is the practiced rate of different types of labour in this CFUG?

Type of Labour	In agriculture	Unskilled labour	Skilled labour	Remarks
Men				
Women				

3. What is the status of representation of gender, caste and well being classes in executive committee?

Gender		Caste			Class		
Male	Female	Br/Chh	Ethnic	Dalit	High	Medium	Low

10. How much amount of money is in your CFUG fund (in NRs)?

Total Fund:..... Amount of loan investment:..... Amount in the Bank account:.....

11. What are the major activities where CFUG fund is utilized?

S.N.	Activities	Amount Invested (NRs.)
1	ForestProtection, development and management	
2	Community development	
3	Institutional development	
4	Infrastructure development	
5	Income generation activities	

12. What are the major plant species in your CF?

1) Tree Species 2) Shrub species 3) Herb species:

13. Forest product distribution record of the last year?

S.N.	Forest products	Quantity of forest product			Remarks
		<i>Upper class</i>	<i>Medium class</i>	<i>Lower class</i>	
1	Timber				
2	Fuelwood				
3	Small wood				
4	Fodder				
5	Grasses				
6	Leaf litter				
7	Coal				
8	NTFPs				

14. How many households have been benefitted from the different types of infrastructures which was constructed by CFUG in the past?

S.N.	Infrastructure	No. of benefitted HH			Remarks
		<i>Upper class</i>	<i>Medium class</i>	<i>Lower class</i>	
1	Road				
2	School				
3	Community building				
4	Water tap				
5	Rest place				
6	Temple				
7	Others				

15. Involvement in the training and other awareness programme based on the last year record:

S.N.	Activities	Upper class	Medium class	Lower class	Remarks
1	Seminar/WS				
2	Training				
3	Tour				
4	Representation				

16. Record of CFUG loan investment by well being classes of users

S.N.	Objective of loan	Loan amount in NRs.			Remarks
		<i>Upper class</i>	<i>Medium class</i>	<i>Lower class</i>	
1					

17. Who does the decision in benefit sharing?

S.N.	Type of benefit	Person, Committee or group	Remarks
1	Forest products distribution		
2	Fund mobilization		
3	Opportunity decisions		

