CHAPTER I

1. INTRODUCTION

1.1 Introduction

Nepal is a small hilly country with a landmass of about 14,7181k.m. and a population of 23.4 million people. Agriculture is the foundation of the economy, providing a livelihood for 67 percent of the population (CBS, 2001). Rural people are living there mainly practicing subsistence agriculture and natural resource management. The contribution of agricultural sector to the GDP is accounting for about 38 percent. There is slow growth in agriculture sector as an annual average of 2.5 percent as compared to the annual population growth of 2.3 percent (Economic Survey, 2004). Beside subsistence agriculture and natural resource management in rural areas, there are small industrial activities processing of agricultural products including jute, sugarcane, tobacco, and grain in so called modern sector of urban areas. The export of textiles and carpets was the main source of foreign exchange earnings, which had contributed about 80 percent of foreign exchange earnings in the past years. Now, the business of textiles and carpets appears fragile due to mainly exogenous factors- racket of illegal child labour involvement in and declining demand from aboard of these products. Nepal's economic growth rate, despite economic reforms such as reducing business licenses and registration requirements in order to simplify investment procedures, cutting expenditures by reducing subsidies, privatizing state industries, and lying off civil servants initiated by the government since 1991, is moving around between–0.46 to 1.5 percent now (Economic Survey, 2004).

Not only one or two factors are the causes for such type of sluggish growth. All the fingers of hands and legs might be less to count for this adverse situation. However, one obvious composite index might be political instability since fifteen different governments over the past fifteen years have hindered Nepal’s ability to reach in its genuine consensus to address and implement the key economic reforms. Despite of this situation, remittance from aboard of the Nepalese poor is supporting the sick economy. At the beginning of millennium, it is estimated that around 200,000 Nepali workers are employed mainly in the Gulf, 50,000 in Malaysia and probably between 1 million and 2 million in India. A recent press communiqué by the Nepal Rastra Bank has indicated that the total foreign exchange reserve in mid- February 2003 amounted to Rs111.2 billion as result of an increased inflow of worker’s remittance from third countries (Seddon,2003). Foreign funding amounting to more than 60 percent of Nepal's development budget and

more than 28 percent of total budgetary expenditures (as a major ingredient of growth) reflects that Nepal possessed two types of principal resources- labour and natural resources endowments- for accelerating economic growth and only one option by exploiting the potential of these owned resources by attracting foreign investment. Prospects for foreign trade or investment in other sectors are limited due to small size of the economy, technological backwardness, remoteness, landlocked geographic location and vulnerability to natural disaster.

Nearly 85 percent of the total population has been residing in rural areas since Mid 90s. Nepal remained one of the least developed and poorest countries in the world with nearly half of its population living below the poverty line. However, Nepal has already completed nine periodic plans and the Tenth Plan is in its final stage. The government has taken several steps to improve the conditions of poor people. But no remarkable progress has been made in this field rather the condition of poor people is deteriorating and overall poverty is increasing day by day. Since the beginning of 90s, the Eighth Plan of Nepal (1992-1997) followed by the Ninth Plan (1997-2002 and the Tenth Plan (2002-2007) have poverty reduction as their main objectives. The Ninth Plan set out to reduce the incidence of poverty in Nepal from 42 to 32 percent by the end of 2002. Similarly, the current Tenth Plan also set out to reduce the incidence of poverty in Nepal from 38 to 30 percent by the end of 2007. According to the Nepal Living Standard Survey (NLSS) 1995/96, poverty was much more severe in rural areas (44 percent households) compared to the urban areas (23 percent household) (NPC, PRSP: 2001). The intensity and severity of poverty in the rural areas were almost twice as high as those in urban area. Using the Nepal living standard survey data and poverty line[1] the National Planning Commission (NPC) of Nepal estimated the incidence of poverty in Nepal to be about 42 percent (World Bank, 1999). The summary results of poverty analysis by the Central Bureau of Statistics (CBS) of Nepal, using Nepal Living Standard Survey data and poverty line[2] 2003/04, shows that rural poverty has been decreased by 8 percentage point (from 43 percent to 35 percent) and the urban poverty has declined by 12 percentage point (from 22 percent to 10 percent) during the eight years of interval (1995/96-2003/04). Overall incidence of poverty in Nepal is to be about 31.0 percent. It has indicated the existence of the acute poverty in rural areas compared to the national average and urban areas of

[1] The poverty line was estimated to be NRS 4,404 per person per year on the basis of daily per capita calorie requirement of 2,124, average price level prevailing in 1995/96 for this food basket, and a factor to account for non-food expenditures.

[2] The poverty line was estimated to be NRS 10,318 per person per year on the basis of per person per year consumption expenditure for daily per capita calorie requirement of 2,144 deflating at the constant average price level prevailing in 1995-96 for the food basket of 2003-04 and a factor to account for non-food expenditures.

Nepal. So far human poverty is concerned, value of human development has been increased by 0. 471 in 2004 (HDR, 2004) since it was 0.378 in 1998 (HDR, 1998) and 0.466 in 2001 (HDR, 2001). This means that the performance of human poverty seems to move towards the positive trend. However, Gini Coefficient for inequality increased from 0.34 to 0.41 during the period 1996/96-2003/04 (CBS, 2005).

Forest resources are considered the most important natural resources for people's livelihood and for the maintenance of ecological balance. Therefore, loss of equity of forest resources to rural communities should viewed in relation to the irreversible loss of forest resources in the environment. Both of them have serious threat to lives and livelihoods of millions of poor families. The negative consequences of these may lead to soil and slope erosion, desertification, global climate change, flooding, water pollution, biodiversity loss, rural out migration, and destitution of indigenous disadvantaged groups and marginalized section of rural peoples. Some of these adverse processes may be irreversible.

Forest resources are the second largest resource after water resources in Nepal. About 50 percent of the total area is under some sort of natural vegetation cover such as trees, shrubs or grasses. However, forest areas are under great pressure for to meet firewood, fodder, timber, medicines and infrastructure development. Loss of forest area started along with malaria eradication and resettlement programmes in the 1950s in the Terai. The problem was further compounded due to the change of forests from private to public ownership as per the Private Forests Nationalization Act, 1957. Nepal comprised of 6.4 million hectares of forests (out of total land area of 14.72 million hectares) in 1964, which reduced to 5.8 million hectares including shrub land by the mid-1990s (DFRS, 1999a). During these three decades 0.6 million hectares of forestland has been destroyed. However, until now total area of the country's forests has remained only 4.27 million hectares (29 per cent) including 1.56 million (10.6 percent) of shrub land. In the terai plains, forest area decreased at an annual rate of 1.3 percent during the period 1978/79-1990/91. In the hills, it is decreased at an annual rate of 2.3 percent from 1978/79 to 1994 with average national forest depletion rate of 1.7 percent during the same period. The total stem volume of the accessible forest of Nepal is 387.5 million m3 with the area about 2,179.3 thousand ha and mean stem volume of 178 m3/ha. The total biomass is about 428.5 million ton (DFRS, 1999b). Forest resources have two major biodiversity values i.e. eco-system and species. Forest resource is considered as second large wealth of nation after water resource, however, it is not estimated economically for commercial purpose. In this regard, Madan K. Dahal writes "Unfortunately, the value of forest resources has not yet been estimated and commercial viability is never seriously

considered by the government while formulating the annual budget and periodic plans" (Dahal, 2004, p. 14).

However, out of total forest and shrub land (6.83 million ha) or 39.6 percent of total country's land area about 61 percent is categorized as potential community forest to be handed over to the local communities for management (DFRS, 1999b). It is estimated that there is a potential of 1,876,300 hectares forested and 1,585,800 hectares not forested land which can be developed as the community forests. Similarly, 2,313,100 hectares of Nepal's current national forests can also be considered potential community forest (MOPE, 2000). Currently, some 14, 258 Community Forest User Groups (CFUGs) with 1,640,239 household have been engaged in the management of approximately 1,187,022 hectares of forest areas (DOF, 2006).

Natural resource management at local level by the communities has become an integral part of sustainable development policy in the last few years. There is now considerable evidence that centralized management is unable to provide the right incentives for sustainable resource use. Thus, it is increasingly argued that organized civil society can play the important role in overcoming many economic problems related to internalization of externalities, provision of local public goods and access to credit by the poor-problems that neither the market nor the state can reliably solve (Molians, 1998). Recognizing the importance of organized civil society, the governments of many developing countries have begun to support community–based resource management. In Nepal and other developing countries, such attempt has focused on poverty reduction, local level socio-economic development and forest conservation and management.

Participatory resource management is viewed as a solution to a number of problems linked to state management of natural resources such as information asymmetries, incentive incompatibility, lack of effective monitoring and maintenance etc. However, results emerging from experiments in community management suggest that there may be a number of distributional problems associated with structured attempts to manage common pool/property resources (CPRs) (Kumar, 2002). Mixed results have been observed on the potential of CPR systems to have a positive impact on the livelihood of the very poor and marginalized sections of communities (Campbell et al. 2001; Beck & Nesmith, 2001). Thus, the success of CPR management appears to be dependent on the existence of a well-specified rights structure and the congruence of this regime with its ecological and social context (Hanna & Munasinghe, 1995). The CPR literature argues that the poor people extract more resources from the commons due to greater reliance on natural resources and due to their high individual rate of time preference. If poverty increases the marginal rate of time preference to a very high level, then future

environmental effects of current resource use are optimally ignored. High rates of time preference and shorter time horizons may also prevent poor people from investing in environmental conservation. Consequently, the poor disregard the need for conservation of resources and adopt strategies that yield more immediate results (Holden et al., 1998). Some scholars posit that compared to the non-poor, the poor may depend more on the commons in relative terms but in absolute terms their dependency is lower (Dasgupta, 1993). While the poor may attempt to minimize risk by using forest resources to mitigate shortfalls in consumption levels, the rich or the less poor may be interested in enhancing their earnings by selling these resources, particularly, when there are good market opportunities.

However, there have been a number of theoretical and empirical studies on the successes or failures of collective action, relatively few of them have paid attention to equity and distributional implications of common property institutions. Existing empirical studies have focused mainly on communities as opposed to households in describing the success of CPR management. It is assumed that communities will collectively manage local resources because of the substantive benefits to be derived from these resources. Moreover, when the responsibility of allocating natural resources is delegated to local organizations, communities are expected to distribute these resources more or less equitably among the members. However, there is some evidence that formalized system of community property rights may lead to a gradual but systematic exclusion of poorer households from CPRs (Beck & Nesmith, 2001).

Two decades and half have been passed of the formal introduction of community forest management for the conservation and management of forests distributed in different eco zones of Nepal, especially in the hill area with a distinctive models of community based participatory natural resource management approaches. These models had focused directly or indirectly about the forest conservation and local development together including the other community development programmes.

In the initial stages, the focus was on participatory environmental conservation through the planting of trees. Later, the emphasis turned to the institutional development of CFUGs so that they could undertake forest management activities themselves and have better control of local resources. The government's forest service would provide a facilitating regime within which these CFUGs could function well. The objective of this move towards decentralized local governance in the forest management was originally to produce forest products sufficient for the needs of CFUG members. Later, the objective expanded to include the mobilization and empowerment of these CFUGs in the broader development of their local communities (Chapagain, Kanel, & Regmi, 1999).

Although, environmental value by vegetation cover (bio-physical condition) of forest resources are found remarkably enhanced since the forest resource management regime shifted from state to local community management, which deserves little concern in such a society where poverty is pervasive and it warrants immediate goods to fulfill daily needs. However, Nepal's community forestry program is considered a leading example of community forest management in South Asia. Thus, the potential of community forestry management by people's participation to secure basic needs for local people giving priority to poor community and to reduce rural poverty by improving the well-being of the poor is frequently advocated in Nepal and elsewhere. The success stories of conservation are a few in number and time as well as space and sector specific. Moreover, equitable distribution of forests products within the rural community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated yet. Therefore, replicability of these experiments requires additional knowledge and adequate modifications according to the needs of the rural poor and country's overriding poverty reduction objective.

The forest resources in Nepal are important for subsistence as well as for commercial purposes. Nevertheless, decentralization policies have devolved to local users mainly in the use of those forest products that is important for subsistence. It is also suspicious why commercial powers are not devolved. What will be the hidden interests or fears behind the hidden politics of decentralization? Not only in Nepal but also in some other countries, the Forest Departments have retained significant control over how commercial benefits from the sale of timber will be realized and allocated (Agrawall, 1999). Forest policy of Nepal has given more emphasis on the conservation of community forests by providing equal access to non-wood forest product to meet subsistence needs only. It is evident that some users within a community, however, enjoy better access to all the forest product because they possess a relatively large amount of social and physical capital to appropriate and exploit the resources while the poorer users are not able to utilize the benefits from freely available of the entire non-wood forest product due to pervasive poverty and socio-economic inequalities among the rural households. Landless households cannot use leaf litter, fodder, and other agricultural tools for the purpose of subsistence needs. On the other hand, they do not realize any income from the equal harvesting of those forest products due to the lack of a legal provision to sell or trade in the market of these unused shares of forest products even when they could yield of potential income for the rural poor. Mainly landowner and wealthier (rich) households enjoy the benefits of these resources. Likewise, timber wood sold to FUG members at below-market prices is mostly purchased and used by elite members and wealthier (rich) households who have greater demand, ability to pay and dominant position in FUG

(Malla, 2000). This study examines this broad concern by investigating whether recent policy shifts since the 90's towards community-based forest resource management in Nepal have increased access of poorer households to community forest resources.

Thus, at a more general level, this research aims to verify the victim hypothesis by investigating to what extent community forestry has contributed to the household level welfare of poor people. Moreover, at a more specific level, this research aims to provide the empirical evidences of differential distributional impacts and externalities effects of community forest management on different caste and income groups of households at the local level.

1.2 Statement of the Problem

Loss of equity of forest resources to rural communities should viewed in relation to the irreversible loss of forest resources in the environment. Both of them have serious threat to the lives and livelihoods of millions of poor families. We should not forget to give more emphasis on environmental justice when we are considering the equity of resource distribution. The negative consequences of these may leads soil and slope erosion, desertification, global climate change, flooding, water pollution, biodiversity loss, rural out migration, and destitution of indigenous disadvantaged groups and marginalized section of rural peoples. Some of these adverse processes may be irreversible.

The potential of community forest management by people participation to secure basic needs of local forest dependent population would certainly improve the well-being of them has been frequently advocated in Nepal and elsewhere. However, due to the lack of true understanding about different linkages between absolute and relative dependency, equitable distribution of benefit and cost and extent of positive and negative externalities of forests resource management within the rural community especially across the different socio-economic groups of people has not been clearly demonstrated.

The strategy of poverty alleviation cannot succeed only in the face of persistent poverty and erosion of forest resources. Similarly, no strategy to conserve the forest ecosystem would be successful unless the needs of the least advantaged and most vulnerable sections of society including the forest dependent population are met. The general believe is that a balanced approach for conservation and management of local common property resources with the sole general goal of local development and with the sole aim of socio-economic upliftment of vulnerable sections of indigenous people including internalizing the externalities of commons by the forest dependent population can help reduce absolute poverty, sustainable development and environmental protection.

There is an increasing trend in restricting rights of access to forest resources for the rural poor after introducing the community forestry on which their livelihoods are deeply fastened. Therefore, policy efforts that hope to go beyond conservation by providing incentive to produce more forest products with its full capacity and to allow marketable access of surplus forest resources to utilize the basic forest benefits to enable all the poor households to realize the full value of the share of forest products available to them need to be urgently rethought.

Modifications in the community institutions would be required to ensure (a) more focus on (vulnerable groups), viz. indigenous groups, facing the danger of extinction; (b) greater representation and involvement of all groups in the community particularly the marginal groups; (c) harnessing the energies of the younger, more progressive, responsive and dynamic elements of the community (both male and female); (d) greater involvement of women; (e) greater accountability and transparency in their operations; and (f) greater democratization including women as voters (Tewari & Tewari, 1999).

Even if the community does receive benefits from the forest resource, an additional concern is the internalizing the externalities-sharing of benefits and costs within the community. Communities are heterogeneous including different economic class and caste groups along with gender disparity. It has been noted in Nepal that equity issues arise when not all of the users of a local forest are included in the CFUG, or if those who are not users are included, or if the needs of particular groups within the CFUG are not adequately considered (Hunt *et al*., 1996).

In recent time, the issues of poverty reduction and equitable distribution of forest resources in Nepal have come into focus for a number of reasons; rural poor households especially disadvantaged groups and marginalized people have less access today to forest products for subsistence use and income than they had before the community forestry intervention. On the other hand, either rules of CFUG or forest policy of government have given more emphasis exclusively on subsistence benefit from non wood forest products ignoring well being benefit from all form of forest resource which have greater and direct impact on rural poverty reduction. However, the past decade has witnessed an increasing emphasis on community-based resource management with a focus on poverty alleviation. The belief was that giving local user groups' formal property rights provides them with an incentive to manage extraction of fuel wood, fodder, and other forest products in a sustainable manner and community welfare will increase as a result of an increase in forest resources and halting degradation. But coming to date, despite having the most innovative policies to promote community-based resource management in place, community forestry in Nepal is said to be unable to reduce rural poverty and to

provide a significant contribution to the livelihood of poor and marginalized people due to its failure to take into account well being benefit approach for commercial use and equity of resource distribution within the resource using heterogeneity community in the society (Dahal, 2003).

Thus, at present the reliance by the poor on access to natural resources has still remained a key issue. Attacking poverty in rural areas is then necessarily a matter of improving poor people's ability to derive sustenance needs and income from more productively and sustainably managed natural resources. Although, these forest resources have exhaustible and/or degradable characteristics, they are renewable resources. They are declining with their overexploitation. So they require improved management techniques for resource users that continue to grow in both numbers and consumptive habits. Efforts to improve the management of natural resources, however, often focus narrowly on the technical characteristics of the exploitation or conservation of the resources while giving short shrift to the social and institutional structures that are needed to manage those resources in a more sustainable and equitable manner.

There has been comparatively little research on the nature and extent of inequalities within CPR institutions, problems of internalizing the externalities and their implications for different economic and social groups. This is an area that this study seeks to bridge this gap in understanding about how and to what extent different socio-economic groups of households are dependent on community forest despite recent policy shifts since the beginning of 90's towards community-based forest resource management in Nepal.

Thus, at a more general level, this research aims to test the victim hypothesis in Nepalese community forestry by investigating to what extent community forestry has been contributed to the household level welfare for the poor people. Moreover, at a more specific level, this research aims to provide the empirical evidences of differential distributional impacts and externalities effects of community forest management on different socio-economic groups of forest user households at the local level.

1.3 Objectives of the Study

This study aims to contribute towards an understanding of the relationship between rural poverty and natural resource use vis-à-vis the victim hypothesis, equity issues and externalities of community forest management. Community forestry policy assumes that allowing free collection and equal distribution rules of forest products favors poorer households. Thus, to what extent the propositions posed in this policy are true to be verified empirically to ensure whether Nepal's community forestry is towards increased access of poorer households to community forest resources.

The primary objectives of this research study are:

1) To review the theories of development and poverty-environmental/natural resource nexus
2) To analyze institutional mechanisms, property rights and distributional rules of community forest management
3) To verify empirically the victim hypothesis that whether those rural poor and lower caste or non-poor and high caste households depend more on natural community forest resources.
4) To examine the equity and externality issues of management of common property forest resources by employing benefit-cost analysis.
5) To provide suggestions including for policy implications.

1.4 Research Questions and Hypotheses of the Study

The above objectives lead to three important questions, which require setting three hypotheses corresponding to each research question.

The research questions and the working hypothesis are as follow:

Question 1. To what extent different wealth-ranked groups of households in CFUGs are more dependent on Natural Resources (Forest Resources) for their livelihoods?

The victim hypothesis of commons tells us that rural poor are more dependent on natural resources. However, harvesting of forest products as common pool resources, in absolute terms, contributes to add less implicit income to total household's incomes of the lowest wealth-ranked and caste group of household followed by middle and richer wealth-ranked and caste group of households. On the contrary, harvesting of forest products as common pool resources, in relative terms, contributes to add greater implicit income to total household's incomes of the lowest wealth-ranked and caste group of household followed by middle and richer wealth-ranked and caste group of households. This is the fundamental question of the victim hypothesis of commons, which this study has tried to seek the answer by verification of the following hypotheses.

Hypotheses 1. *Among the forest dependent rural households, the lower caste and poorer households are less dependent in absolute terms, but, more dependent in relative terms than the higher caste and non-poor households on Natural Forest Resources.*

Question 2. Who is benefiting more from Nepal's community forests?

This question refers to equity issues, access rights and distributional implication with interlocking forms of collective action with institutional regimes of community forestry among the different wealth-ranked and caste groups of rural population. Many studies show that the operational rules and social capital are important to overcome collective action problems (Agrawal 1998; Gibson et al. 1999; & Varughese 1998). The potential negative effects of population pressure; socio-economic factors and market related variables on resource base and equity issues are mediated by the rules enforcement mechanisms and level of social capital of a capable local common property resource management institution. However, giving defacto property rights only to CFUGs for the subsistence use by restricting the commercial use and other transferable rights of forest products to the poorer households has unlikely the asymmetry of forest resource distribution. This is the basic concern of the equity issues, which this study has tried to seek the answer based on following hypotheses.

Hypothesis 2. *Shifting institutional domain of defacto property right regime of forest resource management from state to local user groups, there is an asymmetry of forest resource distribution and the low caste and poor households benefit less from CF than the high caste and non-poor households.*

Question 3. What are the positive and negative externalities effects of CF on low caste/high caste and poor/non-poor households in terms of benefit accrued from and transaction costs incurred of community forest management?

This question concerns to explore and analyze the positive-negative externalities effects of community forest management and uneven distribution of benefit and cost of common pool resource management. The part of externality issues- negative externality in terms of transaction cost and positive externality in terms of benefit from community forest management is taken into account. These have differential impacts of actual benefits accrued and transaction costs incurred by different caste and income groups of households within the CFUGs. The CPR literature argued that defining property rights internalized the externality. However, the assumption of this study is that those high caste and non-poor households are benefiting more than the cost in comparison to the low caste and the poor households. Unless internalizing the positive externality in terms of benefits reaped and negative externality in terms of costs incurred by different socio-economic group of households within the

CFUGs, there would be remaining the questions about the likelihood of collective action, equity and efficiency issues in community forests. This is the main question, which this study has tried to seek the answer based on following hypotheses.

Hypotheses 3. *The negative externality of community forest management in terms of transaction cost may be higher for the low caste and poor households compared to positive externality in terms of benefits. Contrary to this, the negative externality of community forest management in terms of transaction cost may be low for the high caste and the non-poor households compared to positive externality in terms of benefits*

1.5 Significance of the Study

Many studies in the past have not systematically been carried out about poverty-CPR relation from the verification of victim hypothesis, externality effects and equity issues on community forest management in Nepal. Few of these have explicitly attempted to analyze the poverty-environmental resource based on downward spiral relationship and over looked at variations of changes of common property resource management by local people's institutions and their affects on rural poverty reduction with a view of equity of resource distribution and conservation across rural communities/villages. Though people's participation, property rights and decentralization in natural resource management are believed to increase efficiency of resource use and conservation, but their equity aspects and externality effects with potential economic benefits and cost sharing among the different socio-economic groups of households are rarely emphasized by the previous studies. All these lacunae of the previous studies have encourage to take initiation of this study assuming that efficiency gain may be insignificant relative to the loss of equity in such a persistent socio-economic inequality in the communities associated with communal property rights alone to access resources. If restricting effort for increasing harvesting of the resources is required in a given environment then one should look at the possibility of institutional strengthening to mediate enforcing such restriction with equity perspective.

The second argument of this study is that ignoring the positive and negative externality effects of community forest management on poor income class and low caste group, rest of the attempts of community forest management may be futile. The third argument of this study is that the basic policy objective remains only the fulfillment of subsistence needs is a big weakness that should be changed and go beyond subsistence attitudes taking into account of well being benefit approach. The fourth argument of this study is that only restricting the access to common property forest resources for the poor people through rules and policy structure is likely to increase the level of rural poverty. There is

need to go beyond subsistence attitude and the provision of basic forest benefits to enable all households to realize the full value of the share of the forest products available to them.

If income earning activities of community forestry is linked to identified targeted poor households with specific measures of compensatory transfer schemes, through the meditation by an effective local resource management institution which may likely be an assurance mechanism to safeguard the environmental justice and equity of resource distribution to the interests of the disadvantaged groups and most vulnerable section of the local community.

The final argument of this type of study is that the interacting link between rural poverty and environmental resource management focusing on externality effects and equity impacts on different income class and caste group in Nepal has not been systematically studied and well explored. The general belief is that management of common property resources by local community level ensures to enhance efficiency of resource use by making the overall forest green and dense. However, there is no clear evident that all local households benefit equally from this increased green and dense natural resources despite the provisions of equal common property rights to access these resources. Even though, there are some studies concerning the benefit-cost analysis of community forest management, little attention has been paid to the externality effects of community forest management and differential nature of returns to different groups within resource using local communities. Thus, the central issue of this research is to bridge this gap in understanding about how and to what extent the poor are dependent on community forests in Nepal. The primary question has been examined regarding whether poor and low-caste households are likely to face higher transaction costs of forest management than the higher-caste and richer households. The study tried to explore the factors of positive and negative externalities in local level common property resource management institutions which influence the efficiency of resource use, equity of resource distribution, sharing of transaction costs of resource management. In addition, this study aims to develop a methodology of benefit/cost estimation of direct use value of CF to explore how local collective action for resource conservation and management can lead to direct betterment of rural livelihood through more equal distribution of forest products utilization at the local level for policy makers.

1.6 Limitations of the Study

Every study has some scope that streamlines the main focus excluding all the irrelevant things from a specific single study. This study also is no exception from this. The present study has some limitations which are mentioned below:

Forest provides many potential goods and environmental services. Basically, forest resources have direct use value, indirect use value and option value (Bann, 2000). Direct use values are the resources and 'services' provided directly by the forest (e.g., wood products such as timber, Non-Timber Forest Product (NTFP) such as food and medicine, recreation and tourism, and human habitat).

Indirect use values are the environmental functions of the forest, which indirectly support economic activity and human welfare. These include air pollution reduction, watershed protection, microclimate regulation, nutrient retention, carbon storage, and biological diversity.

Option value refers to the option to use the environment in the future. Option value is like an insurance premium that individuals are prepared to pay to ensure the supply of something (i.e., the forest and its provision of multiple goods and services) the availability of which would otherwise be uncertain.

Among the aforesaid values of forests only direct use values of fire wood, fodder, green grass and litter rather than environmental service values are considered in this study for distributional concerns because these resources have been contributing significantly to rural subsistence household economy where perpetuated pervasive poverty is a common phenomenon.

The study is based on cross section data for a particular year only. Therefore, it cannot indicate the trends of distributional issues of forest resources among the different caste and wealth-ranked households in the community over the years.

Nevertheless, one of the limitations of this study is that being difficult to get time series data before community forest management when national forest was under the government control it could not be able to compare before and after economic impact of community forest management on different income classes and caste/ethnic groups in the study area.

1.7 Organization of this Dissertation

This research study has been divided into nine chapters. The first chapter deals with introduction comprising statement of the problem, objectives of the study, research questions, significance and limitations of the study. The second chapter presents conceptual framework and research methodology of the study including definitions and concepts and analytical framework. The third chapter includes review of the literature on theoretical and empirical works on poverty, inequality and distributional aspects of CPR management. The fourth chapter deals about the theoretical underpinnings of the study, reviews some hypotheses relating to poverty-environmental/natural resource nexus and

some leading theories of development, poverty and common property resource management. The fifth chapter contains data analysis. This chapter analyzes the socio-economic characteristics of forest dependent rural households.

In addition to a description of the problems associated with CF management in Nepal, chapter six is confined to discussion on the property rights structure over forest resources, institutional mechanism of CF regarding provision rules on forest products harvesting, detection and graduated sanctions, collective-choice arrangements, conflict-resolution mechanisms and monitoring systems. Besides, Forest Act 1993 and Forest regulations 1995 have been critically analyzed in this chapter. Chapter seven is devoted to testing the victim hypothesis into the CF presenting different types of forest products harvested by different castes and income groups and the prevailing disparities in it. This chapter examines income distribution patterns of community forests by different castes and income groups to find out the absolute and relative dependency of each income and caste group on CF. In addition, an attempt has been made to examine the determinants of income inequalities from CF with the help of econometric analysis.

The eighth chapter analyses cost structure of use and management of community forest and examines cost sharing pattern of CF management by different caste and income groups of households. This chapter examines the positive and negative externality effects (in terms of gross income accrued from and transaction cost incurred of community forest management) on different income classes and caste/ethnic groups. Based on gross benefits accrued from and gross cost incurred of CF management by different income classes and caste groups, this chapter reports the results of net benefits and benefit-cost ratios obtained from benefit-cost analysis. The final chapter (ninth) is comprised of summary, conclusion and policy recommendations. It is concluded that unless equalization between income accrued from and cost incurred of CF management (internalizing the externalities) to/by all the household members of CFUGs, the assumption of policy led community forestry to allow free collection and equal distribution rules of different forest products has unlikely to belief.

CHAPTER 2

2 CONCEPTUAL FRAMEWORK AND RESEARCH METHODOLGY

2.1 Definition and Concepts

The operational definitions and concepts of the key words used in this research study are as follows:

Poverty: Poverty refers to a state of absolute or relative lack of fulfillment of basic human needs in the contemporary context. Besides looking into the ability of a household to meet basic consumption needs (income/expenditure approach), this study has encompassed the insight of a multidimensional concept of poverty, which covers economic (landholding and household income), human (education and health) and social (values-norms-kinship and influence) aspects of an individual or household in the society. However, the study has estimated the poverty level by ranking the households of study area into three wealth-ranked groups with the help of PRA technique so that information from various indicators could be fetched and integrated to understand the true scope and extent of poverty in a rural context.