18. What are the major problems faced in people participation and benefit distribution?

19. What is your contribution about users' contribution to CF and return from the CF?

Annex V: Data for benefit cost analysis

Benefit Cost Analysis Sheet of Kalobhir CFUG																												
HHS Code	Well being	Population	Timber					Fuelwood							Fodder/Grass				Leaf/litter									
			Quantity (Cube feet) (a)	cost of harvesting (NRs) (b)	Royalty (NRs) (c)	Total cost (NRs) e=(a+b+c)	Value (NRs) f=(ax200)	Quantity sold (Bhari) (g)	Quantity used for household (Bhari) (h)	Total quantity of fuel wood (Bhari) i=(f+g)	Time required to collect (hr) (j)	Cost of quantity sold (NRs) (k= gxjx6.5)	Cost of hhs use (NRs) (l= hxjx6.5)	Total cost (NRs) (m=k+l)	Value of sold quantity (NRs) (n=gx100)	Value of hhs use (NRs) (o=hx100)	Total value (NRs) (p=o+n)	Quantity (Bhari) (q)	Time required (hr) (r)	Cost (NRs) (s=qrx6.5)	Value (NRs) (t=qx25)	Quantity (Bhari) (u)	Time req to go and come to CF (hr) (v)	Time required to collect (hr) (w)	Time required to collect from next nearest forest (hr) (x)	Cost (NRs) (y=u(v+w)x6.5)	Value (opportunity cost) (NRs) (z=uxX6.5)	
63	1	9	60	6300	420	6720	12000	0	40	40	5	0	1250	1250	0	4000	4000	20	2	250	500	150	2	0.5	3	2343.75	2812.5	
128	3	4	0	0	0	0	0	0	60	60	4	0	1500	1500	0	6000	6000	42	2	525	1050	100	2	0.5	3	1562.5	1875	
113	2	4	0	0	0	0	0	0	70	70	4	0	1750	1750	0	7000	7000	50	2	625	1250	300	2	0.5	2	4687.5	3750	
57	4	6	0	0	0	0	0	30	30	60	7	1312.5	1312.5	2625	3000	3000	6000	10	4	250	250	50	2	1	2	937.5	625	
95	4	3	0	0	0	0	0	20	30	50	7	875	1312.5	2187.5	2000	3000	5000	15	5	468.75	375	50	3	1	2	1250	625	
7	4	4	0	0	0	0	0	30	40	70	5	937.5	1250	2187.5	3000	4000	7000	28	5	875	700	50	3	1	3	1250	937.5	
146	4	10	0	0	0	0	0	100	60	160	7	4375	2625	7000	10000	6000	16000	0	0	0	0	0	0	0	2	0	0	
114	2	6	0	0	0	0	0	0	100	100	3	0	1875	1875	0	10000	10000	80	2	1000	2000	300	2	1	3	5625	5625	
124	3	3	0	0	0	0	0	30	20	50	4	750	500	1250	3000	2000	5000	25	2	312.5	625	150	2	0.5	3	2343.75	2812.5	
64	3	4	0	0	0	0	0	0	60	60	5	0	1875	1875	0	6000	6000	56	2	700	1400	30	2	0.5	3	468.75	562.5	
103	3	2	0	0	0	0	0	0	40	40	5	0	1250	1250	0	4000	4000	55	7	2406.25	1375	500	4	0.5	5	14062.5	15625	
9	1	7	0	0	0	0	0	0	80	80	4	0	2000	2000	0	8000	8000	20	4	500	500	200	3	0.5	4	4375	5000	
86	3	7	0	0	0	0	0	80	60	140	5	2500	1875	4375	8000	6000	14000	42	4	1050	1050	100	3	0.5	4	2187.5	2500	
29	2	5	0	0	0	0	0	0	100	100	3	0	1875	1875	0	10000	10000	56	3	1050	1400	350	3	0.5	4	7656.25	8750	
177	3	5	0	0	0	0	0	50	60	110	4	1250	1500	2750	5000	6000	11000	55	2	687.5	1375	350	2	0.5	4	5468.75	8750	
131	3	6	50	4900	500	5400	10000	150	30	180	4	3750	750	4500	15000	3000	18000	50	2	625	1250	300	2	0.5	4	4687.5	7500	
71	2	4	0	0	0	0	0	0	80	80	4	0	2000	2000	0	8000	8000	40	2	500	1000	150	2	0.5	4	2343.75	3750	
144	2	5	0	0	0	0	0	0	100	100	4	0	2500	2500	0	10000	10000	28	2	350	700	300	2	0.5	3	4687.5	5625	
104	2	5	75	8200	750	8950	15000	0	120	120	3	0	2250	2250	0	12000	12000	0	2	0	0	0	0	0	0	0	0	
75	2	5	0	0	0	0	0	30	80	110	4	750	2000	2750	3000	8000	11000	60	3	1125	1500	200	2	0.5	3	3125	3750	
209	2	6	0	0	0	0	0	0	130	130	3	0	2437.5	2437.5	0	13000	13000	55	2	687.5	1375	350	2	0.5	4	5468.75	8750	
77	1	3	0	0	0	0	0	0	20	20	4	0	500	500	0	2000	2000	14	2	175	350	100	2	0.5	4	1562.5	2500	
187	2	6	50	4800	500	5300	10000	0	100	100	4	0	2500	2500	0	10000	10000	56	3	1050	1400	500	3	0.5	5	10937.5	15625	
140	4	2	0	0	0	0	0	80	20	100	4	2000	500	2500	8000	2000	10000	14	5	437.5	350	100	2	1	3	1875	1875	
27	1	8	0	0	0	0	0	0	130	130	4	0	3250	3250	0	13000	13000	25	7	1093.75	625	200	4	0.5	6	5625	7500	
70	3	4	0	0	0	0	0	0	40	40	4	0	1000	1000	0	4000	4000	15	4	375	375	75	3	0.5	4	1640.625	1875	
195	2	4	0	0	0	0	0	0	70	70	3	0	1312.5	1312.5	0	7000	7000	50	4	1250	1250	400	2	0.5	4	6250	10000	
72	2	6	0	0	0	0	0	0	100	100	4	0	2500	2500	0	10000	10000	40	3	750	1000	200	2	0.5	4	3125	5000	
102	2	5	0	0	0	0	0	0	80	80	3	0	1500	1500	0	8000	8000	55	4	1375	1375	250	3	0.5	4	5468.75	6250	
85	2	6	0	0	0	0	0	0	100	100	4	0	2500	2500	0	10000	10000	60	4	1500	1500	300	2	0.5	5	4687.5	9375	
176	2	3	0	0	0	0	0	0	60	60	3	0	1125	1125	0	6000	6000	40	4	1000	1000	130	3	0.5	4	2843.75	3250	
83	3	3	0	0	0	0	0	50	30	80	4	1250	750	2000	5000	3000	8000	10	4	250	250	50	3	0.5	4	1093.75	1250	
149	2	4	0	0	0	0	0	0	75	75	4	0	1875	1875	0	7500	7500	0	0	0	0	0	0	0.5	0	0	0	
89	2	1	0	0	0	0	0	0	25	25	4	0	625	625	0	2500	2500	35	2	437.5	875	300	3	0.5	4	6562.5	7500	
101	3	5	0	0	0	0	0	100	50	150	4	2500	1250	3750	10000	5000	15000	20	4	500	500	150	3	0.5	4	3281.25	3750	
83	3	5	0	0	0	0	0	0	30	30	4	0	750	750	0	3000	3000	21	4	525	525	200	3	0.5	5	4375	6250	
143	4	12	0	0	0	0	0	70	80	150	5	2187.5	2500	4687.5	7000	8000	15000	20	4	500	500	70	3	1	4	1750	1750	
8	4	4	0	0	0	0	0	70	40	110	6	2625	1500	4125	7000	4000	11000	20	4	500	500	10	3	1	4	250	250	
22	1	6	0	0	0	0	0	0	70	70	4	0	1750	1750	0	7000	7000	42	4	1050	1050	250	3	0.5	5	5468.75	7812.5	
121	3	3	0	0	0	0	0	0	60	60	4	0	1500	1500	0	6000	6000	40	4	1000	1000	100	3	0.5	4	2187.5	2500	
36	1	6	80	8300	800	9100	16000	0	60	60	4	0	1500	1500	0	6000	6000	42	4	1050	1050	270	3	0.5	5	5906.25	8437.5	
133	2	10	0	0	0	0	0	0	150	150	4	0	3750	3750	0	15000	15000	63	3	1181.25	1575	500	3	0.5	5	10937.5	15625	
94	3	7	0	0	0	0	0	60	70	130	4	1500	1750	3250	6000	7000	13000	35	4	875	875	100	3	0.5	5	2187.5	3125	
33	2	4	0	0	0	0	0	0	60	60	4	0	1500	1500	0	6000	6000	28	4	700	700	200	2	0.5	5	3125	6250	
116	3	10	0	0	0	0	0	100	100	200	4	2500	2500	5000	10000	10000	20000	60	4	1500	1500	200	3	0.5	4	4375	5000	
58	4	7	0	0	0	0	0	60	70	130	5	1875	2187.5	4062.5	6000	7000	13000	10	5	312.5	250	20	3	1	4	500	500	
160	2	5	0	0	0	0	0	0	50	50	4	0	1250	1250	0	5000	5000	35	4	875	875	250	3	0.5	4	5468.75	6250	
55	2	2	0	0	0	0	0	0	40	40	3	0	750	750	0	4000	4000	77	2	962.5	1925	275	3	0.5	4	6015.625	6875	
167	1	4	0	0	0	0	0	0	60	60	1	0	375	375	0	6000	6000	42	1	262.5								