Natural Resource: Natural Resource refers to different forest products particularly: fuelwood, fodder and green grass, green leaf litter and dry litter, timber for housing, construction of animal shed, agricultural implements, pools and branches of trees for vegetable production and circle wall that are most related to the fulfillment of daily subsistence needs of forest dependent rural households.

Common Property Resources (CPRs): Common property resources (CPR) refer to different types of tangible forest products from community forest. CPR as non-rival and nonexclusive public goods is not free access to anyone due to rival in consumption and possibilities of free rider problems. More harvesting from CF by anyone reduces the stock of resources that affects the opportunities of others making less available of forest resource for others. This leads to rivalry. If CPRs let free access to anyone, over harvesting by everyone collapses the stock of resources that affects the environmental/natural resource degradation. This leads to free rider problems. Thus, to solve the problems of rivalry and free rider on commons, users of a CF are charged for the entrance into the CFUG as a membership fee which leads to excludability.

Community Forest: Community forest refers to an area of forest that is handed over to the identified user community by District Forest Office (DFO) on behalf of government for management of forest.

Community Forest User Groups (CFUGs): Community forest user groups refer to functional institutions at the sub-village grass roots level without administrative boundaries through which all CF activities have been conducted.

Household: Household refers to a group of family members normally living together under one roof as one family and sharing common kitchen.

Household Income: Household income refers to sum total of current income of all members of the household from all sources. It consists of farm, non-farm and CF income.

CF Income: CF Income refers to the income from community forest.

Benefits: Benefits refer to the gross value of different forest products in monetary value.

Non-CF Income: Non-CF income refers to the various income sources except the income from community forest.

Labour Cost: Labour cost refers to the cost of time directly associated with finding, extracting, processing and transporting different types of forest products from the forest areas of CF.

Transaction Cost: The Transaction cost refers to costs of decision making activities, implementation activities and monitoring activities in community forestry.

Externalities: The situation in which the costs of producing or consuming a good spill over into those who are neither producing nor consuming the good. Here the term "externalities" refers to a situation in which the benefits and costs of community forest management spill over into income classes (poor and non-poor) and caste/ groups who have similar and common participation in community forest management activities. Externalities can be negative when the action of any one income class/caste group imposes costs on another income class/caste group or externalities can be positive when the action of any one income class/caste group benefits to another income class/caste group.

Positive Externality: The situation in which the benefit spill over into some one not involved in producing the good.

Negative Externality: The situation in which the cost spill over into some one not involved in producing or consuming the good.

Property Rights: It refers to the legal rules regarding a secure claim to forest resources to every one who is a member of an identified forest user group.

Public Goods: Goods that benefit all users or consumers at zero marginal cost and no one can be excluded from enjoying them. It has three characteristics: non-rivalry in consumption, nonappropriatility, and nonexcludability. For example, the national defense and public

television are both nonexclusive public goods and people cannot be excluded from consuming them. Similarly, they are also nonrival public goods because their use by additional persons adds nothing to their running costs nor reduces the benefits that others receive from these goods due to the zero marginal cost of providing defense or viewing public television to the additional persons.

Inequality: Inequality refers to the unequal earnings and distribution of CF income and non-CF income among the different income class and caste groups in the study area. Unequal earnings are due to unequal opportunities, unequal abilities, unequal ownership of assets and many other institutional factors.

Equity: Equity refers to the equal distribution of different types of forest products from CF and equal sharing of different types of costs of community forest management.

Absolute Dependence: Absolute dependence refers to the contribution of gross CPR income from CF to total household income.

Relative Dependence: Relative dependence refers to the percentage contribution of CPR income from CF to total household income.

Unemployment: Unemployment is a situation when a person fit to work and willing to work does not get work at the prevailing rate of wage even after their best possible efforts.

Under-employment: Under-employment is a situation when persons are engaged in works/jobs at a wage rate that is lower according to their qualifications and abilities. All those persons are considered to be under-employed if they are forced to take a job that is not adequately remunerative or not commensurate with their skill, abilities and training. According to time criterion, under-employment is a situation when persons are either gainfully occupied during the year for a number of hours (or days) or less than some normal or optimal hours (days). According to the willingness criterion, workers are under-employed if they are willing to do more work than they are doing at present.

Literate: Those members of the family who can read and/or write have been considered as literate.

Opportunity Cost of Labour or Time: It refers to the alternative opportunities available for work to labour or time that is better than the existing work of labour or time.

Agent Hypotheses: An agent hypothesis is that one in which there is a mutual and spiraling relationship between poverty and environmental resource degradation. A central premise of this hypothesis is that poverty leads to degradation.

Victim Hypotheses: A victim hypothesis is that one in which poor people are more directly dependent on biological resources for their livelihood than richer people. Loss of

flora and fauna is thus relatively more costly to poorer segments of society. Furthermore, poor people often are compelled to settle near these resources commonly found in open access areas to be exploited at family-labor costs only.

Internalization of Externality: Internalization of externality refers to the internalization of benefits from and costs of community forest management.

Communal Ownership: Communal ownership refers to the ownership of community forests by all the authorized users of an identified CFUG.

Distribution: Distribution refers to the sharing of different types of forest products and CF income and non-CF income among different income class and caste groups.

Gross Value (Benefit): Gross value (benefit) refers to all harvested different forest products by the users from the community forests in terms of monetary value.

Net Value: Net value refers to the gross value (income) accrued from different types of forest products from community forest subtracting the labour costs, transaction costs and membership fees incurred from the management of community forest by forest resource user households.

Benefit-Cost Ratio: Benefit- cost ratio refers to the benefits divided by costs.

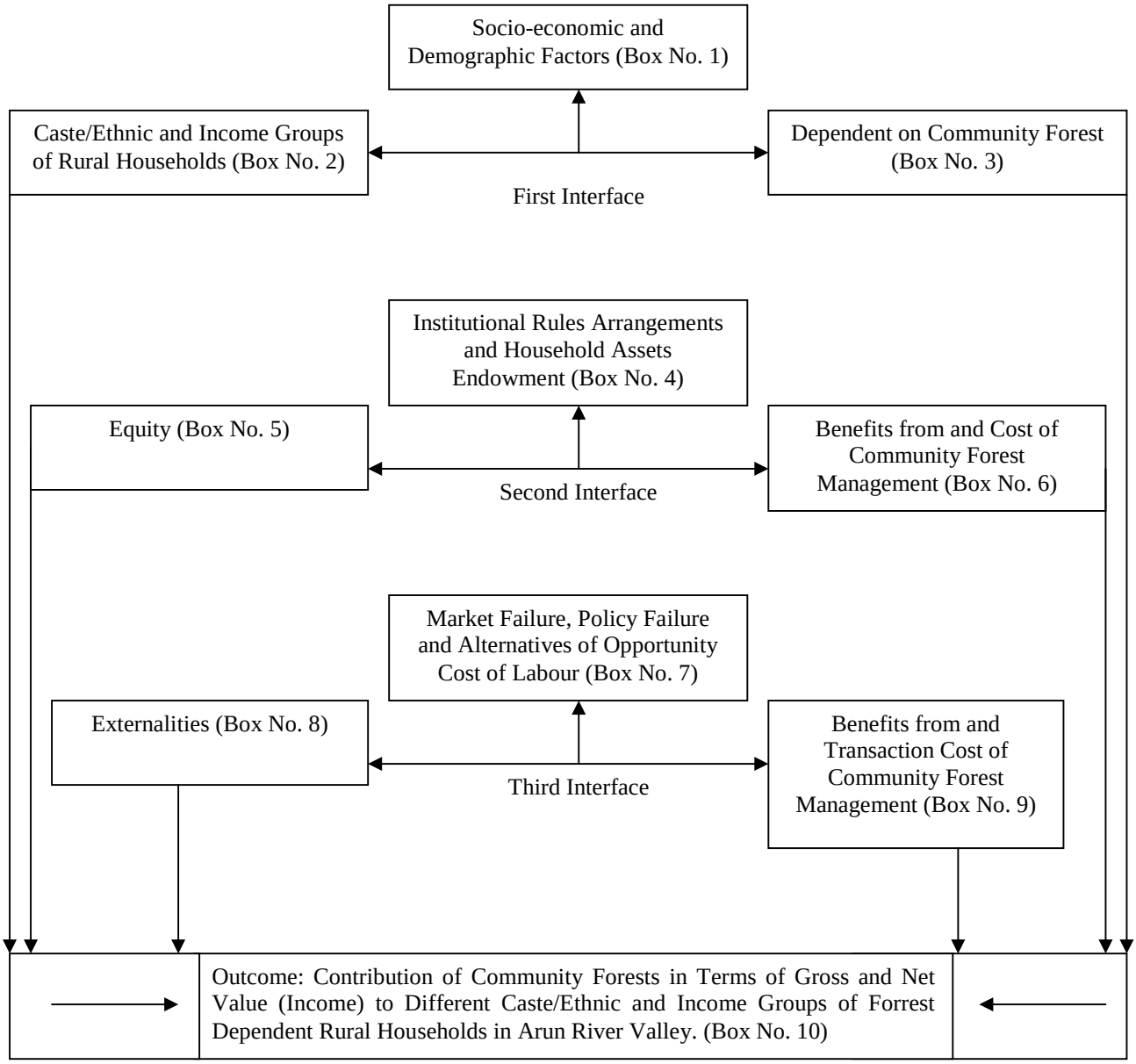
Market Failures: Market failures mean that the forest products are undervalued in the market place; at the same time as for forest services, there is usually no market place. It occurs due to absence, distorted or malfunctioning markets in which forest goods and services are undervalued or not valued at all.

Policy Failures: Policy failures also mean that the forest products are undervalued in the market place, while for forest services there is usually no market place. It occurs both when the state fails to take action to correct market failures, and when policies are implemented which further distort prices and cause disincentives for sustainable management.

2.2 Analytical Framework-Socio-Economic Diversity and Common Property Resource Use: The Interfaces

The relationship between heterogeneous socio-economic groups and common property natural resources in the context of community forest utilization and management by the users of 16 CFUGs at household level on equity issues has been investigated through three interfaces (see Figure 1). The analytical framework of research work is conceptualized based on the three interfaces first and then attempts have been made to provide evidence on the basis of primary data collected to establish their empirical validity in the study area.

Figure 1
Caste/Ethnic and Income Groups of Households and Community Forest Resources - the Interfaces



2.2.1 Caste/Ethnic and Income Groups of Households and Dependence on Community Forestry: The First Interface

The first three boxes (1, 2 and 3) from the top define the first interface. The extent of dependency on CF varies due to socio-economic differences within the CFUGs. Resource use behaviors of different social caste/ethnic group and economic group of households affect sustainability of community forest resources through different ways; unrestricted entry, preferences over forest type harvest, ignorance of resource appropriation and lack of survival choices and economic options, etc. Note that it is not necessarily the stock of forest that declines but it may very well be the case that non-poor

people share more a given stock. When sustainability of the community forest resources is affected it also accentuates rural poverty. This is the basic argument put forward by those who believe that most of the rural poor live in biomass-based economy (Dasgupta & Mäler, 1994) where the sustainability of the biomass affects the sustainability of the livelihoods of the rural population, particularly the poor. When the livelihoods of the rural poor are therefore threatened, they make things worse by adversely affecting the quality and quantity of the biomass. Demographic pressures and socio-economic differences affect this interface as shown by the first Box 1. Thus, the first interface tries to analyze to what extent different caste group and income class of households depend on community forestry. This interface also seeks to analyze the low absolute dependency and high relative dependency on natural forests by the poor households just the opposite to the non-poor households. An attempt has been made to provide empirical support for the first interface by examining the first hypothesis as stated in chapter one.

2.2.2 Equity issues and Community Forest Management: The Second Interface

The second three boxes (4, 5 and 6) following the first three boxes constitute the second interface. It relates equity issues of forest resource distribution in terms of benefits from and cost of CF management among different income and caste groups. The forest resources are important for subsistence as well as for commercial uses. Nevertheless, forest policies have devolved to local users mainly the use of those forest products that is important for subsistence. Forest Department on behalf of government has retained significant control over how commercial benefits from the sale of timber will be realized and allocated. Thus, forest policy of Nepal has given more emphasis on the conservation of CF by providing equal access to non-wood forest products to meet subsistence needs only. It is evident that some users within a community, however, enjoy better access to all the forest products because they possess a relatively large amount of social and physical capital to appropriate and exploit the resources while the poorer users are not able to utilize the benefits from freely available of the entire non-wood forest products due to the pervasive poverty and socio-economic inequalities among the rural households. Mainly landowner and wealthier households have been enjoying the benefits of these resources. Landless households cannot use leaf litter, fodder, and other agricultural tools for the purpose of subsistence needs. At the same time, costs of management in terms of transaction cost fall heavily on the poor. On the other hand, lack of commercial access rights and absence of transferable property rights they do not realize any income from the equal harvesting of those unused share of forest products even when they could yield of potential income for the rural poor (Malla, 2000). By implication, the rural poor have either to harvest forest products in marginal forest areas

of inferior quality or live in vicious circle of poverty. Likewise timber woods sold to CFUG members at below-market prices is mostly purchased and used by elite members and wealthier households who might have the membership of more than two community forests and have greater demand, ability to pay and dominant position in CFUG.

Thus, the assumption that allowing free collection and equal distribution of forest products (e.g. fodder, green grass and leaf litter) favors poorer households has been examined from the equity perspectives in this second interface. Various forms of institutional arrangements regarding access rights, decision making, control and benefit – cost sharing factors have greater influence as shown by the second interface in the box no. 4. Thus, this interface has tried to seek to what extent equity issues of community forestry affect the livelihoods of the rural poor and non-poor households who are depended on and involved in community forestry activities. Despite having the institutional rule arrangements with defined property rights, there is not any sign of equal distribution of forest resources due to differential impact of benefit cost sharing of CF on different caste and income groups of households within CFUGs. Thus, attempts have been made to provide empirical support for the second interface by examining the second hypothesis as stated in chapter one.

2.2.3 Externalities of CF in Terms of Benefits from and Transaction Costs of Community Forest Management: The Third Interface

The third set of three boxes (7, 8 and 9) following the first interface and second interface have constituted the third interface. It has made an effort to find out the externality of community forest in terms of benefit from and transaction costs of community forest management. This interface tries to analyze the high negative externality and low positive externality to have poor households just opposite to the non-poor households. Externality in this context is related to the effects of various forms of benefit of forest (for example, consumption benefits for subsistence purpose, which leads expenditure saving and well being benefits for production purpose, which leads income earning activities) in a variety of forest harvesting. On the other hand, externality is related to the effects of transaction costs associated with management of community forests.

Thus, the third interface tries to explore and analyze the reasons behind the observations of the victim hypothesis and equity issues of community forests. The first hypotheses examined that whether the survival and livelihoods of rural poor dependent more on natural forest resources. The second hypotheses also examined the equity effects of forest resource distribution based on benefit-cost analysis of community forests showing the differential impacts of actual benefits accrued and costs incurred by different wealth-ranked and caste groups within the CFUGs. Institutional rule arrangements and various

forms of household assets endowment owned by rich income class and high caste group that have greater influence on the second interface as shown by the Box 4 may be the prime reason for high benefits of CF to rich and high caste households compared to poor and low caste households. Market failure, policy failure and potential of alternatives of opportunity cost of labour availability out side the CF considered as principal reasons to have greater influence on the third interface as shown by the Box 7. Attempts have been made to provide empirical support for the third interface by examining the third hypothesis as stated in chapter one.

To make the high opportunity cost of labour within the CF, there are potentials of local market opportunities due to the purposed valley access road (Hile-Bhojpur road), which may affect not only income earning activities but also might lead to the incentives to open forest based industries that have placed substantial demand on local resources and employment generation. At a more general level poverty, income inequality, access to subsistence and well being needs with sustainability of CPR are the important determinants of the conditions of the rural poor who are pursuing this livelihood. Unless making the high opportunity cost of labour within and out side the CF, as shown in Box 7, to optimize the alternative economic opportunities of rural access road, market incentives along with the socio-political processes within which local livelihood is pursued and rely exclusively on institutional dealings as shown in Box 4, persistent poverty in rural Nepal is likely to increase over time. At a more specific level, it is assumed that there is an increasing trend in low dependency and access to resources for the rural poor than non poor as shown in first interface on which the equity issues as shown in second interface and externalities of CF as shown in the third interface are deeply fastened. Therefore, policy efforts that hope to go beyond subsistence conservation within CF and provision of commercial production in a sustainable way that have greater opportunity cost of labour within the CF may be possible policy implications for major outcome indicator: contribution of CF in terms of gross and net value (income) to forest dependent rural households from community forest management in Arun River Valley as indicated in the box no.10. This framework suggests that factors such as socio-economic, demographic, institutional and opportunity cost of labour within and out side CF through the mediation role of local common property institutions are vital to address the poverty–natural resource relation.

2.3 Research Methodology

Keeping in view the objectives of the research, the study has followed the following methodology:

2.3.1 Study Site

2.3.2 Sources of Data

2.3.3 PRA Technique and Household Survey

2.3.4 Statistical Tools

The study site including socio-economic status and forest condition, PRA techniques to distinguish poor and non-poor households and to reach consensus regarding user's price and barter game prices of different forest products, working hour in a day and average daily wage, etc. and sampling procedure for household survey, statistical tools to estimate the household level benefits and costs of community forests including multiple regression model are presented in detail in the subsequent sections.

2.3.1 Study Site, Socio-Economic Status and Forest Condition

The study was under taken in two selected districts of the eastern hilly Arun river valley of Nepal where participatory forest resource management under the user's group concept has been implemented for the last fifteen years. Fourteen CFUGs from Jarayotar, Yaku and Chharamwi VDCs of Bhojpur district and two CFUGs from Leguwa VDC of Dhankuta district in the Arun valley were selected. Out of the 16 CFUGs, two FUG-namely Shivaratrighat and Barnebelayate lie in Leguwa VDC of Dhankuta district, one FUG namely Chhyangripasini lies in Charammwi VDC and rest of the 13 CFUGs lie in Jarayotar VDC of Bhojpur district. Thus, these all VDCs and CFUGs lie in lower part of Arun river area. All the CFUGs from the Jarayotar VDC were chosen for the study because these CFUGs have relatively more socio-economic heterogeneity.

Arun river valley lies in the Eastern Development Region of Nepal. From the watershed viewpoint it covers most of the areas of three districts under Kosi zone: Sankhuwasabha, Bhojpur and Dhankuta. The Arun River flows from the Tibet autonomous region of China through the Himalayan ranges of Sankhuwasabha district into the Koshi hilly districts Bhojpur and Dhankuta and finally merges into Tribeni (the meeting point of three rivers, namely Arun, Tamor and Sunkoshi). It is 510 km. long from Tibet to Nepal but it flows only 155 Km in Nepal. The catchment area of Arun basin is about 36,500 sq.km, of which over 85 percent lies in the Tibet and on area of 5,028 sq.km. representing 14.17 percent lies in Nepal (Shrestha, 1989).

Arun river valley is one of the typical areas of Nepal in terms of physiography, environmental resources and local diverse inhabitants. The major landform features are deep river valley and *tars* (river terraces) in the low elevated part, undulating hill slopes including a series of terraces in middle part and hill ridges together with snow peaked

mountains in higher parts. The valley can also be divided into two board regions based on its location and distances- Northern Arun Valley and Southern Arun Valley. The Northern part covers the high Himalayan area above 2500 m and most parts consist of slope of more than 40 degree. The temperature varies warm to alpine to arctic and is very thinly populated. The Southern part covers middle Mountain and hilly areas predominantly. Here, the climate ranges from hot, dry subtropical to warm and moist temperate leading different agro-ecological condition together with dense population. (Central Department of Geography, T.U., 1999). On the basis of vegetation types and corresponding altitude six-bioclimatic zones- Tropical Zone (below 1000-meter), Sub-tropical Zone (1000 to 2000 meter), Temperate Zone (2000-3000 meter), Sub-alpine Zone (3000-4000 meter), Alpine Zone (4000-5000 meter) and Nival Zone (5000 meter and above) have been identified in Arun River Valley (Shrestha, 1989). Ohsawa et al. (1973) also have classified the Arun Valley into five zones as Shorea zone, Schima-castanopsis zone, Quercus zone, Acer zone and the Abies zone. According to this criterion the proposed study site falls under the first and second bio-climatic zones. So it may be relevant to focus more on socio-economic and bio-climatic characteristics of these two zones.

Below 1000-meter altitude tropical zone appears where the dominant plants species are shorea robusta (*sal*), pinus roxburghii (*khote salla*), lagerstroemia, duabanga and terminalia. The tropical area according to LRMP maps (1978/79) covers about 1,347 km (22.7 percent) of the total area covered by the three districts Sankhuwasabha, Bhojpur and Dhankuta). Forest coverage and population density per k.m. are estimated to be 8.3 percent and 11.5 percent respectively. The Sub-tropical Zone lies in between 1,000 to 2,000 meter, which is characterized by the occurrence of schima wallichii (*chilaune*) tree. This zone has 1,997 k.m. of land area ((34 percent) of which only 9 percent is under forest cover. Population density of 133.4 person per k.m. (37.2 in Sankhuwasabha, 127 in Bhojpur and 145 in Dhankuta) (CBS, 1986) indicates that this zone has relatively high population pressure on agricultural land and forestland as well. Dobremez and Shakya (1975) identified 30 types of vegetation in eastern Nepal of which six types are represented in this zone. However, only three different types of forest, i.e., coniferous forest dominated by *pinus roxburghii*, broad-leaved forest dominated by *shorea robusta* and broad-leaved and coniferous mixed forest, were observed in the study areas. According to the Land Resource Utilization Map Project (LRMP) report 1978/79, the land uses of the Arun River Valley are categorized as cultivated land (25.4 percent), forestland (34.5 percent), shrub land (15.9 percent), grass land (14.7 percent) and waste land (9.5 percent).

Different castes and ethnic groups inhabit Arun Valley. Indigenous Kiranti ethnic group largely dominates this area and due to this fact, this part of Eastern Hill is historically known as "Manjh Kirant". The Kirant region was divided into two sections on either side of the Arun river i. e. 'Khumbuan', lying to the west (Bhojpur district), and the 'Limbuan', lying to the east south (Sankhuwasabha and Dhankuta district). The 'Khumbuan' is dominated by 'Rai' people and the 'Limbuan' by 'Limbu' people. However, the lower part of the Arun Valley (the study site) Brahmins, Chhetris and occupational castes of the Hindu society are living together with Rais and Limbus. Thus, Sherpas and Bhotes inhabit the upper Arun Valley. Rais and Limbus dominate the middle mountainous region. People typical of Hindu culture such as Brahmins Chhtris, Newars and Dalits with substantial number of Rais are living together near the lower part of the Valley bottom and low lying terraces. The study site, in fact, is evidence of not only multi-ethnic characteristics of habitants but also socio-cultural and economic heterogeneous nature, markedly exist. For the purpose of the household level analysis an attempt has been made to distinguish the village households into four castes groups such as Brahmins/Chhatris, Newars, Janajatis and Dalits and three wealth-ranked groups such as poor, medium and rich groups of households from each castes group so that perceptions and expectations of such a diverse population towards the local environment, extent of CPR needs, rules of use and management and their potential livelihoods could be addressed systematically in ground reality.

The study site including all the areas of Arun Basin has a subsistence farming economy with very limited options of non-farming activities for livelihoods where forestry and livestock are integral part of the agriculture system. Crops are grown up to 4000m. in altitude where the main crop are nude barley and potato. Yak, Yak hybrids, sheep and goats are pasturing in such a high altitude area. The main agricultural activities take place at low altitude areas (the study area) and middle altitudes from below 1000m. to 3000m. There are two basic cropping patterns: paddy-based for irrigated land and maize-based for rain-fed land. Average land holding is 0.5 hectare per family and the yield of crops i.e. paddy, maize and millet has been decreasing (Central Department of Geography, T.U., 1999)

All accessible forestland in the study area are in a semi natural condition surrounded by agricultural land and a varying degree of succession under the local community based group management regime. However, all forests under control and management by different user groups are apparently under heavy pressure even to meet primary needs of forest products for local households.

2.3.2 Sources of Data

In Nepal, there is lack of time series data relating to forest resource use by different wealth-ranked households before and after shifting institutional domain of defacto property right regime of forest resource management from state to local user groups. Therefore, cross-section primary data of different caste and income groups of households after the community forest have been used in this study. Thus, the present study primarily relies upon primary data, which were collected by researcher with two-research assistant based on the objectives, in order to examine empirically the hypothesis posed in section one, correspond to each research question categories.

However, in addition to primary data, the other necessary secondary data on institutional arrangements with regard to appropriation of forest products and provision rules, detection and graduated sections, collective-choice arrangements, conflict regulation mechanisms and monitoring systems have been compiled from various operational plan and written documents/minutes of each CFUG. Other important information has been used as and when necessary from various publications of HMG/NPC/CBS and other research centers and professionals. The study has followed the following methodology for data collection and analysis

2.3.3 PRA Technique and Household Sample Survey

2.3.3.1 PRA Technique

Participatory Rural Appraisal (PRA) refers to enable local people to share, enhance and analyze their knowledge of life conditions, to plan and to act. The existence of PRA technique appeared by the works of (Chambers, 1989, 1992, 1995; Chambers & Conway, 1992; IIED, 1992; Norton & Stephens, 1995). Since the mid 90s, the World Bank had undertaken this technique on participatory poverty assessment in sub-Saharan African countries such as Benin, Burkina Faso, Cameroon, Central African Republic, Eritrea, Ghana, Guinea, Kenya, Madagascar, Mali, Mozambique, Rwanda, South Africa, Swaziland, Uganda, United Republic of Tanzania and Zambia (World Bank, 1996). The World Bank's poverty report of 2000 was completely based on PRA methods (World Bank, 2000). Now it has been applied world-wide taking the philosophy of people-centered vision in place of sophisticated quantification and cosmetic approach on a range of research perspectives, including activist participatory research, agro-ecosystem analysis, applied anthropology, farming systems research and rapid rural appraisal. In Nepalese context several authors on commons have used this technique in their research studies. (Fox, 1983; Graner, 1996; Richards et al., 1999; Varughese et al., 2000; Bhattarai et al., 2001; & Adhikari, 2003).

Theoretically, PRA is guided by nine underlying principles (UN, 1998):

1. **A reversal of learning.** The aim is to profit from local knowledge directly on site through face-to-face contact.
2. **Learning rapidly and progressively.** Learning is to proceed flexibly by adapting to local realities and not imposing a predetermined research blueprint.
3. **Off-setting biases.** "Rural development tourism" is rejected in favour of an approach that stresses listening, not lecturing, being relaxed and not rushing, being unimposing instead of important, and actively engaging the views of women and the poor.
4. **Optimizing trade-offs**. Excessive (and apocryphal) precision of measurement is rejected and greater attention paid to the costs and usefulness of different types of knowledge accumulated.
5. **Triangulation**. The use of a range of different research techniques and investigators is proposed to facilitate cross-checking and enhance research validity/reliability.
6. **Seeking Diversity.** Research focuses on and accentuates contradictions, anomalies and differences, with a view to doing justice to the complexity of social phenomenon.
7. **Facilitating.** The role of researcher is to facilitate a process of investigation conducted by local people themselves.
8. **Self-critical awareness and responsibility.** It is incumbent on the facilitator to continually reassess and to accept responsibility for his own interventions, with a view to identifying errors and improving performance.
9. **Sharing.** Emphasis is placed on disseminating and sharing ideas among and between local people, facilitators and different organizations.

In a study site of rural hills areas such as Arun River Valley, where the traditional methods of poverty portrayal, measurement, and identification are not able to capture the distinctive nature and causes of poverty. It is recognized that poverty is a multidimensional concepts. It encompasses both the welfare levels and capabilities (IFAD, 2001). So far as the conventional measure of poverty is concerned, it disregards the capabilities and human development aspects of population, particularly in rural hills of Nepal where inaccessibility, fragility, marginality, underdevelopment, vulnerability, viocelessness, etc., are common to a greater degree in addition to low income. Therefore, it is assumed that those poor households in income-consumption terms are poor in

above-mentioned aspects as well. Thus, a PRA technique is justifiable and it was applied to distinguish all the households into four major caste groups and three wealth-ranked groups for realistic assessment of poor and non-poor households based on multidimensional local criteria. Some questions are asked to the participants in the PRA group discussions held at each CFUG to distinguish all the households into three different wealth-ranked groups such as poor, middle and richer households based on local criteria that participant villagers consider as important for assessing an individual household's socio-economic status in that area. (Fox, 1983; Richards et al., 1999; Varughese et al., 2000; Bhattarai et al., 2001; & Adhikari, 2003) have used similar criteria for categorizing households into different wealth-ranked groups. The main criteria used for the categorization of households into three income groups were the land holding, livestock holding, loan giving and taking and household income received from non-agricultural activities. In addition, the quality of land ownership and food sufficiency were also taken seriously as a basic indicator in PRA discussions. Regarding for the categorization of households into three income groups based on these criterions, consensus were made in PRA discussions that those households who own less than 0.5 hectare, 0.5-2 hectares and more than 2 hectares of household level land were identified as poor, middle and rich income households respectively. Likewise, marginal number of livestock holders such as goats, pigs, cows and chickens were identified as poor households. Owner of buffalos, cows and ox including goats, pigs, and chickens were considered as middle-income households. Those own larger quantity of buffalos, cows and ox including goats, pigs, and chickens than the middle and the poor income households were considered as richer households. Loan taking from local moneylender for family survival were considered as poor households. Loan taking sometime from local money lender to fulfill the occasional ceremonial needs rather than survival one were considered as medium level households. Rent and interest seekers by providing land in rent out and money to local needy households were identified as richer households. Under the food sufficiency criteria, four time periods were classified such as less than six month, less than one year and more than one year and discussion were made whether their own household production was sufficient for less than six month, less than one year and surplus or more than one year. The households with food sufficiency for less than six-month were considered as poor households. The households with food sufficiency for less than one year were considered as medium households and the households with food sufficiency for more than one year were considered as richer households. Nevertheless, this categorization should be viewed in relative terms in view of the fact that majority of the households were subsistence farmers in the study area

with few households having earning opportunities outside agricultural and non-NRM activities.