Benefit Cost Analysis Sheet of Kalobhir CFUG (Contineud)																							
HHs Code	Welbe ing	Popula tion	Time required to collect argeli / lokta(hr) (aa)	Time required to collect other (hr) (ab)	Argeli /lokta quqntity (kg) (ac)	Other quantity (kg) (ad)	NTFPs Argeli/lokt a value (NRs) (ae)	Other value (NRs) (af)	Cost of collection and cleaning (NRs) (ag=(aa+ab)x6.5)	Value (NRs) (ah=ae+af)	Cost of forest managem ent (NRs) (ai)	Cost of instnutional developm ent (NRs) (aj)	Inocme from IGA (NRs) (ak)	Cost involved in IGA (NRs) (al)	Income from enterprise (NRs) (am)	Cost involve in income from enterprise (NRs) (an)	Total cash (NRs) (ao=n+ah+am)	Total subsistanc e income (NRs) (ap=f+o+t+z)	Total forest income (NRs) (aq=ak+a o+ap)	Total cost (NRs) (ar=e+k+l+s+y+ag+ ai+aj+al+an)	Net Benefit (value-cost) (NRs) (as=aq-ar)	Benefit cost ratio (at=aq/ar)	
63	1	9	78.125	0	31.25	0	1000	0	488	1000	250	250	0		15000	9000	16000	19312.5	35313	20552	14760	1.72	
128	3	4	0	0	0	0	0	0	0	0	200	50	0		15000	9000	15000	8925	23925	12838	11088	1.86	
113	2	4	781.25	0	312.5	0	10000		4883	10000	300	700	1500	1000	0		10000	12000	23500	13945	9555		1.69
57	4	6	78.125	100	31.25	12.5	1000	1000	1113	2000	200	100	0		0		5000	3875	8875	5226	3649		1.70
95	4	3	0	0	0	0	0	0	0	0	150	100	0		0		2000	4000	6000	4156	1844		1.44
7	4	4	0	0	0	0	0	0	0	0	150	100	750	500			3000	5637.5	9388	5063	4325		1.85
146	4	10	234.375	120	93.75	25	3000	2000	2215	5000	150	100	0				15000	6000	21000	9465	11535		2.22
114	2	6	156.25	80	62.5	0	2000	0	1477	2000	300	150	200	100	0		2000	17625	19825	10527	9298		1.88
124	3	3	117.1875	60	46.875	6.25	1500	500	1107	2000	300	150	0		0		5000	5437.5	10438	5464	4974		1.91
64	3	4	39.0625	0	15.625	0	500	0	244	500	300	150	200	150	0		500	7962.5	8663	3888	4775		2.23
103	3	2	312.5	130	125	37.5	4000	3000	2766	7000	300	150	0		0		7000	21000	28000	20934	7066		1.34
9	1	7	0	0	0	0	0	0	0	0	150	100	500	200	1000	400	1000	13500	15000	7725	7275		1.94
86	3	7	781.25	450	312.5	75	10000	6000	7695	16000	150	100	1000	500	0		24000	9550	34550	16058	18492		2.15
29	2	5	156.25	450	62.5	75	2000	6000	3789	2600	150	100	0		0		2600	20150	22750	14620	8130		1.56
177	3	5	0	0	0	0	0	0	0	0	150	100	0		0		5000	16125	21125	9156	11969		2.31
131	3	6	78.125	0	31.25	0	1000	0	488	1000	250	100	0		11000	800	27000	21750	48750	16851	31899		2.89
71	2	4	0	0	0	0	0	0	0	0	250	100	0		0		0	12750	12750	5194	7556		2.45
144	2	5	0	0	0	0	0	0	0	0	250	100	0		0		0	16325	16325	7888	8438		2.07
104	2	5	273.4375	60	109.375	12.5	3500	1000	2084	4500	250	100	0		0		4500	27000	31500	13634	17866		2.31
75	2	5	0	0	0	0	0	0	0	0	300	100	0		0		3000	13250	16250	7400	8850		2.20
209	2	6	0	0	0	0	0	0	0	0	300	200	0		0		0	23125	23125	9094	14031		2.54
77	1	3	78.125	0	31.25	0	1000	0	488	1000	150	100	0		60000	25000	61000	4850	65850	27976	37874		2.35
187	2	6	1171.875	200	468.75	37.5	15000	3000	8574	18000	150	100	500	300	5000	1500	23000	37025	60525	30412	30113		1.99
140	4	2	0	0	0	0	0	0	0	0	300	200	200	100			8000	4225	12425	5413	7013		2.30
27	1	8	0	0	0	0	0	0	0	0	350	100	0		0		0	21125	21125	10419	10706		2.03
70	3	4	0	0	0	0	0	0	0	0	100	50	0		0		0	6250	6250	3166	3084		1.97
195	2	4	250	0	100	0	3200	0	1563	3200	100	50	0		0		3200	18250	21450	10525	10925		2.04
72	2	6	0	0	0	0	0	0	0	0	150	100	0		0		0	16000	16000	6625	9375		2.42
102	2	5	0	0	0	0	0	0	0	0	300	100	0		23000	5000	23000	15625	38625	13744	24881		2.81
85	2	6	0	0	0	0	0	0	0	0	150	50	0		0		0	20875	20875	8888	11988		2.35
176	2	3	0	0	0	0	0	0	0	0	100	50	0		0		0	10250	10250	5119	5131		2.00
83	3	3	78.125	60	31.25	6.25	1000	500	863	1500	450	50	1500	1000			6500	4500	12500	5707	6793		2.19
149	2	4	0	0	0	0	0	0	0	0	250	50	0		1500	1000	1500	7500	9000	3175	5825		2.83
89	2	1	0	0	0	0	0	0	0	0	100	100	0		0		0	10875	10875	7825	3050		1.39
101	3	5	0	0	0	0	0	0	0	0	100	100	0		0		10000	9250	19250	7731	11519		2.49
83	3	5	234.375	100	93.75	25	3000	2000	2090	5000	150	100	0		5000	3000	10000	9775	19775	10990	8785		1.80
143	4	12	187.5	130	62.5	25	2000	2000	1984	4000	250	100	0		0		11000	10250	21250	9272	11978		2.29
8	4	4	125	60	31.25	6.25	1000	500	1156	1500	400	50	200				8500	4750	13450	6481	6969		2.08
22	1	6	39.0625	0	15.625	0	500	0	244	500	50	50	0		0		500	15862.5	16363	8613	7750		1.90
121	3	3	156.25	70	62.5	6.25	2000	500	1414	2500	200	50	0		0		2500	9500	12000	6352	5648		1.89
36	1	6	0	0	0	0	0	0	0	0	250	100	0		0		0	31487.5	31488	17906	13581		1.76
133	2	10	0	0	0	0	0	0	0	0	250	0	0		0		0	32200	32200	16119	16081		2.00
94	3	7	156.25	0	62.5	0	2000	0	977	2000	200	100	0		30000	2000	38000	11000	49000	9589	39411		5.11
33	2	4	0	0	0	0	0	0	0	0	200	100	0		0		0	12950	12950	5625	7325		2.30
116	3	10	156.25	100	62.5	12.5	2000	1000	1602	3000	150	100	0		0		13000	16500	29500	12727	16773		2.32
58	4	7	187.5	90	62.5	8.75	2000	700	1734	2700	150	150	0		0		8700	7750	16450	6909	9541		2.38
160	2	5	0	0	0	0	0	0	0	0	100	100	0		0		0	12125	12125	7794	4331		1.56
55	2	2	0	0	0	0	0	0	0	0	150	100	0		0		0	12800	12800	7978	4822		1.60
167	1	4	0	0	0	0	0	0	0	0	100	100	0		2000	1000	2000	13300	15300	3713	11588		4.12
157	1	6	0	0	0	0	0	0	0	0	150	300	0		0		0	7437.5	7438	2294	5144		3.24
81	1	5	0	0	0	0	0	0	0	0	150	600	0		0		0	5000	5000	1375	3625		3.64
156	1	7	0	0	0	0	0	0	0	0	150	600	0		0		0	8225	8225	3913	4313		2.10
189	1	3	0	0	0	0	0	0	0	0	150	600	0		0		0	5050	5050	3269	1781		1.54
117	2	5	0	0	0	0	0	0	0	0	150	600	0		0		0	5000	5000	1375	3625		3.64
90	1	6	0	0	0	0	0	0	0	0	100	300	0		0		0	18350	18350	9494	8856		1.93