2.3.3.2 Household Sample Survey

Compiling a census of all households under the community forest user groups, a stratified sample was chosen for household survey. Household level data on socio-economic, demographic and the institutional variables including use and management of CPR in community forests was collected through a survey of 400 households out of total 1224 households from16 CFUGs in four VDCs of two districts in Arun Valley. A summary of surveyed stratified sample of households by different caste and wealth-ranked groups from 16 Community Forest User Groups in Arun River Valley is presented in the Annex Table 1-A

The Annex Table 1-A depicts the household sample represented the average of 32 percent of total households from each CFUG vis-à-vis each wealth-ranked group from each caste/ethnic group of households in a proportional basis of the study area as a whole. The household survey was conducted with the help of two-research assistants for a period of six months from October 2002 to March 2003. Household level questions were asked to obtain necessary information on three general areas: a) socio-economic and demographic information b) institutional regime of community forest use and management and c) Quantity of household labour involvement in different obligatory forestry collective activities and harvesting of definite amount of different forest products from community forests. The fieldwork was supplemented by one short visit in December 2003 to clarify various concerns and some confusion rose during the initial household survey. Out of 400 questionnaires one was excluded from the final analysis due to its incompleteness.

2.3.4 Statistical Tools

2.3.4.1 Estimation of Household Level Benefits (Income) from Community Forests

To estimate the household level benefits/income from community forests, methods of calculation regarding household level gross and net value/benefit (income) derived from community forests is presented here. Household level benefits derived by the local different wealth-ranked groups from community forest managed by local users were calculated by valuing the different forest product collected and harvested from forest areas. The economic value of different forest based products such as fuel wood, fodder, green grass, dry litter, green leaf litter, small tree pool for vegetable and timber for plough, house and animal shed construction by local user households were estimated. In

the entire study site, these all are the potential forest products which significantly contribute to the local level household economy. Methods of calculation regarding household level gross and net value/benefit (income) derived from community forests are discussed detail in subsequent sections.

Gross economic value of different forest products is calculated by multiplying the quantity of forest products harvested by the price of respective products minus cash cost like direct cash payment to CFUG as entrance fees for initial membership and if any other monthly membership fees. Hired labour to collect the forest product was completely absent. So cost of such labour has not been considered here. Due to the climate changes, different rule of user groups and seasonal agricultural farming activities, information of the amount of different forest products collected by the local user however, varies with the seasons was collected for 12 successive months. Considering all sites, green fuel wood harvesting was a restricted activity that could only be harvested once or twice a year for a fixed period of time. Fuel wood and other forest products could not be harvested for commercial purpose.

To estimate the economic value of different forest products the market price, barter method and opportunity cost approach were used. Gunatilake, 1998; & Adhikari, 2003 estimated the economic value of fuel wood consumed at home was valued at retail price in the village or forest gate price. This study has also estimated the economic value of fuel wood based on retail market price prevailing in local market (Shibaratri Ghat).The economic value of fodder, green grass and dry and green leaf litter were valued by the barter game methods. Similar methods were used by Godoy et al., 1993; Richards et al.., 1999; & Adhikari, 2003 in their studies. In order to carry out the barter game method, the user of participants in group discussion were divided into two groups, i.e., buyers and sellers, with buyers purchasing fodder, green grass and dry and green leaf litter in exchange for a local goods which had a well-known local market value (Richards et al., 1999; & Adhikari, 2003). In this exercise, buyers were given a bag of maize and the sellers were given a bundle of fixed unit of each (one head load of a *bhari*) of fodder, green grass and dry and green leaf litter. The participants were asked to discuss within their group about the quantity of maize they deserved in exchange for these different forest products. Finally, they actually exchanged the products for a fixed quantity of maize after a consensus was formed between all members within the group. Thus, the value of one head load tree fodder = 1.2 kg maize, one head load cut grass = 1.3 kg maize, one head load green leaf litter = 1.0 kg maize, and one head load dry leaf litter = 1.2 kg maize was derived through such type of barter game exercise since the market value of maize was well established (NRs 15/ kg maize). Thus, the following method

was established to calculate the economic value of the household level benefit/ income from CF.

All harvested different forest products as mentioned above by users from the community forests are considered as benefits. Gross benefit (economic value) of firewood is calculated by multiplying the quantity of firewood (per head load (*bhari*) by the local market price (Rs.35/ per head load). Gross economic value of tree fodder, cut grass, green and dry leaf litter were calculated by multiplying the quantity of each harvested forest products per head load by the barter game prices- Rs.18 /head load, Rs.20/head load, Rs.14/head load, and Rs.18/head load respectively. Gross economic value of tree branch (*teka*) was calculated by multiplying the quantity of tree branch (*teka*) by user's price Rs.18/N. Similarly, Gross economic values of timber for house and animal shed construction were estimated based on local market price. Gross economic values of Sal timber were calculated by multiplying the cubic feet by local market price Rs 500/ cubic feet and non-Sal timber were calculated by multiplying the cubic feet by local market price Rs 150/ cubic feet. Gross economic value of other Sal woods-long pole and Small pole- (*balo, garalo, valsi* were calculated by multiplying the quantity by local market price Rs 500/N and Rs 300/N respectively. Similarly, gross economic value of other non-Sal woods- long pole and Small pole-(*balo, garalo, valsi*) were calculated by multiplying the quantity by local market price Rs.200/N and Rs.100/N respectively. Gross economic value of plough was calculated by multiplying the quantity by local market price Rs.50/N. To get the gross total value for each caste and income group, all the items of gross economic value from different forest products are added in each case. The gross total value (benefit) obtained by households were quantified and averaged to represent the gross economic value or benefit per household for each caste and income group of households. Following formula were applied to calculate gross value (income) of different types of forest products:

IF = QF PF* ---------- *(1)*

Where IF= Income of Firewood

QF= Quantity of Firewood (one head load (Bhari) = 45 kg)

PF= Price of Firewood (NRs 35/ head load at local market)

*ITF = QTF*BGPTF*---------- *(2)*

Where ITF= Income of Tree Fodder

QF= Quantity of Tree Fodder (one head load (Bhari) = 45 kg)

BGPTF= Barter Game Price of Tree Fodder (NRs 18/ head load)

ICG = QCT BGPCT* ---------- *(3)*

Where ICG = Income of Cut Grass

QCT= Quantity of Cut Grass (one head load (Bhari) = 45 kg)

BGPCT= Barter Game Price of Cut Grass (NRs 20/ head load)

*IGL = QGL*BGPGL---------- (4)*

Where IGL = Income of Green Leaf litter

QGL= Quantity of Green Leaf litter (one head load (Bhari) = 45 kg)

BGPGL = Barter Game Price of Green Leaf litter (NRs 14/ head load)

*IDL = QDL*BGPDL---------- (5)*

Where IDL = Income of Dry Leaf litter

QDL= Quantity of Dry Leaf litter (one head load (Bhari) = 45 kg)

BGPDL = Barter Game Price of Dry Leaf litter (NRs 18/ head load)

*ITB = QTB*UPTB---------- (6)*

Where ITB = Income of Tree Branches

QTB = Quantity of Tree Branches (Number)

UPTB = User's Price of Tree Branches (NRs 18/Number)

*IST = QST*PST---------- (7)*

Where IST = Income of Sal Timber

QST = Quantity of Sal Timber (Q.B. feet)

PST = Price of Sal Timber (NRs 500/ Q.B. feet at local market)

*INST = QNST*PNST---------- (8)*

Where INST = Income of Non Sal Timber

QNST = Quantity of Non Sal Timber (Q.B. feet)

PNST = Price of Non Sal Timber (NRs 150/ Q.B. feet at local market)

*ILSP = QLSP*PLSP---------- (9)*

Where ILSP = Income of Long Sal Pole

QLSP = Quantity of Long Sal Pole (Number)

PLSP = Price of Long Sal Pole (NRs 500/ Number at local market)

*ISSP = QSSP*PSSP---------- (10)*

Where ISSP = Income of Small Sal Pole

QSSP = Quantity of Small Sal Pole (Number)

PSSP = Price of Small Sal Pole (NRs 300/ Number at local market)

*INSLP =QNSLP*PNSLP---------- (11)*

Where INSLP = Income of Non Sal Long Pole

QNSLP = Quantity of Non Sal Long Pole (Number)

PNSLP = Price of Non Sal Long Pole (NRs 200/ Number at local market)

*INSSP =QNSSP*PNSSP---------- (12)*

Where INSSP = Income of Non Sal Small Pole

QNSSP = Quantity of Non Sal Small Pole (Number)

PNSSP = Price of Non Sal Small Pole (NRs 100/ Number at local market)

*IP =QP*PP---------- (13)*

Where IP = Income of Plough

QP = Quantity of Plough (Number)

PP = Price of Plough (NRs 50/ Number at local market)

Thus, GITFP = IF + ITF + ICG + IGL + IDL + ITB + IST + INST + ILSP + ISSP + INSLP + INSSP + IP---------- (14)

Where GITFP = Gross Income of Total Forest Products

Net income from total forest products refers to revenues less cash and imputed costs of labour. Wollenberg & Nawir, 1999; Richards *et al*., 1999; & Adhikari, 2003 had used similar methodology for calculation of net forest incomes. The net income from forest products was, thus, calculated as gross income of total forest products minus implicated costs, including transaction costs incurred by forest resource using households. Following formula were applied to calculate net value (income) of forest products:

NIFP = GITFP – GC (LC + TC + MF) ---------- (15)

Where NIFP = Net Income of Forest Products

GITFP = Gross Income of Total Forest Products

GC = Gross Cost

LC = Labour Cost

TC = Transaction Costs

MF = Membership Fees

2.3.4.2 Calculation of Different Types of Costs

The costs here include labour costs of time directly associated with finding, extracting, processing and transporting the different types of forest products from the forest areas to

the house yard and the transaction costs (decision making cost, implementation cost and monitoring cost) incurred by users. Richards *et al*., 1999; & Adhikari, 2003 were used similar methodology for the calculation of labour cost and transaction costs to estimate the household level gross costs of community forest management in their studies. Cost information in this study was obtained during PRA group discussions with key informants. Since village wage rate varied with seasons, the average wage rate throughout the year was used. Differences in wage rates between villages were also considered since the wage rates were not identical for all CFUGs.

Under the aggregate cost structure, major three types of costs (labour cost, transaction costs and membership fees and under the transaction costs-decision making cost, implementation cost and monitoring cost were taken for the calculation to estimate the household level costs of community forest management in this study, which are as follow:

2.3.4.2.1 Labour Cost

Labour costs were calculated as costs of time directly associated with finding, extracting, processing and transporting the different types of forest products from the forest areas to the house multiplying by the per man day average wage rate at all the study sites. According to the local condition, average 7 hours were reported for one-day working hour and average wage rate for one-day were reported as NRs. 50. Following formula was employed to calculate labour cost of time directly associated with finding, extracting, processing and transporting the different types of forest products from the forest areas to the house.

*LC = TLH/ WH (7 hours)*ADW (NRs 50)* ---------- *(1)*

Where LC = Labour Costs of different forest products harvesting

TLH = Total labour Hours involved in different forest products harvesting

WH = Working Hours per day usually

ADW = Average Daily Wage rate

2.3.4.2.2 Total Transaction Costs

Three broad types of transaction costs were taken to calculate the total transaction costs, which are as follow:

Decision Making Cost

Cost of Decision Making (DMC) refers to the costs incurred during the process of acquiring information about forest and community, and the cost of coordinating the activities such as identification of potential users, preparation of forest management plan,

and negotiating with the forest department. These costs are mainly the time spent for general assembly meetings and executive committee meetings by all the user communities, conflict resolution and so on. Decision making cost were simply measured in terms of labour opportunity costs of decision-making activities such as time spent in identification of potential users, preparation of forest management plan, general assembly meetings, executive committee meetings and negotiating with the forest department etc. Following formula was used to calculate DMC:

*DMC = TLH/ WH (7 hours)*ADW (NRs 50)* ---------- *(1)*

Where DMC = Decision Making Costs involved in different decision-making activities

TLH = Total labour Hours involved in different decision-making activities

WH = Working Hours per day usually

ADW = Average Daily Wage rate

Implementation Cost

Implementation Cost (IC) refers to the costs incurred in carrying out obligatory forestry activities such as thinning, pruning, fire protection and cost of local trail construction and repair/maintenance from community to forest areas and so on in order to meet the terms with management decisions. Implementation costs were simply measured in terms of labour opportunity costs of time spent in different types of forestry implementing activities. Following formula was used to calculate IC:

*IC = TLH/ WH (7 hours)*ADW (NRs 50)* ---------- *(2)*

Where IC = Implementation Costs of obligatory forestry activities

TLH = Total labour Hours involved in different obligatory forestry activities

WH = Working Hours per day usually

ADW = Average Daily Wage rate

Monitoring Cost

Monitoring Cost (MC) refers to those costs incurred for monitoring and enforcement of agreed-upon rules, record keeping, maintenance of minute book, visiting of forests, financial monitoring of CFUGs and other monitoring related activities. Monitoring costs were simply measured in terms of labour opportunity costs of time spent in different types of forestry monitoring activities. Following formula was used to calculate MC:

*MC = TLH/ WH (7 hours)*ADW (NRs 50)* ---------- *(3)*

Where MC = Monitoring Costs involved in forestry monitoring activities

TLH = Total labour Hours involved in different forestry monitoring activities

WH = Working Hours per day usually

ADW = Average Daily Wage rate

Thus, Total Transaction Costs (TTC) can be derived from the following formula:

TTC = DMC + IC + MC---------- *(4)*

Where TTC = Total Transaction Costs

DMC = Decision Making Costs involved in different decision-making activities

IC = Implementation Costs of obligatory forestry activities

MC = Monitoring Costs involved in forestry monitoring activities

2.3.4.2.3 Membership Fees

A Membership Fee (MF) refers to the fee required to pay becoming an authorized user within the specified CFUG. It is a compulsory fee as decided by the general assembly of each CFUG to enter into the CFUG. Those users who do not have willingness to pay are outright excluded from the forest resource use.

The cost share of tools and equipments and its depreciation in forestry activities appears more insignificant due to the high percentage use of tools and equipments on non-forestry activities than forestry activities, so the cost of tools and equipments and its depreciation in forestry activities are dropped out from the cost analysis.

The operational process of statistical tools as discussed above primarily relies upon the calculation of computer for this research work.

2.3.4.3 Multiple Regression Analysis

A multiple regression model has been used to understand the relationship between forest dependency and socio-economic determinants. In other words, it has been used to understand the effects of different socio-economic factors on household level CF income. Several socio-economic factors are responsible for the variation in household level CF income among castes and income groups of households in rural Nepal. An attempt has been made to examine the effect of some important socio-economic variables on the extent of forest dependency among castes and income groups of households. A multiple regression model has been used with seventeen explanatory variables and household level income from CF as dependent variable. Yanggen and Reardon (2001) had developed an econometric model to understand the relationship between forest dependency (household level income from CF or value of outputs) and socio-economic determinants. Outputs refer to various forest products such as firewood, tree fodder, grass fodder, timber, leaf litter and other non-timber products that households collect from community forests. As discussed earlier in the chapter one, it was assumed that the

household level income from common property CF would be strongly linked with household and community characteristics. So, to examine the variations and the extent of forest dependency among castes and income groups of households, assuming the non-linear relationship between independent variables, the empirical model can be specified and symbolized as follow:

$Output_{i}$ = f (Household $size_i$, Land $holding_i$, Livestock $unit_i$ $Caste_{i,}$, Educational $status_{i,}$, $Age_{i,}$, $Gender_{i,}$, Forest product $price_i$, Distance to cpr_i, $Transactiondays_{i,}$ Membership number of FUG_i Membership status in $FUEC_{i,}$ Forest $quality_{i,}$, Forest $condition_{i,}$ income $status_i$ Distance to $market_i$, (exitoption).----------(1)

The corresponding regression equation (2) is defined as a log-linear model. The dependent variable, $Y_{i,}$ measures household-level return from CF (gross value of outputs). The independent variables, $X_{ij,}$ refer to the household and community attributes.

$$\ln Y_{i} = {}_{i1} + \Sigma 17 \; {}_{ij} \ln X_{ij} + e_i \text{----------(2)}$$

The quantity of different forest products harvested is an alternative method to measure forest dependency. However, it is not possible to aggregate different quantities of forest products into a single measure. Therefore, the gross value of output is preferred. In addition to equation 2, the link between socio-economic variables and forest products is explored by estimating the following regression. The equation 3 analyzes the relationship between the gross value of all types of forest products and socio-economic and community attributes. Table 1 describes the explanatory variables used in the empirical estimations.

$$\ln Y_1 = {}_1 \ln HSIZE + {}_2 \ln LANDHO + {}_3 \ln LIVESTO + {}_4 CASTEL + {}_5 CASTEH + {}_6 EDUSTATUS + {}_7 \ln AGE + {}_8 GENDER + {}_9 \ln TRANSDAY + {}_{10} \ln DISTANCE\ TO\ CPR + {}_{11} FUGM + {}_{12} FUECM + {}_{13} INCOMEPOOR + {}_{14} INCOMERICH + {}_{15} \ln MARKETDIT + {}_{16} GFOREST + {}_{17} BFOREST \text{----------(3)}$$

2.3.4.3.1 Explanatory Variables

While most of the variables in Table 2.1 are self-explanatory, some clarification is required on the dummy variable used. As discussed in PRA technique, the sample was divided into four castes and three-income groups based on the assets and wealth level of households. Thus, castes and income status are represented by the dummy variables i.e. *CASTEL, CASTEH, INCOMEPOOR* and *INCOMERICH.*

Ethnicity or occupational caste may affect the preferences of the household and thus influence labour allocation and consumption decisions. It may also be that occupational

households have different (less) access to local environmental resources than higher caste households (Cook, 2000). Power dynamics in communities are related to caste and this has implications for resource use. (Beteille, 1993) points out that in Indian villagers access to local common property resources is often restricted by the privileged (for example, *Brahmin and Rajput*) caste groups. The outcastes or scheduled castes are often among the poorest of the poor and are frequently deprived of entitlement to these resources due to social exclusion and marginalization. In such a setting, lower caste households of the community, i.e. *Dalit* may not have equal access to the local commons as the households belonging to upper casts i.e. *Brahmin/Chhetri*. Therefore, it is assumed that lower caste households derive lower income from CF compared to the higher caste households. It is argued that higher level of education in the rural community leads to extraction of fewer forest resources since education opens up better employment opportunities and diverts people from subsistence agriculture and gathering activities (Gunatilake, 1998). However, most forestry activities in the study site appeared to be phenomenon of illiterate and literate people since most of the children and young member in the family go to school and for higher education or outside jobs. In this respect, it is assumed that higher number of literate member in the family may be positively related to household-level benefits from community forests. Allocation of household labour among different activities may change over the life cycle of the head of the household (Godoy et al., 1998). To assess the extent to which forest labour allocation changes over time and its relationship with household level income from CF, the age of household head (AGE) was incorporated in the model. The age of household head is also related to the household's experience in managing common resources as well as accumulation of social capital. The higher levels of income from CPRs are expected to be associated with the older aged than the younger age of the household head because older aged people have better experience in local resources than younger ones and this may enhance the quantity of harvesting from CF. In common literature, gender is often used to test the effect of gender difference on the level of cooperation in CPR management (Grossman, 1994). Some experimental studies on gender and cooperative behaviour indicate that women contribute more increasingly than men to managing commons due to greater interdependent utility and altruism (Folbre, 1994). However, in this study, one of the aims was to see whether access to income from CPR is significantly different between male-headed and female-headed households. This is of particular importance in rural Nepal, where male members often enjoy greater freedom, income earning opportunities and control of resources. It is, therefore, hypothesized that male-headed households derive more income from community forestry than female-headed households do.

Table 2.1

Explanatory variables and hypotheses

Variables	Expected sign	Description
Caste (CASTEL)	-	Lower caste dummy (if so called *Dalit* caste =1, 0=otherwise
Caste (CASTEH)	+	Higher caste (If *Brahmin/Chhetri* =1, 0= therwise)
Age of household head (AGE)	?	Age of household head
Gender (GEND)	+	Sex of respondents (If male=1 0= Otherwise)
Education of household head (EDUHH)	+	Educational status of household head (If literate=1, 0=otherwise)
Landholding (LANDHOLDING)	+	Land area under household operation (in hectare)
Livestock (LIVESTOCKHOLDING)	+	Number of livestock owned by a household
Transaction Days (TRANSDAY)	+	Number of days spent in various obligatory forestry activities such as meeting, monitoring and implementation
Household size (HSIZE)	+	Number of people in household
Number of more FUG membership (FUGM)	+	Number of membership of FUG (If Household membership of more than two FUG =1, 0 = otherwise)
Key post or member post hold in forest user's executive committee (FUECM)	+	If key post (president, vice-president, secretary, and treasurer) or member post hold in forest user's executive committee = 1, 0 = deprived households to hold key post
Distance to community forest (CFDIST)	-	Distance between community forests and house (KM)
Forest condition (GFOREST)	+	Dummy for green vegetative covered forest (1=if more than 75% green covered by forest species in community forest.
Forest quality (BFOREST)	+	Dummy for broadleaved forest (1=if more than 75% crown cover dominated by broad-leaved species
Poor income group (INCOMPOOR)	-	If households belong to the poor income group=1
Rich income group (INCOMRICH)	+	If households belong to rich or "less poor" income group=1
Market distance from house	+	Market distance from house (KM)

Household members with bigger land ownership and livestock holding (or non poor households) are expected to benefit proportionally more from CF because the management regime of CF is mainly oriented to the production of intermediate products that serve as inputs in the farming system (Richards *et al.*, 1999). The difference in the extent of use of local forests may be associated with the number of livestock units raised by the households. Wealthier households with larger herds and more lands have greater

need for animal fodder and agriculture compost (Varughese, 1999), which, in turn, results in inequitable use of the community resource base. In many rural settings, households invest surplus income to increase the size and scale of production systems. Rural households may invest a substantial amount of their income for either buying agricultural land or improved breeds of cattle. Since community forests provide inputs for expanding agriculture activities, dependency on forest does not necessarily reduce as household income increases. Under such circumstances, forest extractive activities continue to remain as important for the household economy as off-farm income opportunity and agriculture itself (Hetch *et al.,* 1988). In this study, the extent of land and the number of units of livestock were assumed to be positively related to the benefits from CFs.

Harvesting forest product is labour-intensive because people have to walk, search and spend time harvesting such products. Household size has a direct influence on the capacity of a household to harvest forest products when there is a very low level FUG restriction on collecting products. A larger household therefore has more labour to spread across various collecting and gathering activities and such households may derive more resources from the commons. More labour in the family means the household's time constraints are set at a higher level as per the time allocation framework and that may lead to extra extraction (Gunatilake, 1998). Therefore, the effect of household size on CPR income is expected to be positive.

In many forest resource systems, users who live closer to the forest have a more secure and accessible supply of produce regardless of whether or not there is allocation rules in place (Varughese, 1999). As (Gunatilake, 1998) describes that families living close to the forest have the advantage of less time being required to reach a particular forest resource and their links with forests are, therefore, expected to be high. Those who live closer might be tempted to sneak into the forest at unauthorized times or harvest unauthorized amounts of forest products even though management institutions are in place (Varughese, 1999). Therefore, it is hypothesized that distance to the forest is negatively associated with forest dependency.

Household position in decision-making level or time spent in leadership activities of community forestry could also affect the extent of forest use and thus economic benefit from the commons. Awareness of the potential gains achievable from community forests may be enhanced by regular meetings and discussions through which relevant information is conveyed or even generated (Gaspert *et* a!., 1999). This information may not circulate well in a village to economically and politically weaker members due to the presence of either physical or psychological bafflers. Users with membership in forest

executive committees are better informed about the potential benefits of collective action. As a result, they may have opportunities to derive comparatively higher benefits from commons. Therefore, economic benefit from CPR is assumed to be positively associated with an individual's leadership status in decision-making levels and representation as an authority or member in forest executive committees. In this study, representation in forest executive committees and transaction cost days spent in community forestry activities are used as a proxy for leadership status. Household's membership of more than two CFUGs could also affect the extent of forest use and thus economic benefit from the commons. The higher levels of income from CPRs are expected to be associated with household's membership of more than two CFUGs than the membership of only one CFUG because household's membership of more than two CFUGs has alternative access to local resources than the membership of only one CFUG and this may increase the quantity of harvesting from CF.

In order to capture whether forest conditions and types influence household level income from community forest, two additional dummy variables, i.e., vegetative covered forests and broad-leaved forests, were included in the model. Regarding the forest conditions, two types of forest were observed in the study area i.e. more than 75.0 percent green covered by forest species and less than 75.0 percent green covered by forest species in community forest. The former is considered as good forest condition and the later type of forest is considered a bad forest condition. Therefore, the higher levels of income from CPRs are expected to be associated with good forests of more than 75.0 percent vegetative covered by green species than the less than 75.0 percent green covered forests. Similarly, regarding the forest quality, local people generally perceive coniferous forests to be less useful since they do not provide much fodder. There is low ground flora diversity in pine forest and they are not suitable for ground grass collection. Moreover, pine needles are an inferior source of manure. In contrast, broad-leaved forest is much preferred since it provides both fire wood, fodder and leaf litter. In case of forest type variable, mixed forests with broad leaved and coniferous species (dominated species were *Pinus roxburghii, Schima wallichii, Castanopsis indica* and other broad-leaved species) was considered a reference forest type. Therefore it is hypothesized that household income from CF is expected to be positively related to broad-leaved forests.

Access to markets may reduce the dependency of households on the local commons since community members may have some exit options in terms of outside earning opportunities. In contrast, villages far from the market are more likely to be dependent on CPRs due to lack of alternate livelihood opportunity. For the village nearer to market, the sign of coefficients for forest income is expected to be negative while it is positive for the villages far from the market.

CHAPTER 3

3 REVIEW OF LITERATURE

As earlier mentioned, this study aims to verify the victim hypothesis providing empirical evidences of differential distributional impacts and externalities effects of community forest management on the poor and non-poor households at the local level. Bulk of Studies has concentrated on loss of forests focusing on environmental value rather than loss of equity of forest resources to forest dependent population. In recent times, the equity issues and environmental justice of local commons (water, forest and public land) often called these common property resources have come into focus for a number of factors; The continuous deterioration of the local rural institutional framework, increasing rural poverty and inequalities, population pressures, political and bureaucratic corruption, socioeconomic heterogeneity nature of resource users, dissolving social norms and organization, resettlement programmes in forest areas, constructional works, creation of poverty non- responsive semi-urban market center due to rural road access and disjointed poverty-environmental policy reinforces each other and thereby increase in the vulnerability in use and management of common property resources have made not only livelihood difficult but also poverty reduction for the rural poor, specially marginalized, disadvantaged groups and the weaker sections of the society. Moreover, the declining size of common property resources has affected environmental justice and their efficiency to perform certain ecological functions.

A brief review of literature relating to the issues of this research study at the international and national context has been given below:

3.1 Review of Literature: International Context

From classical economists led by Adam Smith to Marxist economists led by Marx including to present-day environmentalists, all have emphasized more or less the role of markets and institutions in transforming economic relations of production and resource use and management patterns. Adam Smith and Karl Marx were confident that capitalist economic expansion, through markets and trade would inevitably transform pre-capitalist productive relations (Brenner, 1977).

(Binswanger, 1980) in a study of 240 households in the semi-arid, tropical rural areas of India, uses an experimental, sequential gambling approach with real pay-offs to identify attitudes toward risk. The households in the sample are predominantly poor, but with considerable variation. He finds that relatively poorer people tend to be slightly more risk-averse. Although the estimated coefficients are largely consistent for the poverty

variables (salary, assets and net transfers) across all sub-sets (villages) of respondents, the results are in several instances not statistically significant. The study does not extend to capture environmental impacts of differing risk aversion at different poverty levels. Without explicitly translating his findings into implications on discount rate, he summarizes in a discussion paper based on broader empirical evidence: “Farmers in developing countries are almost universally risk averse when confronted with prospects with significant outcomes.” and …“every local measure of risk aversion on a utility function would differ according to wealth unless very restrictive utility functions are chosen.” (Binswanger, 1982, p. 392).

(Jodha, 1986) conducted a research on Common property resources and rural poor in dry regions of India. In his now classic study, Jodha quantifies the extent to which the rural poor benefit from common property resources (CPRs). His argument is that the decline of CPRs, in part a consequence of privatization of CPRs, results in the subsequent pauperization of the poor. The study, based on data from 80 villages in 21 districts in dry regions of seven states in India, reveals several important findings. It shows that poor households (“poor” refers to landless laborers and small farmers with less than 2 ha of dry land.) are much more dependent on CPRs than larger farm households. For instance, while 95 percent of the poor households in Andhra Pradesh were dependent on CPRs for food items, only 10 percent of the larger farm households were dependent on CPRs for food. Further, Jodha’s study shows that income from CPRs account for a larger percentage of income from all other sources for poor households compared to better off households. Thus, CPRs accounted for 15-23 percent of total income from all other sources for the poor households. The corresponding figure for larger farm households was only 1-3 percent. The study also reveals considerable inter-regional variation in household’s dependence on CPRs. For instance, while in Mahabubnagar, Andhra Pradesh 84 percent of poor households was dependent upon CPRs for fuelwood, the figure for Sabarkantha, Gujarat is 66 percent. The evidence presented in this study was based on field studies of CPRs conducted during 1982-1985. The method included regular monitoring structured surveys, physical verification/measurement, oral history, and participant observations from people in each district. The above information was supplemented by longitudinal data available from ICRISAT’s village level studies.

Jodha shows that Common Property Resources (CPRs) provide a significant contribution towards employment and income generation for the rural poor in India. Based on data from 80 villages in 21 districts in dry regions of seven states in India, he shows that the dependence of richer households on CPRs is much less. Further, the area of CPRs has decreased dramatically during the last three decades, ranging between 26–63 percent in the studied districts. Privatization of CPRs was introduced to support the poor, but the

result was the reverse: 49–86 percent of the privatized CPR areas ended up in hands of non-poor, and CPRs held by poor were eventually sold to richer people to facilitate short-term survival. Jodha concludes: “Thus the rural poor collectively lost a significant part of the source of their sustenance through the decline of CPRs. This loss does not seem to be compensated by privatized CPR lands given to (or retained by) them. The situation calls for greater attention to CPRs as a part of the antipoverty strategy” (Ibid, p. 1169).

(Boserup, 1986) however, has become the principal representative of the contesting view. She argues that resource scarcity and population growth jointly induce technological change, innovation and intensification, which does not necessarily affect negatively on the environment. Hence, poverty and population growth become positive agents of change in a dynamic interplay, which often results in introduction of more efficient production techniques. In fact, empirical studies of the population poverty-environment links indicate validity of each of the contesting views. Hence, it might very well be, as argued by (Heath & Binswanger, 1996) that the final outcome can go either way and is essentially driven by policy; i.e. whether growing population pressures induce positive or negative environmental change is ultimately and fundamentally driven by the overall policy framework.

(Saxena, 1988) shows in a detailed study of forests with different property rights in Uttar Pradesh, India, how tree cover had degraded to 10 percent on forest lands owned by the Revenue Department, 50 percent in forests owned by the Forest Department, and 70 percent in forests owned and managed by local communities and village forest councils. The study concludes that the level of effective enforcement of property rights was crucial in explaining the level of degradation. (Hoy & Jimenez, 1996) analyze the impact of incomplete property rights on urban environments in Indonesia. Given variable property rights, they estimate in Probit Model determinants to the probability that households invest in local public goods, specifically the households’ propensity to purchase garbage collection services. Among other results they “…find strong support for the hypothesis that reduced tenure security significantly reduces the level of local public goods”, and that “…going from squatter to moderate [tenure] security increases the probability of garbage collection by 32 percent, while going from squatter to high security raises the probability by 44 percent” (Hoy & Jimenez, 1996 p. 16). They also report an independent, statistically significant positive relationship between household income and the probability that households purchase garbage collection services.

(Mahar, 1988; & Binswanger, 1989) analyze the impact of Brazil’s government’s policies on the forest resources of the Amazon region and conclude that they have

contributed to large scale deforestation. An area of more than 600,000 km2 has been cleared, 80 percent of which has occurred since 1980. The government's role in this massive loss of natural capital has been one of biasing the allocation of land and agricultural credits towards the rich, promoting environmentally hazardous road developments, concessioning settlements in ecologically sensitive areas, and encouraging livestock development through grazing-area expansion.

(Southgate, Sierra & Brown, 1989) empirically estimate the causes of tropical deforestation in Ecuador. Based on data from eastern Ecuador's twenty cantons and statistical Ordinary Least Squares (OLS)-regressions to explain deforestation, they conclude that it is negatively correlated with land tenure security. There are several driving forces behind the population-poverty-environment nexus. Although many poor people are old people or single mothers, many poor households are poor because they are large and large because they are poor. Poor parents tend to produce many children to secure income at old age, and provide labor to collect essential goods such as water, firewood and fodder. Children also play an important role in attending grazing animals, do other household chores and earn incomes by e.g. selling crops or other household produce. Further, poorer households are large due to lack of knowledge or means to sufficiently protect themselves against unwanted pregnancies. Family size is also determined by social norms and cultural traditions. In some societies, adults are also expected to have many children as a sign of wealth or fertility, or both.

(Chandra, & Poffenberger, 1989) have prepared a study report on community forest management is west Bengal: Forest Protection Committee (FPC) case studies including nearly 1300 forest protection committees currently active in southwest Bengal. The report supports the theory that local communities can be effective caretakers of the forest, contrary to the report of the Indian commission on forestry, 1976, which stigmatized the forest dwellers for causing degradation. The west Bengal experience with FPCs indicates that forest communities may represent a key to resolving forest management problems. The study indicates that social composition; population density and forest conditions influenced participation patterns and benefit flows. Areas with degraded, but viable forest cover regenerated quickly under effective protection and yielded increases in household income from Rs. 2/- to Rs. 9/- per day, within two to three years after production was initiated.

The study found that protection systems requiring volunteers rather than paid guards to enhance local communities to protect forest resources. Small amount of fines sufficient to offenders into changing their behavior than heavy penalties. Rules and regulation should not be standardized, leaving flexibility to allow members to design them to meet

the needs of the local population. To maintain effective operations, committees should remain relatively small. The forest department should continue to provide income-generating activities to dependent families in forest communities during the early phase of forest regeneration. Proper training should be provided to forest staff at all levels regarding processes to establish and support FPC.

(Lappe & Shurman, 1989; & Simon, 1990) thought that the role of population and merketization is limited. These theorists ignore the fact that institutions of use that are not the direct or linear result of particular equilibrium levels of demand and supply always mediate the impact of rural road access and markets. Under the influence of norms and institutions of use, rural users may receive or forego cash incomes from sale of forest products. Rising demographic pressures, state and market interventions lead to accelerated degradation of CPRs, but their effects are mediated through local level institutions managed by resource users (Wade, 1986; Ostrom, 1990a, 1992b; Runge, 1992; Uphoff, 1992).

(North, 1990) believed that history matters and despite interventions institutions keep evolving and their continuity helps linking the present and future with the past. For example emphasize on rule systems and enforcement and sanction mechanisms in the conceptualization of institutions. These institutional forces affect organizations and provide assurance mechanisms, which in turn influences the resource use and management. The manner in which communities unite to act collectively, device their own rules, define access, appropriation of resources, boundaries and negotiate with external interventions, take up enforcement measures, manage caste and economic differences and address equity issues and gender issues, are critical to resource use studies.

(Ostrom, 1990) shows how poor people indeed can utilize fragile ecosystems and common-pool resources sustainably over long time periods, even centuries in some cases, if some specific conditions or, in her terminology, “design principles” are fulfilled. Her global review draws on evidence from cases such as communally managed high mountain meadows and forests in Switzerland and Japan, basin water resources in southwestern USA, and irrigation-water schemes in Spain and the Philippines. Based on the empirical survey, the conditions she identifies as essential for long-term, sustainable management of common pool resources (CPRs) is: First, the geographical boundaries of the CPR must be clearly defined. Second, appropriation of CPRs, provision rules for CPRs and the local socio-economic and environmental conditions must be congruent and coherent. Third, consensus-like collective-choice arrangements for managing the CPRs must exist; in other words, most individuals who are affected by the operational rules can

participate in modifying them. Fourth, adequate monitoring of the use of the resource must be developed and function over time, i.e. monitors who actively audit CPRs and the appropriators are accountable to the appropriators or are the appropriators. Fifth, graduated sanctions must be imposed on those violating the rules. Other appropriators, by officials accountable to the appropriators, or both, preferably assess the sanctions. Sixth, cost-efficient conflict-resolution mechanisms (e.g. low-cost local courts) must be developed and utilized. Seventh, stakeholders' rights to organize themselves in CPR-management schemes must obtain (at least minimal) recognition by the Government. Eighth, based on the subsidiary principle, the above design principles should be coherently tied together locally, regionally and nationally, and implemented (in "nested enterprises") at the lowest appropriate level of decision making.

(Tiffen, 1993) has made a case study research on Productivity and Environmental Conservation under Rapid Population Growth in Kenya. In this case study contrary to a prevailing view regarding the relationship between population and environmental degradation is that any agro-ecological region has a population supporting capacity and environmental degradation results if the population exceeds that threshold, Tiffen argues in this article that under certain conditions, increasing population density can be an important motivating factor for economic growth, without necessarily resulting in long-term environmental degradation. She demonstrates this through a case study in Machakos district, Kenya, covering a span of 60 years from 1930-1990.

According to Tiffen, in the 1930s and 1940s, the cultivated and grazing lands in many parts of Machakos district were severely eroded. The population density was 60 persons/sq kms, which according to some had exceeded the carrying capacity of the land. By 1990 however, there was much less soil erosion, almost none of cultivated land and more animal and crop production on a district basis. Although there was a real dip in output per hectare in 1957, as people spread on to more land, from 1960-1977, output per head rose more steeply than population density. Moreover, income per head increased due to growth in non-farm incomes. At the household level, farmers invested in terms of capital and labor in making terraces, hedging and fencing, building dams, buying equipment, planting tree seedlings, investing in improved livestock, etc. and put increased working capital to finance the two seasons and secure timely operations. At the community level, there were investments in gully stopping, dip construction, coffee processing plants, and construction of roads and dams. This was a good example of community based management of land in Kenya.

According to Tiffen the explanation for increasing productivity in terms of output per capita and per hectare as population grew does not lie in better rainfall that has been

quite erratic. Government interventions, such as the construction of compulsory terraces many of which collapsed, also do not explain the puzzle. Rather, following Simon, 1986, she argues that increasing population density had several positive effects. It resulted in agricultural intensification requiring increased inputs of labour, which in turn provided the impetus for technological innovation. Moreover, she argues that in a semi-arid unpredictable climate where it was difficult to raise money from agriculture, off-farm income provided an important source of capital. This was facilitated by community investment in infrastructure and in complementary services such as investment in shops, stores, and lorries from traders to deliver inputs and consumption goods to collect farm products. For example, roads played a crucial role in linking the district with urban markets such as Nairobi, thus facilitating access to new knowledge and demand. For instance, supporting agricultural technologies came from many different sources, both within and outside the district. One of the policy implications of Tiffen's study is that government investments in physical and educational infrastructure are more important than direct government investment in agriculture. It also suggests that higher farm gate prices are perhaps the single most important factor to encourage soil and water conservation. The study does not argue that growth rates in excess of 3 percent are necessarily ideal, especially once densities have increased to a point that provide real economies of scale in infrastructure provision. However, the study does provide an important counterpoint to the assumption that high population densities automatically result in environmental degradation.

(Mink, 1993) for instance, argues how the Poor's living environment-characterized by low quality and access to water-poor sanitation and polluted in-door air, and production practices impact negatively on themselves and others. It is among others manifested in lowered household productivity, which further exacerbates the environmental degradation and provides incentives for households to raise large families. This would further contribute to pauperism in an adverse, dynamic pattern. Mink makes the case that alleviating poverty is a win- win strategy with respect to population growth, the economy and the environment. Lacking the means to move to a better environment, large households suffer from their own (and others') resource degradation. The mutual interdependence between these factors sets off a negative spiral: the poorer a household is, the more children are needed to secure current and future livelihood. The larger the family is, the more resources it needs. The higher the resource demand, the larger the pressure on the scarce or fragile surrounding natural-resource base. The more degraded or depleted the environment, the more children it has to have to secure old age and provide essential goods and services. The more time spent on collection, less time is

available for education and human-resource development. Less time for education will perpetuate poverty into next generation.

(Pearce & Warford, 1993) argue that there is strong evidence of negative environmental impacts of increasing populations. They exemplify by referring to the strong negative relationship identified between forest coverage and population density in 72 tropical countries. They confirm this by estimating statistically the impact of increasing population pressure (defined as the rural population density), population growth rate and increased per-capita income on deforestation, respectively. They use data from 64 developing countries between 1961–1988. Their results indicate that population pressure as well as population growth is generally positively correlated with deforestation. In Africa, for instance, the deforestation rate would increase 0.33 percent as population-density increases with one person per 10 hectares. These effects are to some extent offset by increasing GDP and GDP/capita.

(Dasgupta & Mäler, 1994) argue along the line that a skewed distribution of wealth and income has implications for environmental pressure. For example, if small-scale farmers are compelled to utilize marginal areas because large-scale landowners occupy the best agricultural land, the inequitable land distribution may be an important driving force behind deforestation and land degradation. They argue that poverty and many environmental problems stem from, or are exacerbated by, inequality. They also emphasize that in the presence of inequality, many local common property management schemes break down. This, in turn, results in negative impacts on the most vulnerable. A corollary to the hypothesis above is that average GDP growth does not by definition imply simultaneous poverty alleviation and environmental improvements. The effect can in fact be the opposite or mixed, if growth plays into the hands of privileged elite. For a full account, the effects of economic growth on poverty and environment need to be evaluated at household level. The effect on individual household members of a deteriorating environment can vary widely. In particular, children are the most vulnerable to poverty and environmental degradation: for instance, children inhale greater quantities of air-borne pollutants relative to their body weight because of their higher activity levels; they contract diarrhea more frequently due to higher exposure to vectors; infants in particular are exposed to higher health risks as they have not fully developed their immune system. There is also a gender aspect to the poverty-environment linkage (Agarwal, 1997). Thus, it is imperative to develop the understanding of poverty-environment interactions among sub-sets of poor people.

(Bluffstone, 1995) made a research work on the effect of labor market performance on deforestation in developing countries under open access: An example from rural Nepal.

This research examines the deforestation behavior of smallholder agriculturalists as off-farm labor market condition change. A model of a representative village is proposed, which incorporates dependence on open access forests for fuelwood and animal rising. Dynamic simulations are then presented, which compare time paths of forest stocks, deforestation levels, and household labor supply under a variety of conditions. Despite the open access regime assumed in the model, with a perfect, albeit low-wage, off-farm labor market, the agro-forestry system in Nepal is stable. An alternative model where there is no off-farm labor market eliminates the important features of adjustment to deforestation that generate forest stability, suggesting that the availability of off-farm opportunities is an important determinant of deforesting behavior and equilibrium forest stock levels.

(Rahman & Hossain, (Eds.), 1995) have published a research article on Rethinking rural poverty: Ecological reserves and expenditure saving scope for the poor, Bangladesh as a case study. In this article, the author distinguishes between two types of productive activities that together comprise rural household welfare, namely income earning (such as working for a wage in agriculture) activities and expenditure saving (such as fuelwood collection, collection of house building materials from village commons) activities. Overall, household welfare is an outcome of both types of activities. The focus is to measure the extent to which expenditure saving activities contributes to the welfare of poor households. The authors estimate annual savings on expenditure on three items, fuel, house-building materials and fruits/vegetables from survey data gathered from 62 sample villages in Bangladesh between 1985-1990, covering all geographic areas of the country. Their study shows that expenditure saving activities contributes approximately 20% to the annual household welfare of the landless and approximately 4% to the total household welfare in the case of large landowners. What is striking is that these estimates do not include the value of fish obtained from common access waters, which is very significant in Bangladesh. Thus, Rahman's study emphasizes the importance of ecological reserves in the routine functioning of rural household economies.

(Myers & Kent, 1995) in their comprehensive study on Environmental exodus-an emergent crisis in the Global Arena, indicates that there are approximately 25 million environmental refugees in the world. For comparison, the numbers of traditional (political and war) refugees are estimated at 22 million. The report defines "environmental refugees" as "… persons who can no longer gain a secure livelihood in their traditional homelands because of environmental factors of unusual scope, notably drought, desertification, deforestation, soil erosion, water shortages and climate change, also natural disasters such as cyclones, storms and floods" (Myers & Kent, 1995, p. 19). Many of these refugees are located on the Horn of Africa and in the Sahelian region, but

a large portion also resides in the Indian sub-continent, China, Mexico and Central America. Based on six regional case studies, the report states that "poverty, and especially absolute poverty, works in conjunction with environmental actors and population pressures to produce sizable numbers of refugees who are driven by all three factors working in conjunction" (Ibid, p. 19).

In a summary view, (Prakash, 1997) who exemplifies Boserup's school of thought, states that based on empirical studies in Kenya (Bradley, 1991; Ferguson-Bison, 1992) and the Himalayas (Ives & Messerli, 1989) "…there is no fundamental relationship between population density and environmental degradation. The assumption that high population density will necessarily cause greater anthropogenic degradation is exceptionally difficult to justify given the available evidence" (Prakash, 1997 p. 12). Based on the above arguments and empirical evidence, it seems clear that it is not possible, a priori, to say that population growth or high density will result in environmental degradation.

Clearly, population growth plays a crucial role in determining the quality and stock of natural capital, but in many instances, it is not the root cause of environmental degradation. Rather than embarking on massive population-control programs, underlying policy and market failures should be scrutinized and corrected first and foremost. Good economic policies, secure tenure rights, political stability and a dynamic economy can all contribute to alleviate the pressures from population. Again, this reinforces the complementarities between different types of operations. Much of this complementarity appears obvious: market-oriented reforms that stimulate urban job growth can attract surplus labor out of a sensitive forest zone, and so forth. However, one type of complementarity that has been given little notice is one between Community-Based Population control and Environmental management (CBPE) activities. The interesting research by Population Plan International (Engelman, 1998) provides a synthesis of the experience so far. From a population perspective, the experience of several NGOs suggest that this approach to linking conservation and reproductive health activities, at the request of community members, can reduce costs for family planning service delivery in remote areas by taking advantage of personnel and networks already developed for conservation work. From the environmental perspective, women who manage the timing of childbearing may be better able to manage competing tasks, including the local natural resources, Engelman argues.

(Filmer & Pritchett, 1997) assess the existence of a vicious circle between environmental degradation and fertility. Based on data from Pakistan, they conclude that (i) firewood availability seems to be negatively correlated with fertility, and (ii) households living far from firewood have more children. Filmer and Pritchett also present a model of

population-forest cover interaction. It identifies distinct stages (or phases) across time, in which population and forest cover alternately correlate positively or negatively depending on the population growth. They cautiously conclude: "A claim that these results confirm the existence of a vicious circle between environmental degradation and demand for children is clearly far too strong. The results, however, are supportive of the notion that there is a stage in time in the relationship between environmental degradation, fertility, and land ownership rights during which children are in relatively high demand" (p. 31).

(Holden, 1997) analyzes the impact of Zambia's SAPs on the Chitemene slash-and-burn shifting cultivation system, which requires large amounts of woody biomass for crop production. The adjustment policies included (i) introduction of a market-based exchange rate; (ii) removal of price controls, leading to regional and local price differentiation, (iii) removal of food and fertilizer subsidies, leading to higher consumer food prices and higher fertilizer prices for farmers, (iv) reduced government involvement in production and marketing, and (v) reduced government expenditure. Based on Ordinary Least Squares (OLS) and Tobit-regressions of cross-section data from 1992/93, Holden concludes that removal of fertilizer and transport subsidies resulted in substitution from maize to local crops (such as finger millet, groundnut, beans and cassava), expansion of shifting cultivation and thus increased deforestation. Deforestation has had limited negative environmental impact, however, mainly because the miombo woodlands in northern Zambia are still abundant, the biodiversity value is relatively low, local externalities such as soil erosion and water contamination are not yet disturbing, and other use and non-use values of the forest resources are limited. Hence, the opportunity cost of burning the forest is still small, but Holden cautions that if population growth continues and current policies are pursued, deforestation may become a serious environmental and economic problem.

Based on an empirical assessment of farmers' discount rates in Costa Rica and a review of 14 other empirical studies, (Cuesta et al., 1997) conclude that "[T]here is some evidence of declining discount rates with increasing income, time frame, and size of investment" (p. 3). They show that several analytical methods can been used to measure individuals' real rate of time preference: e.g. experimental games-approaches using binary choice, actual asset-choice models based on loans and land transactions, utility maximization models reflecting valuation of inter-temporal cost-benefit streams, and Contingent Valuation (CV) using Willingness To Pay (WTP). In their study, they apply CV and asset-choice models to reveal the real discount rate among 292 Costa Rican small- and large-scale farmers. When faced with questions on past and expected price changes, and their WTP for certain farm technology, 95 percent of the farmers show real

discount rates in an interval from 15.1 percent to 21.9 percent. The results show a negative relationship between income and real discount rate.

(Vincent & Ali, 1998) conducted a research study on Deforestation in peninsular Malaysia. They observed between 1966 and 1981, peninsular Malaysia lost about 236,000 hectares of forest each year and its total forest area fell from 9.65 to 6.82 million hectares. Rubber and oil palm plantations replaced much of the forest lost. However, by the late 1980s the rate of conversion slowed, as industrialization and urbanization caused the rural labour market to tighten and agricultural returns to fall. The area in agriculture grew 520,000 hectares in the seven years between 1974 and 1981, but only 160,000 hectares in the nine years that followed. Based on a regression analysis of the region's 65 districts, they found that deforestation rates increased as per capita incomes rose until districts reached an average income of 1,100 Malaysian ringgit, after which they fell sharply. By 1987, practically all of peninsular Malaysia's districts had income levels higher than that. Not only did deforestation rates fall, but farmers also left significant areas 'idle' and allowed them to begin to revert to secondary forest. As rural youth moved to the cities to obtain manufacturing and public sector jobs and the farm population aged, farmers apparently decided to take more marginal farm lands out of production.

(Tomich, Noordwijk, Vosti & Witcover, 1998) made a research study on Agricultural development with rainforest conservation: Methods for seeking best bet alternatives to slash-and- burn, with application to Brazil and Indonesia. The key findings of the study was that forests continue to fall for agricultural purposes throughout the humid tropics, with immediate and potentially large consequences for climate change and biodiversity loss issues of key interest to the international community. Some of the actors directly responsible for forest conversion fell trees to meet food security needs and alleviate poverty issues of urgent interest to them and also to national policymakers. This multiplicity of groups with differing (often conflicting) interests in the multifarious goods and services produced by tropical forests complicates the search for alternative agricultural activities for forest margins since these alternatives must satisfy such divergent objectives. This paper sets out a conceptual framework for comparing the impacts of different land use systems and agricultural practices at the margins of tropical rainforests in terms of the concerns and objectives of two key interest groups: small-scale farmers seeking livelihoods at the forest margins and the `international' interests in the global public goods and services supplied by tropical rainforests.

This framework should be useful to a third key group, the national and regional policymakers who must consider these and other policy objectives and then decide on

courses of action. The paper identifies data needs and analytical methods capable of supplying an empirical base for this conceptual framework, based on quantifiable indicators. It then presents preliminary results of the application of this conceptual framework in Indonesia and Brazil in association with a global, collaborative, multidisciplinary research program. Even using preliminary order-of-magnitude estimates (to be replaced by more precise measurements as they become available), this conceptual framework presents results in ways that allow researchers and policymakers to select clear `best bets' for development, when they exist, and to assess tradeoffs and options for complementary policy action and research efforts, when they do not.

(Cavendish, 1998a, 2000b) has prepared a study report on Rural poor's dependence on natural resource in rural Zimbabwe including different dimensions of the linkages between rural poverty and natural resources namely; the complexity of the commons: environment resource demands in rural Zimbabwe. The other two papers are: Poverty, inequality and environmental resources: Quantitative analysis of rural households and empirical regularities in the poverty-environment relationship of African rural households. Author of the first paper looks at one aspect of the poverty-environment relationship, namely that between rural households and natural resource utilization and change. Its main argument is that freely available natural resources or the "commons" provide rural households with a range of goods and not simply a single homogenous good as is often assumed. Further, these goods are significantly differentiated in economic terms being utilized by rural households as consumption goods, consumer durables, and production inputs, inputs into productive capital and as assets. Various factors affect their utilization such as the household's spatial location, the opportunity cost of labor, relative price of environmental goods, household income, harvesting and processing technologies, resource scarcity. Thus each of these resources can be affected quite differently by changes in exogenous parameters. Cavendish argues that this constitutes the complexity of the commons, a feature not represented in standard models of characterizing the poverty-environment relationship.

The bulk of the paper provides econometric substantiation for the claim of resource differentiation and utilization. This is based on data set drawn from 29 villages in Shindi Ward, Chivi District in southeastern Zimbabwe. Results from environmental demand regressions support the assumption of economic differentiation of natural resources and their multiple uses by rural households. Estimated income elasticties differ across goods and species, and there is evidence that other determinant of demand such as species substitutes and backstops, scarcity and household structure also affect different goods in different ways. By providing evidence for natural resource differentiation this paper fills an important gap in the literature where quantitative studies that integrate the value and

use of a broad range of environmental resources alongside more standard set of household economic activities is scarce.

The second paper also highlights the facts that, although rural households are taken to rely substantially on freely available environmental resources, few studies have attempted to quantify the contribution of environmental resources to household welfare. Most standard household budget surveys omit this source of household income. In this paper, Cavendish examines the impact of including this missing source of household income on the measurement and causes of rural poverty and inequality. This is done using a purpose collected 213 household data set from rural Zimbabwe. The study shows that incorporating environmental income in household accounts results in dramatic and significant reductions in measured poverty, 50 percent or more over income as conventionally measured. Environmental income is also strongly equalizing, bringing about a roughly 30 percent reduction in measured inequality. Thus, access to commons has a substantial impact on rural poverty and inequality, and omitting these activities from the income measure systematically overstates inequality and poverty measures. However, contrary to what one might expect, the inclusion of environmental income surprisingly had very little effect on the analysis of the causes of inequality and poverty. Differences in access to formal labor markets and inequalities in land distribution emerged as the main determinants of rural inequality in the study area. Variations in the cash income from formal wage employment and agriculture are the two most important sources of rural inequality. One explanation for this puzzle could be in the presence of entry barriers in these other economic activities, which are likely to generate a surplus. Cavendish argues that since environmental income sources are entry free, they are disproportionately undertaken by rural households and are also low return. Hence, they play little role in helping households overcome accumulation constraints that impede the household from raising its income significantly.

In his third paper what the author has found out that conventional household surveys usually ignore the contribution of environmental resources to household income. Hence analysis of rural households and environmental resources is beset by inadequate data and little is known about the value of environmental resources in terms of overall household welfare. Using purpose collected data in 1993/94 and 1996/97 from Shindi Ward in southern Zimbabwe, involving a random sample of 197 panel households in 29 villages, Cavendish provides quantitative evidence for a number of regularities that characterize environmental resource use by rural households. In particular, his study shows that environmental resources contribute significantly to rural households incomes, comprising roughly 35 percent of average total income. Further, the contribution of some of the environmental sources from which the poor derive their income is equal to or

greater than other income sources such as cash crop production, unskilled labor income, income from small-scale enterprises that have received much more attention in the literature. An important finding of Cavendish's study is that poorer households are much more dependent on environmental resources than richer households.

A detailed survey in Zimbabwe of 213 rural households' use of several hundred non-marketed ("wild" or "environmental") goods collected at local commons shows that these goods account for a substantial share of poor people's household budgets, and a significantly larger share than in richer households. Value derived from environmental goods constitutes as much as 40 percent of the total household budget in the lowest income quintile, but only 25 percent among the top quintile. Ordinary Least Squares (OLS)-and Tobit-regressions show that all but one of the income elasticity for "wild" goods is positive but mostly low. This indicates that as incomes rise, the relative budget share of wild goods decreases but contrary to the hypothesis: *Poor people are more vulnerable to loss of biological resources*-that total demand for wild goods increase, albeit at a slow pace. The study also identifies that the elasticity vary widely between individual species: increasing incomes result in substantially larger consumption of e.g. fish, game meat, and local pottery, moderate increase of e.g. mice, and wild fruit, and decreased consumption of some e.g. household utensils. Hence, some wild goods are complements and some substitutes to purchased goods. Cavendish concludes that his evidence does not support the common notion of a single poverty-environment relationship.

However, even though the poor are more resource dependent than the rich, in quantity terms they are not the main users of environmental resources. Data shows that the richest quintile consumes approximately 3-4 times the value and hence quantity of environmental resources compared to the poorest quintile. This suggests that comparative affluence rather than comparative poverty could be the main issue of concern. The study affirms the importance of maintaining the commons especially from the perspective of the welfare of poorer households. Moreover, it points out that studies that ignore the contribution of environmental resource utilizations, miscalculate measurements of many rural phenomena such as incomes, consumption, and expenditure.

(Murombedzi, 1999) has made research work on Devolution and stewardship in Zimbabwe's Communal Areas Management Programme (CAMPFIRE) programme. In this study, Murombedzi has analyzed that Zimbabwe's CAMPFIRE for indigenous resources, based on decentralized management of wildlife resources is well recognized as one of Africa's most successful conservation initiatives. Started in the early 1980s, it

involves a shift in power from the central government to local communities and institutions, in particular Rural District Councils (RDCs) to limit arable agriculture, grazing and livestock through collaborative land use planning. Further, it enables residents of communal lands, primarily poor black people to share the benefits generated by wildlife utilization on those lands. In this paper, the author discusses some of the challenges still faced by the program. He points out that even though revenues are highest in wards where wildlife density is highest and human population density is lowest, Masoka ward (considered as a prime CAMPFIRE ward) continues to actively attract people to come and settle there. This is because the only way to get the government to invest in basic infrastructure is to have a sizable enough population. Further, research shows that most CAMPFIRE wards invest wildlife revenues not in improved wildlife management but in improving agricultural productivity. Moreover, while CAMPFIRE has displaced local economic imperatives, wildlife revenues have not become the main source of household income in CAMPFIRE areas. The author's contention is that problems such as population in migration, extension of cropping and increased livestock numbers arise to a significant degree because the CAMPFIRE program has devolved authority over natural resources from the central government to the RDC but not to the local communities themselves. While local communities can benefit from the use of wildlife by others, they have no right to use wildlife directly. Hence, they do not view themselves as joint owners of wildlife and have little stake in investing in wildlife conservation.