Benefit Cost Analysis Sheet of Bhitteripakha CFUG																													
HHs Code	Well eing	Popula tion	Timber					Fuelwood					Fodder/Grass					Leaf litter											
			Quantity (Cub feet) (a)	cost of harvesting (NRs) (b)	Royalty (NRs) (c)	Total cost (NRs) e=(a+b+c)	Value (NRs) f=(ax20 0)	Quantity sold (Bhari) (g)	Quantity used for household (Bhari) (h)	Total quantity of fuel wood (Bhari) i=(f+g)	Time required to collect (hr) (j)	Cost of quantity sold (NRs) (k= gxjx6.5)	Cost of hhs use (NRs) (l= hxjx6.5)	Total cost (NRs) (m=k+l)	Value of sold quantity (NRs) (n=gx100)	Value of hhs use (NRs) (o=hx100)	Total value (NRs) (p=o+n)	Quantity (Bhari) (q)	Time required (hr) (r)	Cost (NRs) (s=qrx 6.5)	Value (NRs) (t=qx25)	Quantity (Bhari) (u)	Time req to go and come to CF (hr) (v)	Time required to collect (hr) (w)	Time required to collect from next nearest forest (hr) (x)	Cost (NRs) (y=u+(v+w) x6.5)	Value (opportunity cost) (NRs) (z=uxX6.5)		
210	2	6	70	7200	490	7690	14000	0	80	80	7	0	3500	3500	0	8000	8000	50	4	1250	1250	365	3	0.5	4	7984.375	9125		
60	2	8	0	0	0	0	0	0	120	120	4.5	0	3375	3375	0	12000	12000	49	4	1225	1225	250	2	0.5	3	3906.25	4687.5		
186	3	5	0	0	0	0	0	0	50	50	4	0	1250	1250	0	5000	5000	20	4	500	500	140	3	0.5	4	3062.5	3500		
183	3	6	0	0	0	0	0	0	40	50	90	2	500	625	1125	4000	5000	9000	35	2	437.5	875	150	2	0.5	5	2343.75	4687.5	
7	4	5	0	0	0	0	0	0	20	28	48	5	625	875	1500	2000	2800	4800	10	4	250	250	50	4	0.5	5	1406.25	1562.5	
113	2	5	0	0	0	0	0	0	0	80	80	3	0	1500	1500	0	8000	8000	50	2	625	1250	250	2	0.5	3	3906.25	4687.5	
165	4	2	0	0	0	0	0	0	10	14	24	4	250	350	600	1000	1400	2400	10	4	250	250	40	3	0.5	4	875	1000	
123	2	8	0	0	0	0	0	0	20	120	140	2	250	1500	1750	2000	12000	14000	40	2	500	1000	300	2	0.5	5	4687.5	9375	
111	3	5	0	0	0	0	0	0	0	35	35	4	0	875	875	0	3500	3500	25	4	625	625	100	3	0.5	5	2187.5	3125	
234	4	6	0	0	0	0	0	0	0	42	42	3	0	787.5	787.5	0	4200	4200	10	3	187.5	250	50	3	0.5	4	1093.75	1250	
218	2	4	0	0	0	0	0	0	30	50	80	3	562.5	937.5	1500	3000	5000	8000	20	2	250	500	275	2	0.5	5	4296.875	8593.75	
75	3	7	0	0	0	0	0	0	0	63	63	3	0	1181.25	1181.25	0	6300	6300	45	1	281.25	1125	0	0	0.5	0	0	0	
110	3	4	0	0	0	0	0	0	0	35	35	2	0	437.5	437.5	0	3500	3500	0	2	0	0	0	2	0.5	4	0	0	
66	3	7	50	4800	500	5300	10000	0	49	49	3	0	918.75	918.75	0	4900	4900	35	2	437.5	875	250	2	0.5	3	3906.25	4687.5		
232	3	8	0	0	0	0	0	0	0	35	35	2	0	437.5	437.5	0	3500	3500	25	2	312.5	625	150	2	0.5	4	2343.75	3750	
204	3	4	0	0	0	0	0	0	0	28	28	4	0	700	700	0	2800	2800	20	4	500	500	125	3	0.5	4	2734.375	3125	
48	2	9	0	0	0	0	0	0	0	60	60	3	0	1125	1125	0	6000	6000	45	2	562.5	1125	250	2	0.5	5	3906.25	7812.5	
108	3	5	0	0	0	0	0	0	0	30	30	4	0	750	750	0	3000	3000	20	4	500	500	250	3	0.5	5	5468.75	7812.5	