(Place, & Otsuka, 2000) made a research study on Population pressure, land tenure, and tree resource management in Uganda. They assessed changes in land use and tree cover density was made for 64 parishes of East--central Uganda between 1960 and 1995. Additional data were collected on population, tenure, access to markets, and other factors, and were used in models to explain changes in the land use and tree cover variables. Conversion of land into agriculture was heavily influenced by population pressure and was greater under the customary tenure system. The change in tree cover density was not linked to population pressure, and for agricultural land, was higher under the more privatized tenure system.

(Sierra, 2001) studies about the Impact of the timber trade on tropical forests have often oversimplified process complexity and underestimated regional variability. This study shows that forest degradation and clearing in Northwest Ecuador between 1983 and 1992 was closely linked to commercial logging. A key finding is that domestic demand is critical for shaping timber extraction and, hence, forest degradation and deforestation in this region. Low timber prices for roundwood and sawnwood at the origin, which are bolstering unsustainable forest extraction, have not been affected by market

liberalization. This suggests that conservation initiatives that target international trade linkages may only be partially successful, even when they do what they are intended to do. Results suggest that market-based incentives are more likely to produce the desired results if they target and support timber producers directly. These findings are also relevant for other regions where domestic markets are a significant drive for deforestation and where local markets are supplied through the activities of small-scale, labor-intensive primary producers. Also, by emphasizing areas where logging is a dominant force, meso-level studies, like this one, not only help to more accurately estimate the impact on local forests, but also identify major resource flows and the factors promoting or hindering sustainable use, and those affecting the effectiveness of policy options.

(Maestad, 2001) published an article on Timber trade restrictions and tropical deforestation: A forest mining approach in India. When monitoring or enforcement is difficult, governments may find it impossible to manage village forest commons directly. Village-level institutions might be better able to manage these commons, yet villagers' management objectives may not coincide with those of the state. This article considers the effects of two different government policies on the local management of village commons. One policy tool attempts to induce villagers to conserve forest commons by giving them a share of the timber harvest. He investigates the question of whether or not this scheme Joint Forest Management (JFM) is preferred either by the villagers or the government to a simple benchmark policy, under which the government harvests at random. He shows that, when villagers are sufficiently patient, for any equilibrium JFM policy there exists a benchmark policy that gives villagers the same level of utility. However, whether the government is similarly indifferent between these two arrangements depends on the villagers' ability to enforce collective agreements, and on the curvature of villagers' utility functions.

(Kohlin & Parks, 2001) published an article on Spatial variability and disincentives to harvest: Deforestation and fuel wood collection in South Asia. In an article they have attempted to show a major strategy to combat deforestation caused by household fuel collection has been the establishment of populations, especially in India. A household model is specified with a number of collection possibilities and analyzed empirically using household, vegetation, and GIS data, and the potential decrease in collection from the natural forest is estimated. The results show reduced pressure on the natural forest due to establishment of plantations. It also questions buffer zone plantations very close to natural forests.

In response to the writings from many demographers and resource economist who suggest that overpopulation and market pressures lead to over harvesting. By implication, as market forces expand local resource systems, these analysts (Verma, & Partap, 1992; Young, 1994; Chomitz, 1995) would argue, develop closer connections with external market systems and find a greater exposure to demands from a larger system. Greater harvesting and degradative pressures, thus, would come to impinge on finite local resources. Thus, they viewed the relationship between increasing marketization and environmental degradation are usually, negative. The role of roads and better transportation links is viewed as critical in this regard. Increasing population pressure and marketisation have resulted in degradation of commons in developing countries (Palo & Mery, 1990; Ehrlich & Ehrlich, 1991; Myers, 1991; Palo, 1993), whereas some researchers claim state interventions to be equally important (Salih, 1990; Shanmugaratnam et al., 1992).

Heated groups of researcher (Acheson, 1989; Chhetri & Pandey, 1992; Feeny et. al., 1990; McKean, 1992a) were against about the efficiency of local institutions as resource managers. But according to other theorists (Acheson, 1987; Ostrom, 1990; McKean, 1992b; Peters, 1994; Wade, 1986a, 1994b), local communities can create and sustain local institutions to manage their collectively owned resources quite successfully, often in the face of adverse pressures from the state, demographic changes, and market forces. Their emphasis on institutions as humanly devised rules (Bates, 1989; North, 1990). In highlighting community, theorists of community management often ignore politics and how it structures interactions among local populations, both within, and between communities. Much of this writing also tends to valorize local participation, without adequately focusing on the specific types of participation that may be critical to the success of resource management threaten to hobble the persuasive power of the writings on community management of resources.

(Bromley & Chapagain, 1984; Bromley & Cernea, 1989; & Shanmugaratnam, 1996) concluded that development policies together with demographic and technological changes lead to the continuous shrinking of common pool resources (CPRs) and the breakdown of traditional CPR management institutions. For example, policies related to land reforms in developing countries have tended to be preoccupied with the institutionalization of private property regimes while neglecting the task of creating an institutional environment for viable CPR management. A few others advance a provisional theory of resource degradation as a vicious circle, whereby population growth, increasing demands and access roads appear as driving forces (Palo & Salmi, 1987; Palo & Mery, 1990; Verma & Partap, 1992; &Young, 1994).

3.2 Review of Literature: National Context

(His Majesty Government/Asian Development Bank/Finnish International Development Agency (HMG/ADB/FINIDA), 1988a) prepared a Master Plan for the Forestry Sector (MPFS) to stop or reverse forest degradation with realization that there was urgent need for comprehensive guideline and new legislation for the forestry sector. As stated in MPFS:

"Nepal's forests are declining in both quantity and quality. Over the last two decades, more than half a million hectares have been lost. The remaining accessible forests have been degraded, so that they now consist mostly of mature and over mature stands, with poor prospects for regeneration" (HMG/ADB/FINIDA, 1988a, p.1).

In a donor's meeting in 1984 the idea of a Master Plan was brought up co-funded by HMG/ADB/FINIDA with a total volume of US$ 1, 742 million for a 21-year (1989/90-2010/11) implementation phase. The project's document was divided by14 volume to assess the existing forest legislation with main aim of protection as stated in MPFS:

"The existing forest legislation was formulated to resolve the past problems related to protection, rather than the present and future needs for better management and increased production. As a result, the current legislation does not accord any longer with the spirit of the new forestry sector policy. The weakness is particularly conspicuous in the case of community forestry policy is now clearly in favour of people's participation but the prevailing legislation is the Forest Act of 1961, whose original spirit aimed at preventing the common man from entering the forest at all. However, various implementing rules have been formulated in the modern spirit, allowing people to develop the resource to meet their needs since 1977'' (HMG/ADB/FINIDA, 1988b, p.6).

In the revised version of the Forestry Sector Policy (HMG/ADB/FINIDA, 1989), this contradiction is stated even more clearly. "Contrary to the (1961-Forest) Act various implementing rules have been formulated in the modern spirit of allowing people to develop the resources to meet their needs since 1977. This legislative contradiction must be eliminated as soon as possible" (HMG/ADB/FINIDA, 1988b, p.6). At the same time it was recognized that forest policies need to be incorporated into broader, long-term development imperatives. Thus it was considered important to incorporate the following issues as stated in the executive summary of MPFS (HMG/ADB/FINIDA, 1988c, p.8).

1) satisfaction of basic needs (for firewood, timber, fodder);
2) sustainable utilization of forest resources;
3) participation in decision-making and sharing of benefits; and
4) socio-economic growth

These four development issues are followed by the even more important statement that "the above imperatives are not options from which the government may choose a most suitable policy" and carries on to point out that if any one of them is disregarded, the entire forestry sector policy may fail, and that "the failure will produce disastrous consequences-environmental, ecological economic, social, cultural, or political. The imperatives are neither negotiable nor speculative" (HMG/ADB/FINIDA, 1988c, p.9).

In the volume on Forestry Sector Policy to ensure basic needs and the commitment to consider the poor are again taken up:

"The forest resources of Nepal will be managed and utilized so as to give priority to the products that can best contribute the basic needs of the people. The priority products are fuelwood for cooking, timber for housing, fodder for domestic animals and medicinal herbs for health. The principles of the decentralization policy will be applied in the forestry sector by community forestry, which will have priority among other forest management strategies. Priority will be given to poorer communities or to the poorer people in a community" (HMG/ADB/FINIDA, 1988d, p.10).

For an effective implementation of new forest policy the Master Plan purposes a total of six primary programmes such as community and private, national and leasehold, wood-based industries, minor forest products and conservation and six supportive programmes such as policy and legal reform, human resource development, forest research and extension, information and planning, monitoring and evaluation. The budget was allocated US$ 811.2 million (46.6 percent) for community and private forestry component and US$ 352.4 million (20.3 percent) for national and leasehold forestry whereas budget of US$ 80-116 million was allocated for the remaining four programmes. Similarly, among the supportive programmes, the human resource development received the highest financial priority amounting to US$ 82.7 million, whereas the other supportive programmes were budgeted with only US$ 2-36.6 million. A comparatively low budget of US$ 5.5 million was allocated to the monitoring and evaluation programmes, accounting for only 0.3 percent of the total volume calculated for the implementation of the Master Plan.

The Forestry Master Plan certainly is an ambitious project in order to improve the conditions of forests by modifying the policy sector, which was considered to have previously been ineffective but it also demands a substantial financial input. Whereas the 7th Five Year Plan (1985-90) allocated a budget of NRs 1,181 million to forestry sector (HMG/NPC, 1985: 178), i.e. 4.8 percent of its total budget and an annual average of NRs 236.2 million (equivalent to about US$ 13.42 million at the 1985 rate of NRs 17.60 per

Dollar) the budgeting according to the Master Plan required an average of annually about US$ 83 million, i. e. more than six fold.

(Bajracharya, 1981) published a case study research report on Fuel, food or forest? Dilemmas in a Nepali village based on authors Ph.D. research dissertation in east Nepal- Pangma VDC, Shankhuwasbha district, which lies in Arun river valley. This study from a village development committee in the east Nepal, hill region of Arun River Valley demonstrates that deforestation is caused not so much by fuel wood demand as by the need to clear forest areas for food supply. The method of analysis uses by researcher are questionnaire survey, participant observation and direct measurements in a micro set up to assess the demand, as well as the supply systems of food and fuel and to analyze the impact on deforestation. Policy implications suggest that to control deforestation, food production and distribution practices need to be improved, existing forest need to be managed better to increase sustainable fuel woods supply and the direct participation of local people is indispensable to desired improvements. The author of this study gave the result that food deficit leads to deforestation and food deficit lies at its root. However, he nowhere in his study had attempted to highlight irrigation as a critical possibility to increase the productivity of land. Without proper irrigation facilities agricultural productivity could not increases and food deficit also could not removed and hence there will be possibility to clear forest for the food factor.

(Acharya, 1986) had conducted a research for his Ph.D. work on Jirel property arrangements and the management of forest and pasture resources in highland Nepal. In this study he examined social structure, land tenure and natural resource, use among the Jirel people of highland Nepal using household survey, participant observation in Jiri river valley. The most striking result of his research was that even with increased external pressures, the Jirel people have maintained a balance between the use of wood and its sustainable availability in their forests. Local needs and management practice have achieved a remarkable, although certainly not perfect, balance between human needs and wood resources. The substantial autonomy Jirel have enjoyed in managing their forests and pastures and the flexible systems of property and management they have practiced, have enabled them to meet their resource needs without depleting the resource base. Allowing still greater opportunities for local management and maintaining more flexibility in policies to address diverse and changing situation may enable the government of Nepal and donor agencies to alleviate poverty and maintain the physical environment at the same time.

(Graner, 1996) has made a research study under her Ph.D. academic work on User group forestry - poor policy for poor people? Nepal's forest legislation from a political ecology

perspective. In this study she has made two case studies in two VDCs of Sindhupalchock district namely Melamchi VDC middle Mountain region of Sindhupalchok district and Kiul VDC - the high mountain region in upper Melanchi Khola of the same district using secondary and primary data analysis based on interpretive research methodology. Findings based on seven + five (partial) ethnicity case studies have showed that this often praised policy of user group forest management has extremely negative effects upon groups which are excluded from membership, who heavily depend upon these resources in order to meet their subsistence needs. Participation in consumption and representation in user's committee was found to be highly selective and strongly favoring high caste and high economic status groups whereas the people and low economic status are often not included. These case studies conducted by Graner provide evidence that the registration of forest user groups can be seen as one of many investment strategies for high income households whereas they can not be seen as a at risk contribution to securement of basic needs for forest products for groups whose basic needs are generally at risk.

In a study of Two FUGs from Dhankuta and Terhthum districts of the Koshi Hills of Nepal, (Bhattarai & Ojha, 2001) had shown that there is markedly different benefit-cost ratios of community forest management between three income groups. They conclude that benefit-cost ratio for poor households are (0.94), for medium households are (1.17) and for rich households are (1.10). This indicates that the poor users are getting negative net benefits from the community forests. The middle-income group is getting the highest net benefits followed by the rich income group of households.

In a study of eight FUGs on Property rights and natural resources: Socio-economic heterogeneity and distributional implications of common property resource management from Kavre and Sindhupalchok districts of the mid-hills hills of Nepal, (Adhikari, 2003) arrives this conclusion that poorer households are currently benefiting less in absolute terms from community forest than less poor households. In terms of the contribution of forests to household income, the study results suggest that the poor are not necessarily more dependent than the rich based on household level primary data of 330 household surveys. However, his hypothesis was that in relative terms, the poor are more dependent forest resources than non-poor rural households.

The Forest Act 1993 and Forest Rules 1995 of Nepal came in place with an increasing emphasis on community-based resource management under the communal collective property regimes to have a focus on poverty alleviation giving priority to the poorer people in a community. The intention of this new Forest Legislation was that giving formal communal property rights to local user groups provides them with an incentive to

manage and extraction of fuelwood, fodder, and other forest products in a sustainable and equitable manner and community welfare will increase as a result of an increase in forest resources and halting degradation.

To understand the impact of different independent variables on equitable use of forest resources with maintaining forest condition, local institutions can be seen as mediating variables influencing the impact of other socio-economic, demographic, road access and market forces. This view of the relationship between local institutions and other factors allows a bringing together of much research on resource use and management and permits a simultaneous examination of different variables affecting resource condition. If existing work has not followed the varying impacts of different factors on equity issues and environmental justice by examining micro-level processes, it has been even more deficient in empirically testing the impact of defacto regimes of community forest management and efficient use. Although the belief is widespread that privatized access, use, management, and control over resources leads to efficient use, this belief has seldom been tested systematically or empirically. Significance of efficiency should view in the context of equity. On the other hand, it is also not clear whether clearly defined rights on common property resources in terms of sustainable use and conservation of resources from a given groups of community forestry are the best decisive factors to evaluate the effectiveness of a given rules of local level collective action where renewable natural resources for equitable distribution are at stake. Because these resources play a role in a livelihood system of rural poor that cannot be substituted by any alternative compensation.

Though there is an impressive upsurge of theoretical as well empirical literature on the role of community-based institutions, none of it has provided solid evidence on equity and distributional implications of local level collective action. Efficiency of resource use, equity of resource distribution and conservation of resources are insignificant of such a persistent socio-economic inequality and pervasive poverty in rural communities unless specific measures of compensatory transfer schemes are in place to safeguard the interests of the most vulnerable section of the rural poor. Thus, significance of conservation, efficiency and equity should view in the context of specific poverty-environmental benefit interventions along with NRM and non-NRM related measures so that any one could see the far-reaching consequences of these to rural poverty reduction and sustainable community forest resource management in Nepal.

In summary, in the last two decades several studies have focused on local-level solutions to resource management problems with approaches biased towards their respective disciplines. Different disciplines view interactive processes between communities and resources through their own theoretical lenses, but for all of them, institutions matter. Consistent with the growing theoretical literature, there is a large amount of empirical

research dealing with poverty, inequality and the dependence of rural poor on CPRs (Jodha, 1985, 1986, 1990, 1995; Iyengar, 1989; Beck, 1994; Singh *et al.,* 1996; Iyengar & Shukla, 1999). On the other hand, many noted scholars on commons have indicated that equitable distribution of forest benefits within the socio-economically diverse rural community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated (Garner, 1997; Adhikari, 1996, 2002a, 2003; Malla, 2000; Springate-Baginski *et al.,* 1999; Richards *et al.,* 1999). They argue that despite having the most pioneering forestry policy in place to promote community-based forest resource management, the community forestry in Nepal is said to be unable to distribute the common property forest resources and provide a significant contribution to the livelihood of poor and marginalized people. The restriction posed on the collection of various non-timber forest products after the institutional change actually hurt poorer households whose livelihoods were traditionally closely linked to the collection of these forest products. The main reason of community forestry not to be poverty responsive may be the basic policy objective remains only the fulfillment of subsistence needs and its failure to take into account well being benefit approach for sustainable use and equity of forest resource distribution within the rural poor communities (Dahal, 2003).

Thus, there are a number of theoretical and empirical studies on community-based natural resource management based on collective action, property rights, conservation and sustainable resource management. Efforts to improve the management of natural resources, however, often focus narrowly on the technical characteristics of the exploitation or conservation of the resources while giving short shrift to the social and institutional structures that are needed to manage those resources in a more sustainable and equitable manner. There has been comparatively little research on the nature and extent of inequalities within CPR institutions, problems of internalizing the externalities and their benefit distribution and cost sharing implications for different economic and social groups. This is an area that this study seeks to bridge this gap in understanding about how and to what extent different caste and income groups of households are dependent on community forest despite recent policy shifts towards community-based forest resource management in Nepal.

It is necessary, therefore, to investigate the effectiveness of local CPR institutions and policy shifts whether community-based forest resource management in Nepal have increased access to community forest resources for poorer households. Thus, at a more general level, this research aims to verify the victim hypothesis by investigating to what extent has community forestry been contributed to the household level welfare of poor people. Moreover, at a more specific level, this research aims to provide the empirical evidences of differential distributional impacts and externalities effects of community forest management on the poor and non-poor households at the local level.

CHAPTER 4

4 REVIEW OF THEORIES OF DEVELOPMENT, POVERTY AND NATURAL RESOURCES

Definition and concepts of development, poverty and natural resources over the period 1960-1990s vary in regard to the level of theoretical sophistication with which it approaches the problems of development and management of natural resources focusing poverty reduction in developing countries. We have until now some broad theoretical perspective from which the issue of development through management of natural resources to reduce rural poverty has been addressed.

4.1 Theoretical Underpinnings

There is no any single ready-made theory to support and examine the questions specified above. The institutional economics of local resource management and theoretical developments in the area of people's participation, decentralization, social capital, and property rights structure involved in local common resource management institutions provide the necessary theoretical milieu for the present study. Based on institutional perspectives, this study seeks to examine the victim hypotheses and externality issues focusing the distributional implications of CPR management under the border area on rural poverty and natural resources in Arun River Valley. In particular, since it is better to look at potential benefits and costs as a positive and negative externality of CPR to forest-related institution, the institutional analysis framework as developed for forestry studies around the world (Ostrom, 1990, 1997; Agrawal, 2000) had also provided necessary information for the present research study in a significant way.

From the 1960s on, economists started confronting the assumptions of neoclassical economics. (Eggertsson, 1990, 1996) had said that the research took two paths: one, which still had links to the traditional neoclassical school, but with the relaxation of assumptions of costless information and zero transactions costs (North, 1992). He refers to this as the Neo-institutional Economics (henceforth NIE). The other path, according to him took cognizance of Simon's 'satisfying' and bounded rationality and wholly rejected the rational choice model (Williamson, 1975, 1991). Eggertsson refers to this as the New Institutional Economics. The study has concerned here with both the 'paths', but primarily with the first one. The major theoretical contribution to NIE has been that of (Coase, 1937, 1960). Coase's contention was that transaction costs are not zero and this

has an implication for the equal allocation of resources, property rights, associated costs of resource use and management and the structure of economic agents.

According to this theoretical framework, issues such as victim hypotheses and externality of local CPR management institutions where whether they affect equity of resource distribution and condition of management practices towards rural poverty reduction. Local common property resource management institutions can be seen as sets of formal and informal humanly created rules that enhance stability of expectations in human interactions and guide human-nature interactions. They constrain some and facilitate other human activities; indeed, without them, social interactions are impossible. The manners in which they mediate, soften, attenuate, structure, mould, accentuate or facilitate particular effects raises the costs of some actions in comparison to others. Rules, laws, norms, social conventions, networks, families, clans, organizations, and markets -- all of these entities are also incorporated in this study and viewed as social institutions and analyzed within an institutional framework.

As we have seen in literature of development, it offers us some theories, which are as follow:

4.1.1 Theories of Development and Economic Growth

In the 1960s, development meant an acceleration of economic growth, as measured, for example, by GDP or GDP per capita. The approaches used generally concentrated upon accelerated industrialization and import substitution (of manufactured goods and capital equipment). The strategy used was rapid increase in real GDP, faster than population growth, usually through accelerated industrialization.

(Dahal, 2004) has noted that development paradigms have changed over the years. He cites the ideas of (Korten, 1990 & Sen, 1999) regarding the development paradigms to support his argument. He writes in the preface "Development has had different paradigms shifting from Harrod-Domar model to improving investment, empowerment and social inclusion. David C. Korten, in his publication titled *Getting to the 21st century: Voluntary action and the global agenda* (1990) criticized the growth-centered vision, which he called a product of cowboy economics and propagated the philosophy of the people-centered vision for development in poor countries. Amartya K. Sen in his publication *Development as freedom (1999)* emphasized that development requires removal of: "poverty as well as tyranny, poor economic opportunities as well as systematic social deprivation, neglect of public facilities as well as intolerance or overactivity of repressive states.Despite unprecedented increase in overall opulence, the contemporary world denies elementary freedoms to vast numbers-perhaps even the majority-of people" (Dahal, 2004, p. iv).

4.1.1.1 Theory of Rapid Socio-Economic Development

In the 1970s, development came to include attention to infrastructure, usually urban and inter-urban transportation. Since then it began gradually to include the social dimension of development, from health and education to housing. A new emphasis on the need to develop rural areas became prevalent. An additional correction to the concept was the need to focus upon "appropriate technology"—i.e. not simply labour intensive, where appropriate, but involving equipment and methods of a technical level appropriate to the resource/skill context of the country in question. The strategic solutions were adopted such as increase in real GDP per capita and investment in infrastructure and health, education, social services and increase in real GDP per capita and socio-economic development, using employment-generating appropriate technology.

4.1.1.2 Theory of Integrated Rural Development

In the beginning of 1980s development was viewed as a multifaceted incorporated into socio-economic development with appropriate technology. To reduce rural poverty strategic priority were given to increase real per capita GDP and socio-economic development using appropriate technology and multisectoral integrated rural development to combat rural poverty and raise agricultural production

4.1.1.3 Theory of Environmentally Sustainable Development

In the 1980s, the need to prevent development initiatives from damaging sensitive ecological environments was recognized, and the concept of "sustainable" development was born and has become widely promulgated. Here too, to reduce rural poverty strategic priority was given to increase real per capita GDP with care of environmental protection and not deplete non-renewable resources and socio-economic development using appropriate technology and multisectoral integrated rural development to combat rural poverty and raise agricultural production.

4.1.1.4 Theory of Participatory Development

By the early 1990s, the need to address the hitherto overlooked needs of women came to the forefront of the development debate. In 1995, the Social Summit signaled the fact that development needed to address the needs of the poorest of the poor. Since then it was realized to include poorest of the poor not only among the priority beneficiaries of development programmes but also as full participants in the twin process of socio-economic development design and delivery and political decision-making, with the potential of making a major contribution to the development process.

Since the Social Summit, development policies and projects that address urban needs without addressing rural needs. They include capital projects but fail to recognize the importance of people-centered, income and employment-generating projects under sound consideration. On the other hand, they did not addressed specifically the special needs of women, that create economic wealth at the cost of environmental damage, or that exclude the poorest of the rural poor as full participants-regardless of how much GDP per capita is increased or how many miles of roadway are built. This theory also has the strategy focus upon improving living standards of the poorest, which is hitherto often bypassed by socio-economic development efforts, prioritizing the needs of women which is also hither to often excluded from the development process, and recognition of the needs of the poorest, by gender, age, special groups. Currently, the participatory theory of development is offering a strategy of participatory involvement of the poorest in rural areas in the design, implementation and monitoring of development efforts.

4.1.2 Theories of Poverty

"Poverty must be one of those few areas where the medicine is prescribed before the malady is known" (Else Qyen).

The problem of poverty has been a debatable subject and controversial questions among the scholar of economics, sociology, political science, policy making and resource economics. In spite of large volume of literature and theories on poverty, there is hardly any country where poverty is completely reduced. This indicates that as the poverty increases theories of poverty are also increasing. That is, poverty exists in almost all countries of the world but the extent, magnitude and severity of poverty incidence across the countries are found different. Some theories of poverty mentioned here varied explanations and lead to varied policy recommendations for the reduction of poverty.

4.1.2.1 Neoclassical Theory of Poverty (Market-Led Development)

The neoclassical theory of poverty, which is based on market-led development approach, argues that market-led economic activities is the only persuaded way to reduce poverty and improve people's living standards in the long run. However, it does not dispute alongside "safety nets for the poor" insofar as such protective measures do not inhibit the operation of market forces. Under the influence of the structural adjustment policies advocated by the World Bank, this approach has increasingly acquired a hegemonic position in development thinking worldwide. As an alternative of this approach, (Bhalla, & Glewwe, 1986, 1988) were seen innovative in World Bank funded studies in Sri Lanka. In comparing the social indicators for Sri Lanka for the pre-liberalization era and the post- liberalization era, with 1977 as the point of transition, they concluded, "the

evidence examined in this paper… suggests that the post-1977 policies have not been detrimental to the equity objectives and may offer more promise than those which they replaced"(Bhalla, & Glewwe, 1986, p.62). As one commentator noted, this approach assumes "that all development activities implicitly embodied objectives of poverty reduction, and that positive progress would be achieved through the process of 'trickle down'" (Easter, 1980, p.1). There are, However, wide-ranging criticisms against the market-led policies as they relate to poverty in SARC countries. Using Sri Lankan data, (Lakshman, 1994) argued that market-led policies have had adverse consequences on the poor.

The application of the neoclassical approach to the green revolution in Panjab parts of India and Pakistan highlighted the positive economic and social benefits. (SAARC, 1992) on poverty alleviation signaled "The green revolution transformed the rural-traditional economy, created work with good wages even for the landless, stimulated a different type of industrial growth which evolved spontaneously out of the input and demand linkages produced by agricultural production and incomes" (SAARC Report, 1992, p.17). Contrary to this, (Mundle, 1984) appears more cautious in interpreting the social outcomes of green revolution. He argues about the recent changes in agriculture in rural Panjab in this way: "The principle factor accounting for the decline in rural poverty in Panjab would appear to be the improving production performance of agriculture, measured here as the level of per capita food grain production. The positive income effect of agricultural performance has been reinforced by the positive income effect of rising food grain prices… However, the later effect is quite weak. This is because the rising food grain prices have a positive income effect on the class of net-selling cultivators, but this positive income effect is offset to some extent by the negative income effect of rising grain prices on agricultural labourers who may have to buy at least a part of the family's grain requirements from the market" (Mundle, 1984, p.104).

In the same line as above, regarding the applicability of neoclassical approach to reduce poverty in rural areas, (Mukhopadhyay, 1985) also concludes "that broad-based programmes of the productivity-rising type have benefited the rural poor to some extent but their benefits to the rural rich have been disproportionately high"(Mukhopadyay, 1985, p.29).

4.1.2.2 Political Economy Theory of Poverty

The theory of political economy about poverty asserts that poverty is a product of certain economic and social processes that are inherent to given social systems. The theory assumes that there is a conflict of interest between the rich and the poor in society, and that the poor remain poor not because of any individual or personal qualities, but because

society denies them the legitimate share of benefits that should accrue to them. The notion of class is central to the theory of political economy to poverty. (Griffin & Khan, 1985) reported:

"Our empirical work has demonstrated that poverty is associated with particular classes or groups in the community, e.g., landless agricultural labourers, village artisans, plantation workers, etc. Yet most of the theories and models are understood in terms of atomistic households in the classes of society. This neo-classical assumption is closely associated with the assumption of the universal harmony of interests. We do not believe it is possible to get very far in understanding the problems of the third world until it is more widely accepted that there are classes in society and that interests of the various classes often are in conflicts. Rural poverty cannot be studied in isolation. It has an historical origin and setting which simultaneously connect the present to the past and establish boundaries to what is possible in future. The history of rural poverty is of course part of the history of underdevelopment…Europe did not "discover" the underdeveloped countries; on the contrary she created them" (Griffin & Khan, 1985: pp.29-30).

This approach pays considerable attention to the historical context within which poverty evolved in south Asia. According to this approach, the roots of the current crisis in south Asia go back to the colonial period.

Using this same historical perspective, the significance of the development of a plantation economy in generating poverty and inequity in South Asia has been highlighted by other authors. (De Silva, 1982) for instance, argues that the super exploitation of labors and the transfer of surplus from the periphery to the center where the twin principals around which plantation economies were developed throughout the underdeveloped world.

In this approach, rural poverty is typically seen as a product of extreme inequalities in land ownership and control. Writing about poverty in Bangladesh, (Rahman, 1986) has noted: "Given the importance of agriculture in Bangladesh and of land as the primary agricultural factor of production, landlessness perhaps the most crucial element explaining the level and the growth of the poverty" (Rahman, 1986, p. 49). According to another commentator, given the significance of the land in production process in a largely unmordenized agriculture and its rather unequal distribution would be considered essential for ensuring a better living of the most disadvantaged commenting on the agrarian structure in rural Panjab, (Mundle, 1984) wrote:

"The extreme inequality of the pattern of land ownership can now be seen clearly. At the bottom of the scale, roughly half of the total number of households, in size class of one

acre or less own barely 1 percent of the total area and operate even less. At the other end, less than 5 percent of all households own as well as operate about 30 percent of the total area or roughly 20 to 25 percent of all households own or operate around 80 percent of the total area" (Mundle, 1984, p. 92).

The contrast between the neoclassical and the political economy approaches comes into sharp focus when analysis of the effect of the green revolution by these two theories is compared. Whereas neoclassical approach highlights the positive effect of the green revolution for all income categories, on the other hand, (Satya, 1990; & Harris, 1992) under the political economy approach, observed such as growing class differentiation as a negative outcome of the green revolution.

One of the weaknesses of the political economy approach, however, is that it leaves us with only a limited range of options for alleviating poverty.

4.1.2.3 The Culture of Poverty

Following the work of Oscar Lewis in the 1950s, the culture of the poverty approach became important in the study of urban poverty, especially in North America. This theory holds that poverty is not merely a lack of adequate income, but rather a way of life handed down from generation to generation. In contrast to the theory of the political economy, which looks for the root causes of poverty in larger structures of society, the culture of poverty attributes poverty to the subjective views of the urban poor themselves.

Only one study employed the theory of culture of poverty in the south Asian context. In their study of the urban poor in Sri Lanka, (Silva & Athukorala, 1991) discovered that films and football played an important role in shaping thinking and attitudes towards life. These authors, however, questioned the validity of the culture of the poverty thesis an explanation of the behaviors and altitude of the urban poor. Other studies too examined cultural beliefs as a factor in perpetuating poverty in parts of south Asia, but typically they did not consider them through the culture of the poverty thesis. One of the main criticisms against this theory is that it justifies the status quo and blames the victims themselves (the poor) for their condition. Because cultures are hard to change through intervention, it is of limited practical use.

4.1.2.4 Participatory Approach to Poverty Alleviation

Many past efforts to deal with poverty involved interventions from outside, whereby the poor themselves were seen as targets rather than decision makers cum actors capable of improving their own condition, given the right incentives and skills. The participatory approach argues that the only way poor can overcome their difficulties is by directly

participating in the formulation of the social policy, the development of programmes, implementation at the ground level, and sharing benefits of such programmes. The participatory approach has the dual goal of promoting growth and equity while also ensuring the development of democratic processes at the grass roots. During the 1980s, this approach became a dominant model for and intervention in south Asia. Both governments and NGOs have increasingly turned to this approach in their anti poverty programmes.

In the past ten to fifteen years, a sufficient body of experience has emerged which demonstrates that were the poor participate as subjects and not as objects of the development process; it is possible to generate growth, human development and equity. An in-depth analysis made of the micro terrain such as the women's development programme in India, the Aga khan Rural Support Programme in Pakistan…reflect the kind of social mobilization taking place where the poor has contributed to the growth and human development simultaneously under varying socio political circumstances. They also demonstrate that at the relatively lower levels of income it is possible to achieve a high level of human development. The participatory process itself ensures that the poor assert their right to resources and a fair share of the surplus. Lack of influence over decision-making has been identified as an important feature of poverty in south Asia. In a study of poverty in rural Sri Lanka, (Moore & Wickramasinghe, 1980) concluded "An important dimensions of poverty is lack of access to extra village resources, a result of lack of information, of useful social and political contacts and very importantly the ability to extract services from agencies of the government"(Moore & Wickramasinghe, 1980, p. 64).

The empowerment of traditionally disadvantaged segments of the population such as women, scheduled castes and tribes, and ethnic minorities is seen as an important means of promoting growth and equity. Describing the condition of poor women in south Asia, (Wignaraja, 1990a) confirmed that they suffer from "a double burden" in being women and poor at the same time. He stated "It is now well established that poor women have the least access to the basic needs such as food, health, and education both within the family and without" (Wignaraja, 1990a, p. 19). Although, achieving a level of success in promoting community participation, the ability of this model to alter fundamental structures in society and to promote growth and equity simultaneously is yet to be demonstrated in south Asia. In contrast to the political economy model the participatory approach advocates a gradual and bottom-up process of social change where the poor and the underprivileged gradually become full participants in the development and decision making process.

The problem of poverty is found both in the developed and developing countries of the world but in the developing countries it is so acute that many people go to bed with half a meal, many children die due to lack of medical care, many children do not attend school due to lack of a few rupees needed to buy text books and many people engage in immoral work to keep their body and soul together. Besides, extreme poverty of the country leads not only to the loss of human values but also to self-degradation (Dwibedi, 1974) and the poorest people find that their very poverty is a formidable barrier to their entry into many aspects of social and economic life (UNDP, 1993). In general, the vicious circle of poverty acts in developing countries and due to this very circle the magnitude and incidence of poverty has been growing over the years. On observing the actual conditions of living of the poor of various countries, scholars have remarked that the poor are born poor, they live in poverty and they die poor but poverty never dies in developing countries (Dwibedi, 1974).

A variety of theories, philosophies and reasons has been put forward to explain as to why poverty has been growing. One theory suggests that the root cause of poverty are economic inequality and exploitation, other argues that poverty is due to low income, low growth rate, low productivity of land and labour, etc. In fact, all these factors and many others have been contributing to the state of poverty. Besides, lack of access of the rural population to the social and economic services has also been contributing to further aggravation of poverty. Lack of physical infrastructure in the rural areas does not allow gainful economic activities thus contributing further to poverty (Mahat, 1992). Thus, the factors of poverty are not few but many and widespread. During the recent decades, social scientists have paid increasing attention to the problem of poverty. Reduction of poverty has become one of the major aims of socio-economic policy and is getting even more importance in the present situation of worldwide decreasing economic growth.

4.1.3 The Hypothesis of Poverty- Environmental/Natural Resource Nexus

The links between poverty and environmental problems have been acknowledged since the 1970s. The literature on poverty and the environment offers several theories and hypothesis about different linkages between poverty and environmental resources. However, to what extent are they verified or falsified empirically, or, what is truth and what is myth? Below an attempt has been made to review of two hypotheses focusing the linkages between poverty and environmental resources:

4.1.3.1 The Agent Hypothesis - poverty leads degradation

“Many parts of the world are caught in a vicious downwards spiral: Poor people are forced to overuse environmental resources to survive from day to day, and their impoverishment of their

environment further impoverishes them, making their survival ever more difficult and uncertain" (World Commission on Environment and Development, 1987, p.27).

The influential Brundtland Commission on Environment and Development expressed the view assuming that there is a causal relationship between poverty and the environment. A central premise of the Agent hypothesis is that there is a mutual and spiraling relationship between poverty and environmental resource degradation. The argument upholds that, mainly due to intrinsic short time horizons and risk, poverty encourages over-exploitation of the physical environmental resources i.e. forest resources, which results in further impoverishment. The hypothesis states a circular or a spiral relationship between poverty and environmental degradation; in other words, poor are the agent of environmental resource degradation. It suggests that environmental degradation leads to poverty, which in turn leads to further degradation.

(Dasgupta, 1993) describes how closely dependent poor people are on their surrounding environmental resource base for their livelihood, and how poverty can be a driving force to environmental degradation. Based on theory and some empirical evidence he argues that poverty is both a cause and effect of resource degradation or lack of access to resources, including natural capital. To exemplify the above arguments he describes how poor nomadic dry land herdsmen often are excluded from formal credit, capital and insurance markets and are forced to invest their capital in cattle, resulting in non-sustainable herd sizes and overgrazing. Probable explanations to the agent hypothesis are that (i) poor people have shorter time horizon and (ii) higher risk-aversion and a propensity to use implicit, higher discount rates, which leads us to the following discussions.

Poverty leads environmental degradation due to shorter time horizons of poor people. The proponents of agents hypothesis so they say that, poverty often results in myopic production and consumption decisions, and precludes longer term investments in preservation and accumulation of natural capital (Holden et. al., 1996; Prakash, 1997). Consequently, poor people's limited economic options and low savings rates cause them to deplete and degrade their immediate environment (soils, forest, fisheries), and impose externalities on future generations.

Poverty increases risk-aversion and discount rates, aggravating environmental pressure. It is often assumed that poorer people have higher discount rates than richer people. For example, the World Bank's Forestry Policy cites "high private discount rates, especially among poor people who depends on the forests, as a driving force behind deforestation" (World Bank, 1991, p. 11). (Pearce & Warford, 1993) identify a vicious circle between poverty, high discount rates and environmental degradation by arguing that: "High

discount rates are one cause of environmental degradation because they encourage individuals to opt for short-term measures that satisfy immediate needs or wants and to ignore more environmentally appropriate practices such as planting trees. In turn, this environmental degradation leads to the poverty that causes high discount rates" (Pearce & Warford, 1993, p.72). They also argue that poverty-induced high discount rates not only delay pay-offs and prevent investments in physical and natural capital, but also discourage investments in human-capital such as children's schooling. This would be particularly pertinent where mortality is high and prospects for formal employment limited. While higher discount rates among the poor could be explained by simple lack of resources which creates an urgent need for immediate gains, there is also the fact that poor people often have to borrow in informal, high-interest rate markets, as documented by (Leach & Mearns, 1991). (Rhoades, 1988) describes how poor farmers respond to enhanced levels of risk of crop failure by diversifying land allocation and scattering parcels over a larger area in consent with other farmers. By cultivating lands of different soil types, quality and altitude, they manage to reduce their risks from pest or climate variability in a cost-effective way. These results have important policy implications.

For instance, farmers with differing levels of wealth would have different willingness and ability to undertake long-term investments. For instance, a flat (uniform) subsidy of e.g. soil conservation to individual farmers would induce some (presumably the rich) to act on the incentive whereas others (the poor) would fail to act, due mainly to poor people's lower valuation of future benefits. Although poor people often have lower opportunity costs, and thus would be expected to invest in labor-intensive activities, their limited ability to wait distant, uncertain benefits-driven by high discount rates-would counteract such behavior.

Even if it is believable that poorer people have higher discount rates, the problem remains that this would deter them not only from conservation investments, but also from investments with a detrimental environmental impact. The same argument can be advanced with regard to risk aversion; it deters people from behavior that could be both environmentally benign, and environmentally detrimental. While the tendency to a lower investment level with higher interest rates is ambiguous in terms of environmental impacts, we can postulate (cf. Pearce et al., 1990) that higher interest rates makes it rational: (i) to more quickly exploit exhaustible resources (e.g. mineral deposits), as moving income forward in time is more important the higher the discount rate, and (ii) to maintain a smaller stock of renewable resources (e.g. timber, soil organic matter), as the relative return of these (generally) decline with size and the opportunity cost is higher the higher the discount rate. While sometimes tempered by the increased capital cost in a high interest rate economy, these forces do point in the direction of higher environmental

pressure. When capital costs are low, the incentive would be for poor people to quickly exploit what is immediately available.

Yet an increasing number of studies now indicate that, in many cases, poor people may be able to protect against environmental degradation despite increasing population or economic change (Batterbury & Forsyth, 1999). Scholars of commons like (Ostrom, 1990; Rhoades, 1988; Prakash, 1997; Jodha, 1986; & Bromley, 1992) are against the agent hypothesis suggesting that poverty does not necessarily imply short time horizons and environmental degradation. They argue that locally designed and governed resource management institutions provide resilience towards risks and exogenous shocks, and facilitate sustainable use over time. Accordingly, poor people do not inherently have relatively shorter time-horizons. They are forced to diminish their time horizon only when subject to external shocks or extreme events, it is argued. (Prakash, 1997) summarizes: "…it is not short time-horizons so much as exogenous factors and misguided policy and administrative mechanisms that are primarily responsible for the environmental degradation attributed to the poor" (Prakash, 1997, p. 7).

(Ostrom, 1990) observes that neither the state nor the market has been uniformly successful in enabling individuals to sustain long-term, productive use of natural resource systems in many locations. Instead, communities of individuals have relied on institutions resembling neither the state nor the market to govern resource systems with considerable degrees of success over long periods of time. Neighbors, driven by maintaining their reputation as reliable members of the community and recognizing the need for sustained future resource availability, expect also their offspring to be subject similar conditions. Hence, people have developed independent of the market and the State, sustainable CPR management institutions, which facilitate access to essential resources across time. Lists a number of empirical examples (Box 1) regarding the challenging of downward spiral of poverty–environmental degradation is presented in Appendix-C.

These examples of Box 1, such as in Appendices, indicate that local practices, shaped by a range of both formal and informal institutions, may mitigate the impacts of environmental degradation. In addition, they indicate that environmental degradation-as perceived by the international community–may refer to changes to landscapes that human societies have themselves shaped over time, and therefore are less easily defined as degradation (for example of Guinea, Box 1 in Appendix-C). However, this argument does not suggest that degradation does not occur, as the disruption of local adaptive practices may lead to the abandonment of conservation (such as in Machakos).

Some of the crucial institutions limiting access to resources include land tenure. Tenure can be secured in a variety of ways, including membership in local social and political institutions, participation in markets, and interaction with statutory legal frameworks. Evidence suggests that increasing poverty can weaken people's claims on land, meaning that alternative, and less effective, tenure structures are used. Research demonstrates how groups of farmers, workers, or others may act collectively to overcome general threats to tenure or resource access (Ostrom, 1990). The ability for groups to act collectively has largely discredited the 'tragedy of the commons' (Hardin, 1968) argument that competition between individuals for common property resources will result in degradation. However, debate is increasingly questioning how so-called 'communities' may in fact hide strong divisions among members along lines of gender, age, caste, etc (Leach et al, 1997).

Research on common property resource management has become increasingly concerned with the disputed role of group heterogeneity in determining the success of institutions (Baland & Platteau, 1996; Bardhan & Dayton-Johnson, 2000; Bardhan, 1993; McKean, 1992; Keohane & Ostrom, 1995; Wade, 1994; Velded, 2000; Dayton-Johnson, 2000; Varughese & Ostrom, 2001; Karaivanov, 2001; Adhikari, 2001).

Heterogeneity can have visible negative effects on CPR management in two different ways. First, socio-economic inequalities within communities are reflected in the form of heterogeneous performances for forest resources; consequently, management objectives become more diverse and challenging to effectively implement (Kant, 2000). Second, a high degree of heterogeneity can provide opportunities for powerful minorities to impose management rules that serve their own interests (Guggenheim & Spears, 1991). Individual with higher power influence the 'operational rules' that affect day-to-day operational modes of forest user groups, which in turn affects individual or group incentives for collective action. Thus, socio-economic differentiation can decrease the likelihood of successful collective action because of disincentives that result from divergence of interest among heterogeneous economic agent.

4.1.3.2 The Victim Hypothesis - The Rural Poor are more Dependent on Natural Resources

"Take care of the poor, and the rich will take of themselves". (Shepherd, Arnold & Bass, 1999)

According to victim hypothesis, poor people are more directly dependent on biological resources for their livelihood than richer people. Loss of flora and fauna is thus relatively more costly to poorer segments of society. Furthermore, poor people often are compelled to settle close to these resources commonly found in open access areas, to be exploited at family-labor costs only. People particularly dependent on biological resources include:

(i) Small-scale farmers, who often derive additional sources of income from wild fruits, nuts, berries, herbs, medicinal plants, bush meat and roots,

(ii) Trans-human pastoralists, who derive essential nutrients from similar wild flora and fauna in marginal areas such as dry lands, and

(iii) Artisanal fisherman who derive a variety of coastal and marine resources such as shells, seaweed, coral and fishes, which provide food, building material, ornaments, cultural artifacts and cash income.

The rural poor are heavily dependent upon natural resources for their livelihoods. It has long been recognized that the poor in rural areas have a close relationship to the natural resources for their livelihood and survival strategies, and that their lives are greatly affected by the way others around them use environmental resources. The World Bank has recently estimated that one quarter of the world's poor depend directly or indirectly on forests for their livelihood (World Bank, 2000a). The nature of the dependence of the rural poor on natural resources varies which can be shown by the following examples presented by (Shepherd, Arnold & Bass, 1999):

Main source of livelihood*:* People living in forest environments and practicing hunting, collecting and swidden agriculture (shifting cultivation) draw heavily on forest products, not only for subsistence but also for income from forest products. Forest-related income also includes that obtained by selling crops or livestock for which forest nutrients or fodder was essential (Shepherd, Arnold, & Bass, 1999). While some hunter-collector population have retained a self-reliant and subsistence way of life (Grenand & Grenand, 1996), (cited in Byron & Arnold, 1999), most are increasingly becoming involved with outside markets and goods. However, the level of forest dependency among these peoples remains high, as does the cultural significance of the forest to them. Swiddeners who practice a sustainable long-term fallow system are a much larger group of the forest dependent. However, the encroachment of migrant settlers into the forest, commercial logging concessions and government pressure to settle are forcing a shift to shorter fallow, settlement and less direct dependency on forests. Herders of the African Sahel, although often overlooked in this category, are likewise forest dependent, as their animals - camels, cattle, sheep and goats - browse trees rather than grazing for much of the year, particularly during the dry season (Shepherd, Arnold & Bass, 1999).

Filling the gaps: Communities draw on off-farm forest or woodland for inputs that cannot be produced on-farm or that can be more efficiently supplied from off-farm resources. Foods from the forest provide for those who do not produce sufficient food from fields and gardens and cannot afford to buy food from the market. Reliance on forest products to fill gaps and complement other sources of subsistence inputs and income is likely to increase, as has already been noted, when crop yields have been poor

and other sources of income are not available. Where access to forests has been relatively unrestricted, forest foods and income from forest products are often particularly important for poorer groups within the community. Although the wealthier in a community, with more resources to devote to forest product gathering and production, are often the heaviest users, the poor usually derive a greater share of their overall needs from forest products and activities. Ease of entry and proximity to widely dispersed rural markets enable very large numbers of people to generate some income from forest products. Forest products can therefore be very important to those who are unable to obtain sufficient (or any) income from agriculture or wage employment, and to those who lack other options. Because of the accessibility of the resource, women are often more reliant than men on forest products, obtaining from them income needed to feed and clothe the family, as well as fuel for cooking (Hopkins, Scherr, & Gruhn, 1994). In cultures where women and girls suffer from intra-household discrimination in food distribution, the contribution of forest foods can be very important (Shepherd, Arnold & Bass, 1999).

Commercial forest products: In much of the world, most employment in forest industries is in very small enterprises, often composed only of a few family members, rather than in the formal sector. For instance, a survey of 1991 in Zimbabwe estimated that 237, 000 persons were employed in small woodworking, carving, fuel wood and cane and grass product enterprises, compared with a reported 16, 000 employed in forestry and forest industries (Arnold et al., 1994). Growth and Equity through Micro Enterprise Investments and Institutions (GEMINI) Project, Bethesda, Maryland, USA, (Cited in Byron, & Arnold, 1999), where larger, modern forest industries have become established, they can provide wage employment for local people who can thus become less reliant on more arduous (Hard) and less rewarding forest product and shifting cultivation activities. Many forest industry jobs, however, tend to go to outsiders because of the skills required. In addition, employment in logging and primary processing can often be relatively short term. The temporary employment and income these industries provide needs to be set against their possible disruption of existing livelihood systems in forest areas. Moreover, in communities dependent on forest industries, closure of the industry can lead to a sharp decline in local livelihoods.

Thus, at the present the reliance by the poor on access to natural resources is still key. Attacking poverty in rural areas is then necessarily a matter of improving poor people's ability to derive sustenance and income from more productively and sustainably managed natural resources. Due to the exhaustible and/or degradable characteristics of forest resource, however, it is a renewable resource, which is declining with its overexploitation requires improved management techniques for resource users that

continue to grow in both numbers and consumptive habits. Efforts to improve the management of natural resources, however, often focus narrowly on the technical characteristics of the exploitation or conservation of the resources while giving short shrift to the social and institutional structures that are needed to manage those resources in a more sustainable and equitable manner.

Concern with the (declining) state of the environment at local, national, and global scales has often seemed to pit environmentalists and policy makers against the poor. Contributing to the problem is the way that the link between poverty and environment is often conceptualized as a "downward spiral" or "vicious circle." Population growth and inadequate resources for resource management are presumed to lead to the migration of the poor to ever more fragile lands or more hazardous living sites, forcing people living in poverty to overuse environmental resources for their daily survival. In turn, they are further impoverished by the degradation of these resources. Under some conditions, there are elements of truth in this perspective, but as an overarching model it is highly simplistic, and has often led to policies that reduce poverty at the expense of the environment, or protect the environment at the expense of poor people. Poor people, no doubt, usually earn a livelihood by means of a diverse range of activities. Environmental entitlements are one among several kinds of livelihood sources for poor people; others include, for example, the sale of labour. Nevertheless, it is commonly observed that environmental entitlements are especially important in the livelihoods of the poor, largely because of a lack of alternatives.

If causal relationship between poverty and the environment exists as observed by Brundtland Commission: What are the links between poverty and the environment? Does poverty cause environmental degradation? Does environmental degradation exacerbate poverty? A logical consequence would be that if the environmental degradation appeared, then poverty must be reduced or if poverty is widespread then the environmental surrounding must worsen. It is by no means obvious that there exists any sign of trade-off-causal relationship-between poverty and natural resource degradation. The links may be caused by specious variables, i.e. transformed into actions that affect both poverty and environment. Thus, environmental economists rightly said that poverty is not so much a cause of environmental degradation as a mechanism by which the true underlying causes are transformed into actions that degrade the environment. In other words, environmental degradation is a negative externality whose causal roots, as well as solutions, lie in institutional and policy issues rather than in poverty itself.

4.1.4 Property Rights

Property right means property to every one who is a member of an identifiable group. The essence of property right is exclusion of non-owners. Property right is a decision-making process whereby rules of access and use of common property resources (forest resources) are set for all the members of an identifiable group. Any management of natural resources needs the establishment of property rights. This is more important in the case of CPR because the management of commons without property rights may become "the tragedy of the commons".

Any management of natural resources needs the establishment of property rights. This is more important in the case of CPR because open access common property resources may become "the tragedy of the commons". (Gibbs, & Bromely, 1989) defined property as the result of a secure claim to a resource or the services that resource provides. It is not an object rather it is a social relation that defines the property holder with respect to something of value (the benefit stream) against all others. Property is as a social institution and not to any inherent natural or physical qualities of the resource (Bromely, 1992; McKean, & Ostrom, 1995).

Four types of property are recognized namely private property, state property, common property, and nonproperty (Bromely, 1992; Fenny *et al.,* 1990; Ciriancy-Wantrup, & Bishop, 1975). The essence of property is exclusion of non-owners. The primary difference among first three property regimes is the decision-making process whereby rules of access and use are set. With open access resources (nonproperty), there is no owner and thus no rights of use or duties of maintenance. Therefore, without defined ownership there can be no rights of exclusion; hence, any one may harvest the benefits of open access resources.

Berkes, & Farvar, (1989) identified two important characteristics of common property as being exclusion and substractability. They have provided idealized types of property rights relevant to Common Property Resource (CPR) as:

4.1.4.1 Open-Access

Free for all; resource use rights are neither exclusive nor transferable; these rights are owned in common but are open access to every one (and therefore property to no one).

4.1.4.2 State property

Ownership and management control is held by the nation, state or crown; public resources to which use rights and access rights have not been specified.

4.1.4.3 Communal property

Use-rights for the resources are controlled by an identifiable group and are not privately owned or managed by governments; there exist rules concerning who may use the resource, who is excluded from using the resource, and how the resource should be used; community based resource management system: common property.

Property Rights Analyses of how natural resources are “owned” and how the security of tenure may affect the utilization of resources. It may also include a discussion about the inequality of access rights, such as unequal access to land ownership that forces the poor to cultivate marginal environments.

Property rights fundamentally are less about people’s control over resources, and more about the relations between people over resources. Thus, to focus only on the poor without taking into account other stakeholders would not only ignore important justice and equity issues, but would also be politically imprudent and practically futile. (John, 1999).

Few would question that insecure property rights are a serious obstruction to investment in forestry. Secure property rights reduce the risk of free riding, facilitate contractual arrangements with outsiders (for example, allowing payments for externality benefits), and lower the discount rates of owners. But nothing prevents land users who have secure property rights from behaving in ways that impose social costs on others, and SFM or conservation is only likely when market incentives make it a more attractive livelihood or investment option than alternative land uses. Thus, in Costa Rica, it is recognized that forest owners also need environmental service payments to convince them of the economic case for forest retention (preservation).

The most common situation in which weak or ill-defined property rights lead to deforestation is in open-access forest where the state lacks the capacity to manage, and common pool regimes are absent or in decline. In the case of industrial forestry, concession agreements often last shorter than a full rotation cycle, encouraging over-exploitation. Where long-term usufruct rights have been granted to communities to encourage Stainable Forest Management (SFM), continued outside financial and institutional support is essential in the face of weak market incentives. Still, in Nepal, more subsistence-oriented community forestry has proven less dependent. In Hill Community Forestry of Nepal, Land belongs to the state, but user groups have conditional legal rights over trees on this land. Unsustainability of common property resources may rise because property rights are not complete, privately exclusive, enforced and transferable.

4.1.5 Public Goods and Common Property Resources

4.1.5.1 Public Goods

In theory, public goods are those nonexclusive and non-rival goods whose marginal cost of providing it to an additional consumer is zero or additional consumer does not add to cost and people cannot be excluded from consuming it, such as use of a street light by a vehicle. Once the streetlight is built and functioning, its use by additional vehicle adds nothing to its running costs. Similarly, the cost of one more viewer from public television is zero. Likewise, people cannot be excluded from consuming these goods. Being characteristics of nonexclusive goods it is quite impossible to charge for using them (Coase, 1974 : 357-376). These goods can be enjoyed without direct payment. National defense including streetlight and public television are some examples of nonexclusive and nonrival goods, which provide benefits to people at zero marginal cost. Being characteristics of nonexclusive and nonrival public goods, it creates a free rider problem- a problem arising in the case of public goods because those who do not contribute to the costs of providing the public good cannot be excluded from the benefits of the goods-people can enjoy the good or service without reducing others' enjoyment even if they do not pay.

However, some public goods are nonexclusive but rival. A river or a forest is nonexclusive, but fishing or harvesting of forest resources is rival because it imposes costs on other users: the more fish caught or forest product harvested by some one, the fewer fish or forest resources available to other users. Externality occurs in such a situation. Air is nonexclusive and nonrival, but it could be rival if the emissions of some industry adversely affect the quality of the air and the ability of other people to enjoy it. Public high school education is rival in consumption. There is an extra marginal cost of providing education to one more child because other children get less attention as class sizes increase. Likewise, charging tuition fees can exclude some children from enjoying education. Local government provides public education because it entails positive externalities, not because of it is a public goods. We can take another example of a national park. Part of the public can be excluded from using the park by raising entrance and camping fees. Use of the park is also rival. Because of crowded conditions, the entrance of an additional car into a park can reduce the benefits that others receive from it. To solve the free rider problem some excludability is needed. The free rider problem of government provided public goods can be avoid by charging the users fees. In recent years, users’ fees concept has become more common in many government provided services.

4.1.5.2 Common Property Resources

Common Property Resources (CPRs) are resources over which a local community has traditional access. These may include village pastures, forests, wastelands, irrigation systems and such other commodities having collective utilization. Such resources are accessible to the whole local village community and no one person can stake his own preclusive claim. But, unlike open access resources where people's use is on a "free rider" basis with no recognized property rights, in CPRs accessibility is exclusive (limited) with only the identified community having access to it and not others. In this sense, the resources share two broad characteristics. First, they are so large that any attempt to exclude potential beneficiaries from using them would be costly. Second, the supply of such resources is limited and consumption by one user reduces their availability to others. Due to several other characteristics of common property resources such as market failure, policy failure and externalities, there is need for collective efforts on the part of the users/beneficiaries for managing the resources**.** These are discussed as follow:

Market failure

Market failures mean that forest products are undervalued in the market place; at the same time as for forest services there is usually no market place. This discourages long-term investment in the resource and favors alternative land uses. However, the contrary that higher values encourage long-term investment in forestry is far less certain, since they can encourage forest exploitation when the regulatory capacity is weak. Even if market prices better reflect 'true' private costs and benefits, they favour short-term profit generation and pay no attention to irreversibilities or other environmental and social considerations. Therefore, the challenge is how to bring private returns and actions closer to socially desirable returns and actions, and to make sustainable forestry more attractive than alternative land uses. This implies the need for regulation over the freedom to pursue short-term profit objectives.

Market failure occurs due to absent, distorted or malfunctioning markets in which forest goods and services are undervalued or not valued at all. Sources of market failure include:

- Negative externality effects which are not 'internalized' in market prices
- Missing markets for environmental and other 'open-access' public goods
- Market imperfections, such as lack of information

Policy failure

Policy failures also mean that forest products are undervalued in the market place, while for forest services there is usually no market place. This discourages long-term investment in the resource and favors alternative land uses. However, the opposite that higher values encourage long-term investment in forestry is far less certain, since they can encourage forest exploitation when the regulatory capacity is weak. It occurs both when the state fails to take action to correct market failures, and when policies are implemented which further distort prices and cause disincentives for sustainable management. Common examples of policy failures are:

- Land tenure legislation which encourages clearance
- Weak state control over its forest estate; e.g. illegal logging
- Low forest fees which under price forest products from state land
- Protection of forest industries through trade restrictions
- Subsidized inputs and credit for land-extensive farming

Failure to intervene to close the gap between private and social returns can be viewed as a major aspect of policy failure.

Externalities

Externalities refer to the effects of benefits and costs of common property resource management activities by an individual not directly reflected in the market. An externality occurs when one person's consumption or production behavior affects that of another without any compensation. The benefits and costs of one's action are said to be internalized when one is made to bear them in full (Todaro, 2004). Externalities and CF goods are important sources of market failure and thus raise serious public policy questions. The price of the forest goods need not reflect its social value in consumption and management due to present of externalities. Therefore, some households may use or consume too much and some households may use or consume too little so that equity outcome of forests may be inefficient.