126	4	7	0	0	0	0	0	0	0	42	42	3	0	787.5	787.5	0	4200	4200	0	2	0	0	0	3	0.5	4	0	0	
80	3	6	0	0	0	0	0	0	40	42	82	2	500	525	1025	4000	4200	8200	30	2	375	750	100	2	0.5	5	1562.5	3125	
203	3	5	0	0	0	0	0	0	0	35	35	4	0	875	875	0	3500	3500	25	4	625	625	200	3	0.5	4	4375	5000	
207	2	9	0	0	0	0	0	0	0	80	80	4	0	2000	2000	0	8000	8000	70	4	1750	1750	250	3	0.5	5	5468.75	7812.5	
63	3	7	0	0	0	0	0	0	30	63	93	4	750	1575	2325	3000	6300	9300	45	4	1125	1125	125	3	0.5	4	2734.375	3125	
208	3	7	0	0	0	0	0	0	0	49	49	4	0	1225	1225	0	4900	4900	35	4	875	875	200	3	0.5	4	4375	5000	
158	2	6	0	0	0	0	0	0	0	60	60	2	0	750	750	0	6000	6000	60	2	750	1500	275	2	0.5	5	4296.875	8593.75	
72	2	8	60	6500	600	7100	12000	0	90	90	3	0	1687.5	1687.5	0	9000	9000	50	2	625	1250	350	2	0.5	4	5468.75	8750		
95	4	4	0	0	0	0	0	0	30	49	79	4	750	1225	1975	3000	4900	7900	20	3	375	500	150	3	1	4	3750	3750	
61	4	4	0	0	0	0	0	0	0	28	28	3	0	525	525	0	2800	2800	20	2	250	500	150	3	1	4	3750	3750	
128	2	3	0	0	0	0	0	0	0	35	35	2	0	437.5	437.5	0	3500	3500	25	2	312.5	625	150	2	0.5	4	2343.75	3750	
103	2	7	0	0	0	0	0	0	0	70	70	4	0	1750	1750	0	7000	7000	60	4	1500	1500	150	3	0.5	5	3281.25	4687.5	
106	3	5	0	0	0	0	0	0	0	28	28	4	0	700	700	0	2800	2800	20	4	500	500	100	3	0.5	6	2187.5	3750	
104	1	8	0	0	0	0	0	0	0	35	35	2.5	0	546.875	546.875	0	3500	3500	25	2	312.5	625	100	2	0.5	5	1562.5	3125	
47	3	5	0	0	0	0	0	0	40	35	75	4	1000	875	1875	4000	3500	7500	25	4	625	625	175	3	0.5	4	3828.125	4375	
216	4	6	0	0	0	0	0	0	30	42	72	4	750	1050	1800	3000	4200	7200	10	4	250	250	50	3	0.5	4	1093.75	1250	
196	1	6	50	5500	500	6000	10000	0	40	40	4	0	1000	1000	0	4000	4000	40	4	1000	1000	50	3	0.5	6	1093.75	1875		
33	1	4	0	0	0	0	0	0	0	28	28	4	0	700	700	0	2800	2800	20	4	500	500	0	0	0.5	0	0	0	
217	1	7	60	5900	600	6500	12000	0	56	56	4	0	1400	1400	0	5600	5600	40	4	1000	1000	0	0	0.5	0	0	0	0	
25	1	4	0	0	0	0	0	0	0	28	28	4	0	700	700	0	2800	2800	20	4	500	500	0	0	0.5	0	0	0	0
143	3	5	0	0	0	0	0	0	0	42	42	4	0	1050	1050	0	4200	4200	30	4	750	750	300	3	0.5	4	6562.5	7500	
119	4	7	0	0	0	0	0	0	10	42	52	4	250	1050	1300	1000	4200	5200	30	4	750	750	200	3	0.5	4	4375	5000	
88	1	7	0	0	0	0	0	0	0	49	49	4	0	1225	1225	0	4900	4900	35	4	875	875	250	3	0.5	4	5468.75	6250	
20	2	6	0	0	0	0	0	0	0	60	60	4	0	1500	1500	0	6000	6000	50	4	1250	1250	250	3	0.5	5	5468.75	7812.5	
125	2	6	0	0	0	0	0	0	50	55	105	4	1250	1375	2625	5000	5500	10500	30	4	750	750	275	3	0.5	5	6015.625	8593.75	
46	3	5	0	0	0	0	0	0	0	45	45	4	0	1125	1125	0	4500	4500	15	4	375	375	300	3	0.5	4	6562.5	7500	
16	3	5	0	0	0	0	0	0	0	42	42	4	0	1050	1050	0	4200	4200	30	4	750	750	0	0	0.5	0	0	0	
180	2	6	0	0	0	0	0	0	0	60	60	4	0	1500	1500	0	6000	6000	45	4	1125	1125	275	3	0.5	5	6015.625	8593.75	
233	3	6	50	5400	500	5900	10000	20</																					