Externalities can be negative or positive. Negative externality occurs in the community forests when one income and caste group uses or consumes too little CF goods by sharing high common management costs than the other income and caste groups i.e. they are unable to internalize the positive externality in terms of benefits from CF as their rival do. Similarly, positive externality occurs in the community forests when one income and caste group uses or consumes too many by imposing common management costs on the other income and caste groups i.e. they are able to externalize the negative externality in terms of costs from CF as their rival could not do. Each of the income

group as well as caste group of households, however, have no incentive to account for the external costs and benefits that they impose or share to one another when making use and consumption decisions of community forests as a common property resources. Moreover, there is no market in which these external costs and benefits from the community forests can be transmitted into the price of forest products used by different income and caste groups of forest dependent rural households.

4.1.5.3 Common Property Resource Management and Game Theory

Common property resources are those resources to which anyone has free access. Consequently, they are likely to be over utilized. Air, water, fish in Open River or ocean, animal grazing and forest extraction is the most common example of the common property resources. Garrett Hardin's famous observation on the fate of common-property resources (Hardin, 1968), that they erode because people free ride on others, was telling such globally mobile resources as the atmosphere and the open seas. However, the "tragedy of the commons" is not necessarily an apt metaphor for geographically localized common property resources, such as irrigation water, woodlands and local forests, threshing grounds, grazing fields, inland and coastal fisheries, and swidden fallows.

The real tragedy of the 'tragedy of the commons' argument (Hardin, 1968) is that it was based on confused terminology and referred to open access rather than common property regimes. The conclusion was that this led to-that tenure security and incentives to manage open resources sustainability are possible only with private or state property regimes-therefore suffers from the same misunderstanding, and fails to admit the possibility of sustainable resource management under a true common property regime. The detail of this debate is not the concern of this study. However, it is now well established from an extensive body of theoretical and empirical research that, provided certain conditions are met, people can manage natural resources conservatively through institutional arrangements for their collective ownership, management and policing. Indeed, in many instances, it is precisely de jure (if not de facto) state ownership, or the threat of privatization that leads to a true 'tragedy of the commons', as illustrated by the transfer to state ownership of natural forests in Niger and other Sahelian countries that historically were sustainably managed by local communities. The difficulty of policing such resources in weak states with low administrative capacity, combined with the displacement of effective local-level management structures, has left them subject to open access in which there is no incentive for users to stint or manage the resource conservatively.

There is a form of CPR ownership of particular significance to the local people: i.e. communal ownership. The theory game has discovered that, typically, the local

commons are not open for use to all. They are not "open access" resources; in most cases, they are open only to those having customary rights, through kinship ties, community membership, and so forth. Thus, from the theory of games it is known for some time that the local commons can in principle be managed efficiently by the users themselves: there is no obvious need for some agency external to the community of users (e.g. the state) to assume a regulatory role, nor is there an obvious need for privatizing the assets. A large body of recent evidence confirms the theory’s prediction, in that members of local communities have often cooperated in protecting their commons from excessive use. (Dasgupta, & Heal, 1979) contains an early theoretical formulation of the commons problem and its various resolutions. (Fudenberg, & Tirole, 1991) have an exhaustive treatment in the context of repeated games.

CHAPTER 5

5 SOCIO-DEMOGRAPHIC AND ECONOMIC CHARECTERISTICS OF THE STUDY AREA

5.1 Socio-Demographic Characteristics

The study area has heterogeneous characteristics in terms of social and economic facets. Different ethnic and income groups of households and population are living together with different socio-economic milieu, i.e. own social values, norm, religion and cultural attributes and different economic status. This study has tried to analyze the socio-economic heterogeneous nature of the forest dependent rural population and households at the CFUG level.

5.1.1 Household and Population Distribution by CFUG and Sex

According to operational plan of each 16 CFUG, a total household numbers of the study area was 1227 in 2003. Out of this total, 399 households with average of 32 percent were surveyed. *Table 5.1* shows the distribution of households and population in different CFUGs in the study area.

Table 5.1

Distribution of Total Households, Sample Households and Population by Sex and CFUG

Surveyed Household and Population

Name of CFUGs	Total HHs*	Sample HHs*	Male	Percent	Female	Percent	Total	Percent	HH* Size
1. Panchakanya	59	19	49	49.5	50	50.5	99	4.0	5.2
2 Dakshinkali	55	17	57	53.8	49	46.2	106	4.4	6.2
3 Arunganga	96	31	102	53.1	90	46.9	192	7.9	6.2
4 Oiputang	75	24	57	41.3	81	58.7	138	5.7	5.7
5 Jalasinghadevi	46	15	37	48.7	39	51.3	76	3.1	5.0
6 Khorsane	38	13	34	44.7	42	55.3	76	3.1	5.8
7 Shivaratrighat	90	28	57	41.6	80	58.4	137	5.7	4.9
8 Barnebelayate	83	26	83	48.0	90	52.0	173	7.2	6.6
9 Tarebhir	94	30	89	54.9	73	45.0	162	6.7	5.4
10. Salleri	132	49	162	42.4	147	47.6	309	12.8	6.3
11 Salghari	49	19	65	48.1	70	51.9	135	5.8	7.1
12 Arunodaya	60	19	61	50.4	60	59.6	121	5.0	6.4
13. Rupadhari	61	19	57	47.1	64	52.9	121	5.0	6.4
14. Chhyangripasini	47	15	57	53.3	50	46.7	107	4.4	7.1
15. Chhabar	91	29	88	51.8	82	48.2	170	7.0	5.9
16. Bancharedanda	151	46	156	53.0	138	46.9	294	12.2	6.4
Grand Total	1227	399	1211	50.1	1205	49.9	2416	100	6.0

Source: Field Survey, 2003.

*Household

According to Table 5.1, Salleri and Bancharedanda CFUGs have the largest sample household (49 and 46) and population (309 and 294) followed by Arunganga, Tarevir and Chhabar community forest. Khorsane and Jalasinghadevi are smallest CF in which only 13 and 15 households were covered due to being a very small number of total households (43 and 46) participating in community forest. Total population of these

surveyed households appeared to be similar number. Similarly, only 15 numbers of households has been covered from the Chhyangripasini community forest from Charamwi VDC due to easy access to its adjoining nearest Chhabar and Bancharedanda community forest in Jarayotar VDC, however, the Chhyangripasini community forest has more households than this. These 15 households altogether have population numbers of 107.

According to Table 5.1, CF-wise total distribution of sample population by sex shows that female population is highest in Arunodaya (59.6 percent) followed by Oiputang (58.7 percent), Shivaratrighat (58.4 percent) and Khorsane (55.3) community forest with compared to its male population. Likewise, the male population is highest in Tarevir (54.9 percent) followed by Dakshinkali (53.8 percent), Chhyangripasini (53.3 percent), Arranging (53.1 percent) and Bancharedanda (53.0 percent) community forest with compared to its female population. Rests of the community forests have more or less similar trends about the distribution of male and female population in the study area.

5.1.2 Population Distribution by Caste/Ethnic Groups

As the Hindu caste structure is the basis of the rural social structure, the high caste Hindu groups (*Bramhin/Chhetri*) consider themselves culturally superior to other groups, especially the *Dalit* groups (*Kami, Damai, Gaine and Sarki*) who are placed at the bottom of the Hindu caste hierarchy. Other groups such as *Janajati* (*Rai, Magar, Limbu, Gurung, Tamang, Serpa, Bhujel and Majhi*) and *Newar* occupy the middle position between the two *Bramhin/Chhetri* and *Dalit* caste groups. The so called high caste *Bramhin/Chhetri* is generally big landowners, is better educated, and plays a key role in local politics. Most *Janajati* and *Dalit* households are dependent economically to the high cast as they provide loans and other supports when need arises. The occupational and so called low caste groups provide services to *Bramhin/Chhetri* and *Janajati* groups under the traditional *Bali* system. For this, these groups are provided with grain on an annual contract basis.

The details of distribution of sample population by caste/ethnic group and sex at the more disaggregated level for the whole study area are given in the Annex Table 5-A. If we look the each CF at the more disaggregated level, the Arunganga and the Panchakanya CF have more male than female population of *Newar* community which looks a sharp contrast as just discussed above that numerically, in an average, the *Newar* females are more than *Newar* males in the study area. Table 5.2 shows the composition of sample population by caste/ethnic groups and sex in study area.

Table 5.2

Composition of Sample Population by Caste/Ethnic and Sex in Study Area

Caste/Ethnic Groups	Sex						
	Male	Percent	Female	Percent	Total	Percent	Sex Ratio
Dalit	129	48.7	136	51.3	265	11.0	1.0
Janajati	465	51.3	442	48.7	907	37.5	0.9
Newar	135	47.7	148	52.3	283	11.7	1.1
Bramhin/Chhetri	482	50.2	479	49.8	961	39.8	0.9
Grand Total	1,211	50.1	1,205	49.9	2,416	100.0	0.9

Source: Field Survey, 2003.

According to Table 5.2, in an average, contrary to the numerical dominance of *Newar* females 148 (52.3 percent) than the *Newar* males 135 (47.7 percent) followed by the *Dalit* group of females 136 (51.3 percent) than the males 129 (48.7 percent), the *Janajati* community has more male 465 (51.3 percent) than female population 442 (48.7 percent). The distribution of male and female population within the combined *Brahmin* and *Chhetri* community the percentage distribution between them is not so significantly different, i.e. 50.1 percent of male and 49.9 percent of female population. Out of the total sample population 2,416, *Bramhin /Chhetri* constitute 39.8 percent followed by *Janajati* (37.5 percent), *Newar* (11.7 percent) and *Dalit* (11.0 percent) respectively. Male population of *Dalit* (48.7 percent) and *Newar* (47.7 percent) are comparatively less than *Bramhin/Chhetri* (50.2 percent) and *Janajati* (51.3 percent) respectively. Similarly, the female population of *Janajati* (48.7 percent) and *Brahmin/Chhetri* (49.8 percent) are comparatively less than *Dalit* (51.3 percent) and *Newar* (52.3 percent) respectively. The reason behind the low number of male population of *Dalit* and *Newar* were observed due to migration in different part of the country and aboard for job. Table 5.3 describes the composition of sample population by age group and caste in the study area.

Table 5.3

Composition of Population by Caste/Ethnic and Age Group in the Study Area

Age Groups

Cast/Ethnic groups	Below five	6-10	11-14	15-59	60 +	Total
Dalit	34.0	52.0	39.0	122.0	18.0	265.0
% Within Cast group	12.8	19.6	14.7	46.0	6.8	100.0
Janajati	84.0	121.0	103.0	537.0	62.0	907.0
% Within Cast group	9.3	13.3	11.4	59.2	6.8	100.0
Newar	35.0	35.0	30.0	163.0	20.0	283.0
% Within Cast group	12.4	12.4	10.6	57.6	7.1	100.0
Brahmin/Chhetri	98.0	101.0	114.0	569.0	79.0	961.0
% Within Cast group	10.2	10.5	11.9	59.2	8.2	100.0
Total	251	309.0	286.0	1,391.0	179.0	2,416.0
% Within Cast group	10.4	12.8	11.8	57.6	7.4	100.0

Source: Field Survey, 2003.

According to Table 5.3, *Dalit* and *Newar* households have higher percentage of below five populations (12.8 percent and 12.4 percent) than *Brahmin/Chhetri* and *Janajati* households (10.2 percent and 9.3 percent). Similarly, population between 6-10 years age is high for *Dalit* (19.6 percent) and it is low for *Brahmin/Chhetri* households (10.5 percent). Population between 11-14 years age is also high for *Dalit* (14.7 percent) and it is low for *Newar* households (10.6 percent). Population between 15-59 years age is high for *Brahmin/Chhetri* and *Janajati* households (59.2 percent) and it is low for *Dalit* households (46.0 percent). Population above 60 years age is high for *Brahmin/Chhetri* and *Janajati* households (8.2 percent) and it is low for *Dalit* households (6.8 percent).

5.1.3 Population Distribution by Income Groups

Table 5.4 portrays the economic heterogeneous nature of the forest dependent rural population and households in three ways–the relative distribution of total population among the three wealth-ranked groups in the study area, the relative distribution of poor people within each CFUG and between CFUGs and the absolute distribution of poor people in the whole study area.

The Annex Table 5-B reveals in details about the distribution of total sample population by income groups and sex of each CFUG at the more disaggregated level as well as at the aggregate level for the whole study area. Looking into the 16 CFUGs at an aggregate level, the whole study area has 2,416 populations. The total population under the middle-income group of households that is below the rich income group and the above the poor income group has significant number 903 (37.4 percent). Total population from rich income group and poor income group is similar 757 (31.3 percent) and 756 (31.3 percent) and exceeding by only one for rich income group than that of the poor income group.

Looking into the whole study area by CFUG at a more disaggregated level in Annex Table 5-B, poverty is much prone within the Oiputang CFUG 72 (52.2 percent) followed by Chabar CFUG 65 (38.23percent), Salleri CFUG 116 (37.54 percent), Arunganga FUG 70 (36.45 percent), Khorsane CFUG 27 (35.5 percent, Panchakanya CFUG 34 (35.3 percent), Dakshinkali CFUG 36 (34.0 percent) and Banchharedanda CFUG 96 (32.6 percent) respectively. Poverty is less prone within the Jalashingha Devi CFUG 14 (18.4 percent) followed by Barne Belayate 36 (20.8 percent), Arunodaya 26 (21.9 percent), Salghari CFUG 36 (26.7 percent) and Rupadhari CFUG 36 (29.7 percent) respectively. Poverty varies from minimum18.4 percent to the maximum 52.2 percent within the 16 CFUGs. Rest of the CFUGs - Shiva Ratri Ghat CFUG 42 (30.6 percent) and Tarevir CFUG 49 (30.2 percent) have moderate poverty scenario. The Chhyangripasini is only one poverty less CFUG where poor people were not identified during the PRA discussion held in the study area.

Looking into the aggregate level, out of total 2,416 sample population, 756 are the total poor people living in the whole study area. It is 31.3 percent of the total population. The Annex Table 5-B also shows the distribution of total poor people in the whole study area including all the 16 CFUGs at the aggregate level. Out of total poor people, more poor people are living in Salleri CFUG 116 (15.3 percent) followed by Oiputang 72 (9.5 percent) and Arunganga 70 (9.2 percent). Less poor people are living in Jalasingha Devi CFUG 14 (1.8 percent) followed by Arunodaya CFUG 26 (3.4 percent) and Khorsane CFUG 27 (3.6 percent) respectively. At the aggregate level in absolute term, distribution of poor people varies from minimum 1.8 percent to the maximum 15.3 percent in the study area.

Table 5.4 presents the aggregate composition of sample population by sex and income group in study area. Contrary to the numerical dominance of middle-income household's population, the ratio of rich household's females to its male is high (1.1) with the total females number of 397 (52.4 percent) and total males number of 360 (47.5 percent)

followed by the sex ratio of 0.9 of middle income households with the total females number of 444 (49.2 percent) than its males 459 (50.8 percent). The poor households have more male 392 (52.0 percent) than female population 364 (48.0 percent). The sex ratio for the poor income group is 0.9. The distribution of male and female population within the three wealth-ranked groups indicates that in an average, rich income households have dominated by female and the poor income households have dominated by the male population followed by the middle-income households.

Table 5.4

Composition of Sample Population by Sex and Income Group in Study Area

Income Groups	Sex						
	Male	Percent	Female	Percent	Total	Percent	Sex Ratio
Rich	360	47.6	397	52.4	757	31.3	1.1
Medium	459	50.8	444	49.2	903	37.4	0.9
Poor	392	51.8	364	48.1	756	31.3	0.9
Grand Total	1,211	50.1	1,205	49.9	2,416	100.0	1.0

Source: Field Survey, 2003.

Table 5.4 illustrates that out of the total sample population 2,416, Middle Income Group of households constitutes 37.4 percent followed by Rich Income Group of households (31.3 percent) and Poor Income Group of households (31.3 percent) respectively. Male population of Rich households (47.6 percent) is less than the female population (52.4 percent). Male population of Poor Income Group of households is comparatively highest (51.8) than the Middle (50.8 percent) and Rich Income Group of households. Similarly, the female population of Rich households is highest (52.4 percent) followed by Middle Income Group and Poor Income Group of households (49.2 percent) and (48.1 percent) respectively. The reasons behind the low number of male population of rich income group of households were observed due to Maoist pressure to have forced them to leave their home. Male population of poor and middle income groups of households are not living their home due to lack of out side working opportunities so males are higher than females in the study area.

Table 5.5 shows the distribution of sample population by age group and income group in the study area.

Table 5.5

Distribution of Sample Population by Age Group and Income Group

Income groups	Age groups										Total
	Below 5 Years	Percent	Between 6-14 yrs.	Percent	Below 15 Yrs.	Percent	Between 15-59 Yrs.	Percent	60 +	Percent	
Rich	64	8.4	150	19.8	214	28.2	461	60.9	82	10.8	757
Medium	92	10.2	213	23.6	305	33.8	533	59	65	7.2	903
Poor	95	12.5	232	30.7	422	55.8	397	52.5	32	4.2	756
Total	251	10.4	595	24.6	941	38.9	1391	57.8	179	7.4	2,416

Source: Field Survey, 2003.

Table 5.5 shows that the population of the study area is young. The proportion of total young people below 15 years of age in total population is high (38.9 percent) in the study area showing in a high child dependency ratio. Among the three income groups, the poor income group appears to have the relatively high and worst child dependency ratio compared to middle income and rich income groups.

The larger number of below five years age (preschooler child) in total population indicates a high child dependency ratio. In this regard, among the three-income group, the above table shows that poor income group has relatively high proportion of below five years age of preschooler child 95 to total population followed by the middle-income group 92 and the rich income group 64.

Among the three income groups, the proportion of young people below 15 years of age in total population is relatively high (55.8 percent) for the poor income group followed by middle income (33.8 percent) and rich income groups (28.2 percent) respectively. The poverty implications of such a high proportion of young people below 15 years of age in total population would prevent poor parents from sending their children to school, rather, they send them into the labour market as wage earners or put them to work in household affairs such as baby caring, livestock rearing, water fetching and firewood collection etc. Putting children to work instead of sending them to school may create a vicious circle: initially, work adversely affects schooling; later, little or no education perpetuates the practice of child labour (Thapa, et al., 1996).

Table 5.6 shows the dependent and independent population among the wealth rank groups of households in the study area. Independent population is considered as an economically active population and high proportion of such population to total household population ensures better earning opportunities of labour and vice versa. Similarly, dependent population is considered as an economically 1nactive population

and high proportion of such population to total household population leads the whole family to deprivation and destitution and vice versa.

Table 5.6

Economically Dependent and Independent Population by Income Group

Income groups	Dependent Population		Independent Population			
	Below 15 & Above 60 Years of Age	Percent	Between 15-59 Years Age	Percent	Total	Percent
Rich	296	39.1	461	60.9	757	31.3
Medium	370	41.0	533	59.0	903	37.4
Poor	359	47.5	397	52.5	756	31.3
Total	1,025	42.4	1,391	57.6	2,416	100.0

Source: Field Survey, 2003.

According to Table 5.6, the proportion of independent population of the rich income group is relatively high (60.9 percent) than proportion of dependent population (39.1percent) of its total population followed by the middle income (59.0 percent) and (41.0 percent) and poor income group (52.5 percent) and (47.5 percent) of their total population respectively. However, the proportion of dependent population is high for poor income group of households in comparison with middle income and rich income group of households. The poverty implications of such a high proportion of dependent population in their total household population is almost impossible for them to generate enough income to escape poverty and hence it would lead them further to vicious circle of poverty.

5.1.4 Educational Status of Sample Population

Study area is one of the least developed parts of the Arun river valley in eastern hills of Nepal. Proportion of illiterate population by CFUG clearly exemplifies this. Literacy can be expressed more meaningfully in terms of illiteracy percentage than literacy percentage. Illiteracy status is one of the indications of social and economic backwardness among population. Higher illiteracy among population also reflects poor quality of life. The discussion of educational status of sample households in the study area is based on eight indicators namely, illiteracy, literacy, primary level, secondary level, higher secondary level, graduate level and post-graduate level. A person who cannot read and write any languages is defined as illiterate. Similarly, a person who can read and write with simple arithmetical computation in any languages is defined as literate. Details of educational status of sample population of 16 CFUGs by illiteracy, literacy and level of educational attainment in the study area is presented in the Annex Table 5-C. Table 5.7 presents the educational status of sample population in the study area.

Table 5.7

Out of the total population 2,416, total illiterate people (6 years age and above) are comparatively high as 590 (24.4 percent of total population) than literate people (6 years age and above) 506 (20.9 percent) in the whole study area. People of secondary level of educational attainment are slightly higher 500 (20.7 percent) than People of primary level of educational attainment 471 (19.5 percent). On the other hand, the table clearly shows the decreasing trends of higher secondary level of educational attainment, graduate level of educational attainment and postgraduate level of education-received people 67 (2.8 percent), 25 (1.0 percent) and 6 (0.2 percent) respectively at each successive level of educational attainment.

Illiteracy of 6 years age and above among the CFUGs, Table 5.7 shows that the Salleri CFUG has more number of illiterate people 76 (12.9 percent of total number of illiterate people 590) followed by the Bancharedanda 64 (10.8 percent), Shivaratrighat 54 (9.1 percent), Arunganga 52 (8.8 percent), Oiputang 48 (8.1 percent), Tarebhir 39 (6.6 percent), and Barnebelayate, Salghari and Chhabar CFUG with similar number of illiterate number of people 37 (6.3 percent of total illiterate population). Similarly, among the CFUGs, the Chhyangripasini CFUG has less number of illiterate people 11 (1.9 percent of total number illiterate people) followed by Jalasinghadevi 17 (2.9 percent), Rupadhari 18 (3.0 percent), Dakshinkali 23 (3.9 percent), Arunodaya 24 (4.1 percent), Khorsane 25 (4.2 percent), and Panchakanya 28 (4.7 percent) respectively.

While, illiteracy in terms of percentage within the CFUG at a more disaggregated level, the Shivaratrighat CFUG has more percentage of illiterate people (39.4 percent of total number of population 137) followed by the Oiputang (34.8 percent), Khorsane (32.9 percent), Panchakanya (28,4 percent), Arunganga (27.1 percent), Salleri (24.6 percent), Tarevir (24.1 percent) and Jalasinghadevi (22.4 percent) respectively. Similarly, within the CFUG the Chhyangripasini CFUG has less percentage of illiterate people (10.3 percent of total number of population 107) followed by Rupadhari (14.9 percent), Arunodaya (19.8 percent) and Dakshinkali, Barnebelayate, Chhabar and Bancharedanda CFUFs have similar percent of illiterate people (from 21.4 percent to 21.8 percent) respectively.

Similarly, Table 5.7 shows the literacy status between CFUGs and within CFUG of sample population. Among the CFUGs the Salleri CFUG has more literate people 74 (14.6 percent of total literate population 506) followed by Bancharedanda 63 (12.4 percent), Arunganga 49 (9.7 percent), Tare Bhir 49 (9.7 percent), Barnebelayate 43 (8.5 percent), Chhabar 39 (7.7 percent), Arunodaya 28 (5.5 percent) and Salghari 27 (5.3 percent) respectively. Similarly, Among the CFUGs the Khorsane CFUG has less literate people 9 (1.8 percent of total number of literate population 506) followed by

Chhyangripasini 13 (2.6 percent), Panchakanya 15 (3.0 percent) Jalasinghadevi, 17 (3.3 percent), Dakshinkali and Oiputang 18 (3.5 percent) and Rupadhari 19 (3.7 percent) respectively.

While, literacy in terms of percentage within the CFUGs at a more disaggregated level, the Tarebhir CFUG has more literate people (34.3 percent) followed by Arunganga (25, 5 percent), Barnebelayate (24.8 percent), Salleri (23.9 percent), Arunodaya (23.1 percent), Chhabar (22.9 percent), Jalasinghadevi (22.4 percent) and Bancharedanda (21.4 percent) respectively. Similarly, within the CFUG the Khorsane CFUG has less percentage of literate people (11.8 percent) followed by Chhyangripasini (12.1 percent), Oiputang (13.0 percent), Panchakanya (15.1 percent), Rupadhari (15.7 percent), Dakshinkali (17.0 percent) Shivaratrighat (18.2 percent) and Salghari (20.0 percent) respectively.

Within the CFUGs, six CFUGs - Tarebhir, Barnebelayate, Arunodaya, Chhyangripasini, Rupadhari and Chhabar have comparatively more percentage of literate people than illiterate people do. Two CFUGs – Jalasinghadevi and Bancharedanda have similar percentage of illiterate and literate population. Rests of the CFUGs have more illiterate people than literate people.

The total number of people with primary educational attainment and the secondary level of educational attainment is not so different 471 (19.5 percent) and 500 (20.7 percent) respectively. Among the CFUGs the Bancharedanda, Salleri, Chhabar, Tarebhir, Arunganga, Oiputang and Rupadhari CFUGs have more number of primary education (1–5 grade) received people from 63 to 33 (13.4 percent to 7.0 percent of total primary education received people 471. Similarly, the less number of primary education received people is 10 in Shivaratrighat and number 29 in Dakshinkali. The percentage of primary education received people varies from 2.1 percent to 6.1 percent of the total primary education received people in the whole study area. On the other hand, so far higher secondary level is concerned, a very few people 67 (2.8 percent) have received higher secondary education. Out of 67 numbers of higher secondary received people, the Chhyangripasini has more number (7) compared to Oiputang, which has lowest number (1). Similarly, Out of 25 total numbers of graduate level education received people, Chhyangripasini has more number (8) followed by Shivaratrighat (4), Bancharedanda (30) The Arunganga, Arunodaya and Jalashingha Devi CFUGs have equal number (2). The Panchakanya, Dakshinkali, Tarevir and Rupadhari CFUG have lowest and equal number (1). Rests of the CFUG have no any number of graduate level education received people. Out of 6 total numbers of postgraduate level education received people in the whole study area, Chhyangripasini has more number (2). The Jalashingha Devi,

Rupadhari, Chhabar and Shivaratrighat CFUGs have lowest and equal number (1). Rests of the FUG have no any number of postgraduate education received people. The Table 5.7 also shows that out of total numbers of children (population below 5 years age) 251 (10.4 percent of total population) in the whole study area, The Bancharedanda CFUG has highest number (36) followed by Salleri (35), Barnebelayate (26) Arunganga (21) respectively. The Arunodaya and Rupadhari CFUGs have equal number (17). Similarly The Jalasinghadevi CFUG has lowest number (5) followed by Chhabar (7). Shivaratrighat Tarevir and Khorsane CFUGs have equal number (8). The Panchyakanya and Chhyangripasini CFUGs have equal number (10). Similarly, the Dakshinkali and Oiputang have equal number (14) followed by Salghari (15) respectively.Table 5.7 also reveals the fact that the education above the S.L.C. level for the poor people is not only a too far but also starlight to them.

Table 5.8 presents the educational status of sample population by caste/ethnic groups and level of educational attainment in the study area.

Table 5.8

Educational Status of Sample Population by Caste/Ethnic Group and Level of Educational Attainment in the Study Area

Caste/Ethnic Groups

Educational Status	*Dalit*	*Janajati*	*Newar*	*Brahmin/Chhetri*	Total
Illiteracy	92	233	72	193	590
% Within Cast group	34.7	25.7	25.4	20.1	24.4
Literacy	45	186	64	211	506
% Within Cast group	17.0	20.0	22.0	22.0	20.9
Primary Level	74	194	55	148	471
% Within Cast group	27.9	21.4	19.4	15.4	19.5
Secondary Level	20	183	50	247	500
% Within Cast group	7.5	20.2	17.7	25.7	20.7
Higher secondary	0	19	5	43	67
% Within Cast group	0.0	2.1	.8	4.5	2.8
Graduate	0	6	2	17	25
% Within Cast group	0.0	0.7	0.7	1.8	1.0
Post graduate	0	2	0	4	6
% Within Cast group	0.0	0.2	0.0	0.4	0.2
Below five years	34	84	35	98	251
% Within Cast group	12.8	9.3	12.4	10.2	10.4
Total	265	907	283	961	2416

Source: Field Survey, 2003.

According to Table 5.8, out of total population 2,416, total illiterate people (6 years age and above) are comparatively high as 590 (24.4 percent of total population) than literate people (6 years age and above) 506 (20.9 percent) in the whole study area. Primary level of education received people are 471 (19.5 percent) followed by the secondary level of education received people 500 (20.7 percent), higher secondary level of education received people 67 (2.8 percent), graduate level of education received people 25 (1.0 percent) and post graduate level of education received people 6 (0.2 percent) respectively.

Within the caste group, *Dalit* group has more illiterate people (34.7 percent) than literate people (17 percent). So far, the level of formal educational attainment is concerned; primary level of education-received people is higher (27.9 percent) than the secondary level of education received people (7.5 percent). On the other hand, they do not have any higher secondary, graduate and postgraduate level of education received people as well. Table 5.8 supports the general believes that there is sharp caste/ethnic gap in further successive level of educational attainment for marginalized group compared to dominant caste groups in the society. Within the *Brahmin/Chhetri* community, the illiterate people are less (20.1 percent) than literate people (22.0 percent). In other words, literacy is better than illiteracy in the *Brahmin/Chhetri* households. Similarly, the secondary level of education-received people is higher (25.7 percent) than the primary level of education-received people (15.4 percent). Table 5.8 shows clearly that the number of education-received people at each successive level of educational attainment is decreasing such as higher secondary education (43), graduate education (17) and postgraduate education (4.).

Within the *Janajati* and *Newar* groups, both have higher illiteracy (25.7 percent and 25.4 percent) than literacy (20.5 percent and 22.0 percent) respectively. Likewise, both have decreasing trends of the level of educational attainment from primary level to graduate level households. There is no any postgraduate educated member seen in the *Newar* families.