Benefit Cost Analysis Sheet of Bhitripakha CFUG (Continued)																								
HHs Code	Wellbeing	Population	NTFPs										Cost of forest management (NRs) (ai)	Cost of institutional development (NRs) (aj)	Income from IGA (NRs) (ak)	Cost involved in IGA (NRs) (al)	Income from enterprise (NRs) (am)	Cost involve in income from enterprise (NRs) (an)	Total cash (NRs) (ao=n+ah+am)	Total subsistence income (NRs) (ap=f+o+t+z)	Total forest income (NRs) (aq=ak+a+o+ap)	Total cost (NRs) (ar=e+k+l+s+y+ag+ai+aj+al+an)	Net Benefit (value-cost) (NRs) (as=aq-ar)	Benefit cost ratio (at=aq/ar)
			Time required to collect argeli / lokta(hr) (aa)	Time required to collect other (hr) (ab)	Argeli /lokta qunty (kg) (ac)	Other quantity (kg) (ad)	Argeli/lokta value (NRs) (ae)	Other value (NRs) (af)	Cost of collection and cleaning (NRs) (ag=(aa+ab)x6.5)	Value (NRs) (ah=ae+af)														
210	2	6	0	0	0	0	0	0	0	0	300	50	0		0		0	0	32375	32375	20774	11601	1.56	
60	2	8	0	0	0	0	0	0	0	0	150	100	0		0		0	0	17912.5	17913	8756	9156	2.05	
186	3	5	0	0	0	0	0	0	0	0	150	650	0		0		0	0	9000	9000	5613	3388	1.60	
183	3	6	1687.5	70	562.5	25	18000	2000	10984	20000	750	650	0	0	0	24000	10562.5	34563	16291	18272	2.12			
7	4	5	250	80	62.5	40	2000	500	2063	2500	50	650	0	0	0	4500	4612.5	9113	5919	3194	1.54			
113	2	5	0	0	0	0	0	0	0	0	100	650	0	0	0	0	13937.5	13938	6781	7156	2.06			
165	4	2	187.5	20	62.5	5	2000	400	1297	2400	100	650	0	0	0	3400	2650	6050	3772	2278	1.60			
123	2	8	0	0	0	0	0	0	0	0	100	650	0	0	0	2000	22375	24375	7688	16688	3.17			
111	3	5	0	0	0	0	0	0	0	0	100	650	0	0	0	0	7250	7250	4438	2813	1.63			
234	4	6	375	70	125	75	4000	2000	2781	6000	200	650	0	0	0	6000	5700	11700	5700	6000	2.05			
218	2	4	0	0	0	0	0	0	0	0	100	650	0	0	0	3000	14093.75	17094	6797	10297	2.51			
75	3	7	0	0	0	0	0	0	0	0	3000	650	0	0	0	0	7425	7425	5113	2313	1.45			
110	3	4	0	0	0	0	0	0	0	0	100	650	0	0	10000	10000	3500	13500	1188	12313	11.37			
66	3	7	0	0	0	0	0	0	0	0	400	650	0	0	6000	6000	20462.5	26463	11613	14850	2.28			
232	3	8	0	0	0	0	0	0	0	0	400	600	0	0	3000	3000	7875	10875	4094	6781	2.66			
204	3	4	0	0	0	0	0	0	0	0	150	600	0	0	0	0	6425	6425	4684	1741	1.37			
48	2	9	375	0	125	0	4000	0	2344	4000	1200	500	0	0	0	4000	14937.5	18938	9638	9300	1.96			
108	3	5	0	0	0	0	0	0	0	0	50	50	0	0	0	0	11312.5	11313	6819	4494	1.66			
126	4	7	187.5	0	62.5	0	2000	0	1172	2000	200	650	0	0	0	2000	4200	6200	2809	3391	2.21			
80	3	6	93.75	200	31.25	100	1000	3000	1836	4000	100	650	0	0	0	8000	8075	16075	5548	10527	2.90			
203	3	5	0	0	0	0	0	0	0	0	100	650	0	0	0	0	9125	9125	6625	2500	1.38			
207	2	9	0	0	0	0	0	0	0	0	400	600	0	0	0	0	17562.5	17563	10219	7344	1.72			
63	3	7	0	0	0	0	0	0	0	0	400	350	0	0	0	3000	10550	13550	6934	6616	1.95			
208	3	7	150	0	50	0	1600	0	938	1600	150	650	0	20000	20000	21600	10775	32375	8213	24163	3.94			
158	2	6	0	0	0	0	0	0	0	0	700	250	0	0	0	0	16093.75	16094	6747	9347	2.39			
72	2	8	0	0	0	0	0	0	0	0	600	100	0	0	0	0	31000	31000	15581	15419	1.99			
95	4	4	0	0	0	0	0	0	0	0	200	650	0	0	0	3000	9150	12150	6950	5200	1.75			
61	4	4	0	0	0	0	0	0	0	0	150	600	0	0	0	0	7050	7050	5275	1775	1.34			
128	2	3	0	0	0	0	0	0	0	0	800	1200	0	0	0	0	7875	7875	5094	2781	1.55			
103	2	7	0	0	0	0	0	0	0	0	200	1200	0	0	0	0	13187.5	13188	7931	5256	1.66			
106	3	5	375	500	125	250	4000	3000	5469	7000	150	650	0	0	0	7000	7050	14050	9656	4394	1.46			
104	1	8	0	0	0	0	0	0	0	0	100	100	0	0	0	0	7250	7250	2622	4628	2.77			
47	3	5	0	0	0	0	0	0	0	0	150	100	0	0	0	4000	8500	12500	6578	5922	1.90			
216	4	6	500	100	125	120	4000	2000	3750	6000	100	100	450	0	0	9000	5700	15150	7094	8056	2.14			
196	1	6	0	0	0	0	0	0	0	0	600	650	650	0	0	0	16875	17525	10344	7181	1.69			
33	1	4	0	0	0	0	0	0	0	0	150	650	0	10000	10000	10000	3300	13300	2000	11300	6.65			
217	1	7	0	0	0	0	0	0	0	0	150	650	0	0	0	0	18600	18600	9700	8900	1.92			
25	1	4	562.5	0	187.5	0	6000	0	3516	6000	100	600	0	0	0	6000	3300	9300	5416	3884	1.72			
143	3	5	0	0	0	0	0	0	0	0	500	300	0	0	0	0	12450	12450	9163	3288	1.36			
119	4	7	0	0	0	0	0	0	0	0	100	300	0	0	0	1000	9950	10950	6825	4125	1.60			
88	1	7	0	0	0	0	0	0	0	0	100	100	0	0	0	0	12025	12025	7769	4256	1.55			
20	2	6	0	0	0	0	0	0	0	0	250	650	0	48000	48000	48000	15062.5	63063	9119	53944	6.92			
125	2	6	0	0	0	0	0	0	0	0	100	50	0	0	0	5000	14843.75	19844	9541	10303	2.08			
46	3	5	0	0	0	0	0	0	0	0	300	450	0	0	0	0	12375	12375	8813	3563	1.40			
16	3	5	459.375	280	153.125	140	4900	2000	4621	6900	150	650	0	0	0	6900	4950	11850	7221	4629	1.64			
180	2	6	0	0	0	0	0	0	0	0	300	100	0	0	0	0	15718.75	15719	9041	6678	1.74			
233	3	6	0	0	0	0	0	0	0	0	900	3700	6900	0	0	2000	19637.5	28538	12869	15669	2.22			
56	3	5	0	0	0	0	0	0	0	0	100	1300	0	4000	4000	4000	14275	18275	8828	9447	2.07			
57	2	7	0	0	0	0	0	0	0	0	800	650	3800	4000	4000	4000	21062.5	28863	12481	16381	2.31			
219	3	7	0	0	0	0	0	0	0	0	100	650	900	400	400	400	10775	12075	5231	6844	2.31			
198	3	6	0	0	0	0	0	0	0	0	150	600	0	36000	36000	36000	7475	43475	6025	37450	7.22			
179	3	4	93.75	0	31.25	0	1000	0	586	1000	150	550	0	0	0	8000	9750	17750	7817	9933	2.27			
107	1	6	0	0	0	0	0	0	0	0	150	600	0	2000	2000	2000	19500	21500	10719	10781	2.01			
77	1	4	0	0	0	0	0	0	0	0	100	450	0	0	0	0	7025	7025	3744	3281	1.88			
169	1	4	0	0	0	0	0	0	0	0	100	400	0	0	0	0	4000	4000	1625	2375	2.46			
115	1	4	0	0	0	0	0	0	0	0	200	2000	0	500	500	500	9750	10250	7638	2613	1.34			
230	2	5	0	0	0	0	0	0	0	0	100	400	0	0	0	0	15812.5	15813	8719	7094	1.81			
211	2	7	0	0	0	0	0	0	0	0	100	450	0	0	0	0	15312.5	15313	6956	8356	2.20			
112	2	4	0	0	0	0	0	0	0	0	100	600	0	0	0	0	13250	13250	5856	7394	2.26			
45	3	6	65.625	0	21.875	0	700	0	410	700	100	500	0	0	0	700	13187.5	13888	8104	5784	1.71			

Annex VI: Photographs



Kalobhir CF



Fuelwood depo



Household survey



Group discussion



Handmade paper making in enterprise



Meeting with committee members



Interview with enterprise employer



Information collection from service provider



Bhitteripakha CF



Timber depo



Household survey



Well-being ranking from key informant



Furniture enterprise



Fodder collection



Group discussion



Meeting with committee members