Higher percentage of below five years age children to total population within caste group indicates that population dependency ratio is high. Such a high share of economically inactive members to total household population, especially for lower caste/ethnic and economically poor income groups, may likely deprived and may lead into human poverty

and income poverty as well. Table 5.8 shows that among the caste/ethnic group, *Dalit* has higher percentage (12.8) of such below five years age children to total population followed by *Newar* (12.4 percent), *Brahmin/Chhetri* (10.2 percent) and *Janajati* (9.3 percent) respectively.

Table 5.9 shows the educational status of sample population by sex and educational attainment in the study area.

Table 5.9

Educational Status of Sample Population by Educational Attainment and Sex

Educational Status	Sex		
	Male	Female	Total
Illiteracy	172	418	590
Percent	7.1	17.3	24.4
Literacy	310	196	506
Percent	12.8	8.1	20.9
Primary	231	240	471
Percent	9.6	9.9	19.5
Secondary	295	205	500
Percent	12.2	8.5	20.7
Higher secondary	49	18	67
Percent	2.0	0.7	2.8
Graduate	21	4	25
Percent	0.9	0.2	1.0
Post graduate	5	1	6
Percent	0.2	0.0	0.2
Below five years	128	123	251
Percent	5.3	5.1	10.4
Total	1,211	1,205	2,416
Percent	50.1	49.9	100.0

Source: Field Survey, 2003.

According to Table 5.9, out of the total population 2,416, total illiterate people (6 years age and above) are high as 590 (24.4 percent) in the whole study area than the total literate people 506 (20.9 percent). The total primary educational attainment and the secondary level of educational attainment people are not so different 471 (19.5 percent)

and 500 (20.7 percent) respectively. On the other hand, so far higher secondary level of educational attainment is concerned, a very few people 67 (2.8 percent) from the dominant caste/ethnic group (*Brahmin/Chhetri, Janajati* and *Newar*) have received this educational attainment. People having graduate level of educational attainment and post-graduate educational attainment is negligible 25 (1.0 percent) and (0.2 percent) respectively in the whole study area. Table 5.9 also shows the numbers of children (population below 5 years age) are 251 (10.4 percent of total population). This indicates that the access of education above the S.L.C. level for the poor people and for the lower caste is not only a too far but also inaccessible to them.

Table 5.10 presents the educational status of sample population by income groups and level of educational attainment in the study area.

Table 5.10
Educational Status of Sample Population by Income Groups and Level of Educational Attainment in the Study Area

Educational Status	Wealth rank group			Total
	Rich	Medium	Poor	
Illiteracy	151	203	236	590
% Within Wealth rank group	19.9	22.5	31.2	24.4
Literacy	179	194	133	506
% Within Wealth rank group	23.6	21.5	17.6	20.9
Primary	108	170	193	471
% Within Wealth rank group	14.3	18.8	25.5	19.5
Secondary	196	212	92	500
% Within Wealth rank group	25.9	23.5	12.2	20.7
Higher Secondary	41	20	6	67
% Within Wealth rank group	5.4	2.2	0.8	2.8
Graduate	15	9	1	25
% Within Wealth rank group	2.0	1.0	0.1	1.0
Post Graduate	3	3	0	6
% Within Wealth rank group	0.4	0.3	0.0	0.2
Below five years	64	92	95	251
% Within Wealth rank group	8.5	10.2	12.6	10.4
Total	757	903	756	2,416

Source: Field Survey, 2003.

Table 5.10 shows that out of total population 757 from the rich income group, it has lowest illiterate people of six years age and above 151 (21.8 percent) than literate people

of six years age and above 179 (25.8 percent) excluding the number of below five years age population 64 (8.5 percent) within and among the wealth-ranked groups in the study area. Contrary to this, poor income group has highest illiterate people 236 (35.7 percent) than literate people133 (20.1 percent) excluding the number of below five years age population 95 (12.6 percent) out of total population 756 within and among the wealth-ranked groups. The middle-income group has one percent difference between illiterate and literate people; however, illiterate people are more 203 (25.0 percent) than literate people 194 (24.0 percent) excluding the number of below five years age child 92 (10.2 percent) out of total population 903.

The larger number of below five years aged children in total population indicates a high child dependency ratio. In this regard, among the three-income group, Table 5.10 shows that poor income group has relatively high proportion of below five years age of preschooler child 95 to total population followed by the middle-income group 92 and the rich income group 64.

On the other hand, Table 5.10 shows that the proportion of young people below 15 years of age in total population is relatively high for the poor income group compared to other wealth- ranked groups. The poverty implications of such a high proportion of young people below 15 years of age in total population would prevent Poor parents from sending their children to school, rather, they send them into the labour market as wage earners or put them to work in household affairs such as baby caring, livestock rearing, water fetching and firewood collection etc. Putting children to work instead of sending them to school may create a vicious circle: initially, work adversely affects schooling; later, little or no education perpetuates the practice of child labour (Thapa, et al., 1996).

Likewise, within the rich income group the level of secondary educational attainment is higher 196 than the level of primary educational attainment 108. Middle-income group has also same trend regarding the level of primary and secondary educational attainment. It has more secondary education-received people 212 than primary education-received people 170. On the contrary, the poor income group has more primary education-received people 193 than secondary education-received people 92 do. Table 5.10 shows clearly that beyond the secondary level, there is a decreasing trend of higher secondary, graduate and postgraduate educated people at each successive level of educational attainment. However, the poor income group appears to have the worst economic discrimination in higher education including higher secondary, graduate and postgraduate level of education. Table 5.10 suggests that in a socio-economic heterogeneous society like ours, the socio-economic class gap in education widens further at each successive level of educational attainment for lower caste and poor in

particular and for dominant ethnic groups and non-poor in general. So that it is more prevalent in poor income group (higher secondary 6, graduate 1 and postgraduate 0) level of educational attainment followed by middle- income (higher secondary 20, graduate 9 and postgraduate 3) and rich income group (higher secondary 41, graduate 15 and postgraduate 3) respectively.

The conclusion is that illiteracy and literacy condition including the level of educational attainment of the people, which are an indicator of educational development, varies not only from CFUG to CFUG but it varies from caste group to caste group and wealth-ranked group to wealth- ranked group in the study area. Gender discrimination in literacy is apparent everywhere in the study area. Among the sixteen CFUGs, each CFUG has higher number of illiterate female than male. The gender gap in education widens further at each successive level of educational attainment, which is shown in detail in Annex Table 5-C. Mass illiteracy creates a huge productivity gap between the educated few (elite) and the illiterates. Such a gap persists in the areas of income earning and opportunity sharing (Chhetri, 2001). In this regard, a notable author said that the social opportunities offered by market-based economic growth, particularly of integration with modern world markets, are severely limited when a large part of the community cannot read, write, or count, cannot follow printed or hand written instructions, cannot cope easily with contemporary technology, and so on (Sen, 1996) .

5.2 Economic Characteristics of the Study Area

5.2.1 Landholding

Land is a major subsistence economic resource for rural population. It is believed that larger size of land ownership offers household economic security as well as high political and social prestige in the society. Size of livestock holding also depends on size of land holding among the different castes and wealth-ranked groups. Thus, those households who have occupied more land may likely to have greater size of livestock holding too and hence more needs of agricultural and livestock related forest products harvesting from community forest. Thus, in rural Nepal use of common property forest resource has a strong linked to the size of land holdings and livestock holdings. Traditionally, it is apparent that most of the Nepalese households have a strong stimulating connection to land in Nepal.

Details of land holding by caste group and wealth-ranked group of each CFUG is presented in the Annex Table 5-D and 5-E. The Annex Table 5-D portrays that out of 16 CFUGs, three CFUGs- Barnebelayate, Khorsane and Rupadhari have average land holding less than one hectare. Chhyangripasini CFUG has around three hectare of

average land holding. Rests of the other CFUGs have average land holding more than one hectare but less than two hectare.

5.2.1.1 Distribution of Total Land by Type, Area, Household and Size in the Study Area

Nepal has limited arable land due to uneven topographical structure. The average size of holding in the country is 0.96, which is very low in comparison to its neighboring SAARC countries. However, land is both valuable and productive economic resource for urban and rural inhabitants. Its possession offers economic value and security. A large landholding demonstrates a high political and social prestige among its owners. Economically too, the well being of livestock, an integral part of agrarian rural society, depends on the size of the landholding. Apart from this, there is a wide disparity in the distribution of both cultivated and non-cultivated land among the Nepalese households despite the introduction of Land Reform Act 1964 in Nepal. The land reform programs abolished intermediaries in the land revenue collection system, provided security of tenure for sharecroppers and tenants, and impose land ownership 'ceiling'. However, the redistribution of ‘ceiling–surplus' land from landlords to the land poor was only a marginally successful policy (Seddon, 1987). Moreover, the dual ownership of land always created a situation in which either tenants or owner was motivated to invest in land improvement (NESAC, 1998). In this regard, the rural credit survey (NRB, 1994) reports that investment in land improvement is less than 3.0 percent of household income. The dual ownership, however, was removed in 1996, with half of the ownership over tenancy land granted to the tenant.

Despite various land reform programmes in place since 1964, there is a wide disparity in the distribution of both cultivated and non-cultivated land among the households in rural Nepal. Tables 5.11 and 5.12 demonstrate the distribution of total land area by type, area, household and size in the study area. Out of 509.3 hectares of operated land in the study area, poor farmers having holdings of less than 0.5 hectare own only 30.8 hectares (6.0 percent) of all types of operated land while middle farmers having holdings of 0.5-2 hectare own 222.6 hectare (43.7 percent) of all types of operated land. The rich farmers having holdings more than 2 hectare own 255.9 hectare (50.3 percent) of all types of operated land. On the other hand, out of six types of operated land observed in the study area, the share of nonirrigeted land *(bari)* to total land is 56.8 percent operated by 96.2 percent among the land owner households followed by irrigated land *(khet)* 21.9 percent operated by 46.6 percent households, khoria land 6.4 percent operated by 14 percent households, wetland 4.7 percent operated by 35.1 percent households, house yard 1.8

percent operated by 99.2 percent households and grazing land 1.2 percent operated by 1.0 percent households.

Table 5.11

Total Land Area by Land Type and Land Size in the Study Area

Land Size	Irrigated		Nonirrigated		*Khoria*		House yard		Grazing		Wetland		Total Area
	Area	HHs	Area	HHs	Area	HHs	Area	HHs	Area	HHs	Area	HHs	
No Land	0	213	0	15	0	343	0	3	0	395	0	259	0
< 0. 5 hec	2.0	118	18	144	0.3	34	1.1	305	0.3	2	9.4	91	30.8
0.5-2 hec	40.7	61	160.7	217	9.4	21	5.4	91	0	1	6.4	31	222.6
> 2 hec	69.0	7	146.5	23	23.1	1	2.9	0	5.9	1	8.5	18	255.9
% of Total	111.7	186	325.2	384	32.8	56	9.5	396	5.9	4	24.2	140	509.3

Source: Field Survey, 2003.

Table 5.12

Percentage of Land Area and Households by Size and Types in the Study Area

Land Size	Irrigated		Nonirrigated		*Khoria*		House yard		Grazing		Wetland		Total Area
	Area	HHs	Area	HHs	Area	HHs	Area	HHs	Area	HHs	Area	HHs	
No Land	0	53.4	0	3.8	0	86.0	0	0.8	0	99.0	0	64.9	0
< 0. 5 hec	1.8	63.4	5.5	37.5	0.9	60.7	11.8	77.0	0.5	50.0	38.6	65.0	6.0
0.5-2 hec	36.4	32.8	49.4	56.5	28.7	37.5	57.1	23.0	0.0	25.0	26.3	22.1	43.7
> 2 hec	61.8	3.8	45.0	6.0	70.4	1.8	31.1	0.0	99.5	25.0	35.0	12.8	50.3
% of Total	21.9	46.6	56.8	96.2	6.4	14.0	1.8	99.2	1.16	1.0	4.7	35.1	

Source: Field Survey, 2003.

Tables 5.11 and 5.12 show that there is wide disparity in the distribution of irrigated land *(Khet)* among the households in the study area. Majority households 213 (53.4 percent) have no irrigated land. Among the land owners, relatively large number of households 118 (63.4 percent) having holdings of less than 0.5 hectare operates only 2 hectare (1.8 percent) of total irrigated land, where as 7 households (3.8 percent) having holdings of more than 2 hectare operates 69 hectare (61.8 percent) of total irrigated land. About 61 households (32.8 percent) having holdings of 0.5-2 hectare operates 40.7 hectare (36.4 percent) of total irrigated land.

Likewise, there is also a wide disparity in the distribution of non-irrigated land *(bari)* among the households in the study area. About 15 households (3.8 percent) have no non-irrigated land. Among the landowners, relatively large number of households 217 (56.5 percent) having holdings of 0.5-2 hectares operates 160.7 hectare (49.4 percent) of total non- irrigated land. Moderate number of households 144 (37.5 percent) having holdings of less than 0.5 hectare operate only 18 hectare (29.6 percent) of total non-irrigated land. On the other hand, a very small number of households 23 (6.0 percent) having holdings of more than 2 hectares operate 146.5 hectare (45.0 percent) of total non-irrigated land in the study area.

Khoria land is known as less productive land in rural area. Such type of land is mostly rented to the landless/marginal poor farmers by the large holdings rich farmers. According to above table most households 343 (86.0 percent) have no *khoria* land. Among the landowners, only one households (1.8 percent) having holdings of more than 2 hectare operates 23.1 hectare (70.4percent) of total *khoria* land and 21 households (37.5 percent) having holdings of 0.5-2 hectare operates 9.4 hectare (28.7 percent) of total *khoria* land. About 34 households (60.7 percent) having holdings of less than 0.5 hectare operates only 0.3 hectare (0.9 percent) of total *khoria* land.

Three homeless households have no house yard land. Majority households 305 (77.0 percent) having holdings of less than 0.5 hectare operates only 1.12 hectare (11.8 percent) of total house yard land while rest of the households having holdings of 0.5-2 hectare of house yard land. No single household found having holdings of more than 2 hectare of house yard land in the study area. Likewise, majority households have no grazing land and wetland (unproductive dessert land). The proportion of grazing land to total land is so small however, such type of land is mostly owned by rich farmers. On the other hand, poor farmers having holdings of less than 0.5 hectare mostly own wetland.

5.2.1.2 Landholding Size by Caste/Ethnic Groups

There is a wide disparity in the distribution of the cultivated and non-cultivated land among the caste groups in the study area. Tables 5.13a and 5.13b show the distribution of total cultivated and non-cultivated land among the different caste groups of households within the community forest user groups of the study area based on three far size category i.e. marginal farm size (< 0.5 hectare), small farm size (0.5-2 5 hectare) and large farm size (>2 hectare) in rural Nepal.

Table 5.13a

Farm Size Households by Caste/Ethnic Groups and Land Area

Farm Size

Caste/Ethnic Groups	Marginal (<0.5 hac)		Small (0.5-2 hac)		Large (>2 hac)		Total		Average Holding
	Area	HHs	Area	HHs	Area	HHs	Area	HHs	
Dalit	2.9	13	22.1	24	14.4	6	39.4	43	0.9
Janajati	9.2	32	92.1	98	71.7	26	173.1	156	1.1
Newar	1.7	7	29.3	29	16.6	6	47.7	42	1.1
Brahmin/Chhetri	7.6	27	84.1	75	157.4	56	249.1	158	1.6
Total	21.5	79	227.6	226	260.2	94	509.3	399	1.3

Source: Field Survey, 2003.

Table 5.13b

Percentage of Land Area and Farm Size Households by Caste/Ethnic Groups

Farm Size

Caste/EthnicGroups	Marginal (<0.5 hac)		Small (0.5-2 hac)		Large (>2 hac)		Total Av.	
	Area	HHs	Area	HHs	Area	HHs	Area	HHs
Dalit	13.5	30.2	9.7	55.8	5.5	13.9	7.7	10.8
Janajati	43.0	20.5	40.5	62.8	27.6	16.7	34.0	39.1
Newar	8.1	16.7	12.9	69.1	6.4	14.3	10.0	10.5
Brahmin/Chhetri	35.4	17.1	37.0	47.5	60.5	35.4	48.9	39.6
Total Av.	4.2	19.8	44.7	56.6	51.1	23.6	100.0	100.0

Source: Field Survey, 2003.

According to Tables 5.13a and 5.13b, out of total 43 low caste (*Dalit*) households (10.8 percent of total households) only 6 households (13.9 percent of total *Dalit* households) own more than two hectares of land, 24 households (55.8 percent of total *Dalit* households) own 0.5-2 hectares of land and 13 households (30.2 percent of total *Dalit* households) own less than 0.5 hectares of land with an average of 0.9 hectare of land for *Dalit* caste groups of households. Out of total 156 *Janajati* households, (39.1 percent of total households) 26 households (16.7 percent of total *Janajati* households) own more than two hectares of land, 98 households (62.8 percent of total *Janajati* households) own 0.5-2 hectares of land and 32 households (20.5 percent of total *Janajati* households) own less than 0.5 hectares of land with an average of 1.1 hectares. Similarly, out of total 42 *Newar* households (10 5 percent of total households) 6 households (14.3 percent of total

Newar households) own more than two hectares of land, 29 households (69.1 percent of total *Newar* households) own 0.5-2 hectares of land and 7 households (16.7 percent of total *Newar* households) own less than 0.5 hectares of land with an average of 1.1 hectares. Out of total 158 *Brahmin* and *Chhetri* households (39.6 percent of total households), 56 households (35.4 percent of total *Brahmin* and *Chhetri* households) own more than two hectares of land, 75 households (47.5 percent of total *Brahmin* and *Chhetri* households) own 0.5-2 hectares of land and 27 households (17.1 percent of total *Brahmin* and *Chhetri* households) own less than 0.5 hectares of land with an average of 1.6 hectares.

According to Table 5.13b, out of total 509.3 hectares of land and 399 households in the study area, 39.6 percent of *Brahmin/chhetri* caste group of households has highest area (49.0 percent) of the total land. About 39.1 percent of *Janajati* caste group of households has 34.0 percent of total land and about 10.5 percent of *Newar* caste group of households has 10.0 percent of total land. While 10.8 percent of *Dalit* caste group of households has lowest percent (7.7) of the total land.

5.2.1.3 Landholding Size by Income Groups

A large number of households in the study area have very small proportion of total land but a smaller number of households have a large proportion of the total land. The Tables 5.14a and 5.14b presented below show the distribution of land among the different income groups of households based on three-farm size category i.e. marginal farm size (< 0.5 hector), small farm size (0.5-2 5 hector) and large farm size (>2 hector) in rural Nepal.

Table 5.14a

Farm Size Households by Income Groups and Land Size in the Study Area

Farm Size

Income Groups	Marginal (<0.5 hac)		Small (0.5-2 hac)		Large (>2 hac)		Total		Average Holding
	Area	HHs	Area	HHs	Area	HHs	Area	HHs	
Rich	0.2	1	46.3	30	226.5	80	273.1	111	2.5
Medium	2.4	6	133.4	124	31.1	13	167.0	143	1.2
Poor	18.9	72	47.8	72	2.5	1	69.2	145	0.5
Total	21.5	79	227.6	226	260.2	94	509.3	399	1.3

Source: Field Survey, 2003.

Table 5.14b

Percentage of Land Area and Farm Size Households by Income Groups

Farm Size

Income Groups	Marginal (<0.5 hac)		Small (0.5-2hac)		Large (>2 hac)		Total Average	
	Area	HHs	Area	HHs	Area	HHs	Area	HHs
Rich	1.2	0.9	20.3	27.0	87.1	72.1	53.6	27.8
Medium	11.1	4.2	58.6	86.7	12.0	9.1	32.8	35.8
Poor	87.8	49.7	21.0	49.7	1.0	0.7	13.6	36.3
Total Av.	4.2	19.8	44.7	56.6	52.0	23.6	100.0	100.0

Source: Field Survey, 2003.

According to Tables 5.14a and 5.14b, out of 145 poor households (36.3 percent of total households), only one household (0.7 percent of total large farm household) owns more than two hectares of land (1.0 percent area of total large farm size). Equal number of small and marginal farmer households 72 (49.7 percent) own 0.5-2 hectares of land (21.0 percent of total small farm size) where as 72 marginal farmer households own less than 0.5 hectares (87.8 percent of total marginal farm size) of land with an average of 0.5 hectares for poor income households. Out of 143 middle-income households (35.8 percent of total households), 13 households (9.1 percent of total large farm household) own more than two hectares of land (12.0 percent area of total large farm size). Small farmer household's number of 124 (86.7 percent of total small farm households) own 0.5-2 hectares of land (58.6 percent of total small farm size) where as 6 households (4.2 percent of total marginal farm households) own less than 0.5 hectares of land (11.1 percent of total marginal farm size) with an average of 1.2 hectare for middle-income households. Similarly, out of 111 richer households (27.8 percent of total households), the most 80 households (72.1 percent of total large farm household) won more than two hectares of land, (87.1 percent area of total large farm size). Small farmer household's number of 30 households (27.0 percent of total small farm households) own 0.5-2 hectares of land (20.3 percent of total small farm size) where as and only one household (0.9 percent of total small farm household) owns less than 0.5 hectares of land (1.2 percent of total marginal farm size) with an average of 2.5 hectares.

5.2.2 Livestock holding

Animal husbandry is an integral part of the subsistence farming system in Nepal. Livestock is both valuable consumption and productive economic resource for rural

inhabitants. Its possession offers economic value and security. A large landholding demonstrates a high political and social prestige among its owners. Economically too, the well being of agriculture, an integral part of agrarian rural society, depends on the size of the livestock holding. Size of land holding also depends on size of livestock holding among the different castes and wealth-ranked groups. Thus, those households who have occupied more livestock may likely to have greater size of land holding too and hence more needs of livestock and agricultural related forest products harvesting from community forest. Thus, in rural Nepal use of common property forest resource has a strong linked to the size of livestock and land holdings. Traditionally, it is apparent that most of the Nepalese households have a strong exciting tie to domestic cattle in Nepal.

There is a wide disparity in the ownership of different types of livestock holding among the rural households in Arun River Valley. Cow, Ox, Buffalo, goat and pig were observed as the common domestic animals in the study area. Pigs and chickens are generally found in the lower cast households. Each household within different cast and wealth-ranked groups has some local breed domestic cattle with low productivity. Leather, Ghee, curd, meat and milk are the main direct consumption products of livestock. Agricultural inputs are the indirect means of livestock such as ox and animal nutrients. Generally, the number of livestock holding per household is low in lower caste and poor income group. The following table shows that there is wide disparity in the ownership of different types of cattle among the caste groups of households in the study area.

5.2.2.1 Livestock holding by Caste/Ethnic Groups

Table 5.15 presents the different types of livestock holding by different caste/ethnic groups of households in the study area. Details of livestock holding by caste group and income group of each CFUG are presented in the Annex Tables 5-and 5-G. out of total 5,075 livestock and 399 households in the study area, the *Brahmin/Chhetri* caste group has highest average per household livestock holding (15.4) followed by *Newar* (11.7), *Janajati* (11.4) and low caste (*Dalit*) 8.6 respectively.

Table 5.15

Livestock holding by Types and Caste/Ethnic Groups

Caste/Ethnic Groups

Types of Livestock	*Dalit* (N= 43)		*Janajati* (N=156)		*Newar* (N=42)		*Brahmin/Chhetri* (N=158)		Total (N=399)	
	Total	P/H	Total	P/H	Total	P/H	Total	P/H	Total	P/H
Cows/Oxes	124	2.9	643	4.1	174	4.1	683	4.3	1624	4.1
Buffalos	47	1.1	130	0.8	52	1.2	274	1.7	503	1.3
Goats	149	3.5	809	5.2	257	6.1	1436	9.1	2651	6.6
Pigs	50	1.2	192	1.2	9	0.2	45	0.3	296	0.7
Horse	0	0.0	0	0.0	1	0.0	0	0.0	1	0.0
Total	370	8.6	1774	11.4	493	11.7	2438	15.4	5075	12.7

Source: Field Survey, 2003.

Table 5.15 illustrates that among the livestock, average per household holdings of goat is highest (6.6) followed by cow/ox (4.1), Buffalo (1.3) and pig (0.7). Pigs are typically found in the *Newar* and *Brahmin/Chhetri* households also. This indicates that the thinking of rural economic activities is shifting based on incentive rather than caste based values. The total average livestock holding per household is 12.7.

Table 5.15 demonstrates that high caste households have larger size of all types of livestock than the low caste (*Dalit*) households. The implications of such unequal livestock ownership based on caste groups may have likely the possibility of unequal use of local common forest resources. Household members with bigger land ownership and livestock holding (or less poor households) are expected to benefit proportionally more from community forest because the management regime of community forest is mainly oriented to the production of intermediate products that serve as inputs in the farming system (Richards et al., 1999). Wealthier households with larger herds and more lands have greater need for animal fodder and agriculture compost (Varughese, 1999), which, in turn, results in inequitable use of the community resource base.

5.2.2.2 Livestock holding by Income Groups

Table 5.16 shows that there is wide disparity in the ownership of different types of cattle among the income groups of households in the study area.

Table 5.16

Livestock holding by Types and Income Groups

Income Groups

Types of Livestock	Rich (N= 111)		Medium (N= 143)		Poor (N= 145)		Total (N= 399)	
	Total	P/H	Total	P/H	Total	P/H	Total	P/H
Cows/Oxes	600	5.4	596	4.2	428	3.0	1624	4.1
Buffalos	217	2.0	197	1.4	89	0.6	503	1.3
Goats	1232	11.1	886	6.2	533	3.7	2651	6.6
Pigs	72	0.6	132	0.9	92	0.6	296	0.7
Horse	1	0.0	0	0.0	0	0.0	1	0.0
Total	2121	19.1	1811	12.7	1143	7.9	5075	12.7

Source: Field Survey, 2003.

According to Table 5.16, out of total 5075 numbers of livestock and 399 households in the study area, the wealthier households have highest average per household livestock holding (19.1) followed by middle income households (12.7) and poor income households (7.9) with total average of 12.7 respectively. Among the types of livestock, average per household holdings of goat is highest (11.1) followed by cow/ox (5.4), Buffalo (2.0) and pig (0.9).

Table 5.16 illustrates that rich households have larger size of all types of livestock holdings than the middle income and poor income households. Again, the implications of such unequal livestock ownership based on wealth–ranked groups may have likely the unequal use of local common forest resources. Household members with bigger land ownership and livestock holding (or less poor households) are expected to benefit proportionally more from community forest because the management regime of community forest is mainly oriented to the production of intermediate products that serve as inputs in the farming system (Richards *et al.,* 1999). Wealthier households with larger herds and more lands have greater need for animal fodder and agriculture compost (Varughese, 1999), which, in turn, results in inequitable use of the community resource base.

5.2.3 Food Sufficiency

Food is a key element among the basic needs of survival. The major sources of food come from different types of agricultural grains in rural Nepal. However, Majority of rural households could not fulfill their food requirement by their own production. Inadequacy of food consumption is considered as subjective poverty, which is difficult to measure due to subjective judgment of the respondents. However, an attempt has been made here to distinguish the degree of food sufficiency into three groups such as "sufficient", "deficit" and "surplus". Details of food sufficiency situation for different caste group and income group of each CFUG is presented in the Annex Tables 5-H and 5-I.

The findings on food sufficiency of the present study and the Nepal Living Standard Survey (NLSS) 2003/04 are contrarily different. According to NLSS 2003/04, on an average only 31 percent Nepalese households are facing food deficit problems, 67 percent households are able to fulfill their yearly food requirement by their own production and remaining 2 percent households are able to produce more than adequate surplus food grain. Contrary to this, the finding of the present study is that out of total sample households, majority of the households (53.6 percent) are unable to fulfill their food requirement by their own production. About 26.6 percent households are able to fulfill just to meet their yearly food requirement by their own production while only 19.8 percent households are able to produce more than adequate surplus food grain (see detail in Annex Tables 5-G and 5-H).

5.2.3.1 Food Sufficiency by Caste/Ethnic Groups

A large number of households from the *Dalit* caste group in the study area have food sufficiency less than adequate in comparison with *Brahmin/Chhetri*, *Newar* and *Janajati* caste/ethnic groups. Tables 5.17 and 5.18 show the food sufficiency situation among the different caste groups of households in terms of degree of food sufficiency and food deficit months that households are facing severe food deficit problems.

Table 5.17 shows the degree of food sufficiency situation of different caste groups of household in the study area. Among the caste groups, *Brahmin/Chhetry* has similar food sufficiency situation where as low caste *Dalit* has high food deficit situation followed by *Newar* and *Janajati* respectively.

Table 5.17

Degree of Food Sufficiency Households by Caste/Ethnic Groups

Degree of Food Sufficiency

Caste/Ethnic Groups	Sufficient		Deficit		Surplus		Total	
	HHs	%	HHs	%	HHs	%	HHs	%
Dalit	8	18.6	34	79.1	1	2.3	43	100.0
Janajati	37	23.7	99	63.5	20	12.8	156	100.0
Newar	10	23.8	27	64.3	5	11.9	42	100.0
Brahmin/Chhetri	51	32.3	54	34.2	53	33.5	158	100.0
Total and Av.	106	26.6	214	53.6	79	19.8	399	100.0

Source: Field Survey, 2003.

Table 5.17 presents the actual food situation of different caste groups of household. Within the caste group, a large proportion of *Dalit* households (79.1 percent of total *Dalit*) are facing food deficit problems and they could not fulfill their family food requirement by own food grain production followed by *Newar* (64.3 percent of total *Newar*) *Janajati* (63.5 percent of total *Janajati*) and *Brahmin/Chhetri* (34.2 percent of total *Brahmin/Chhetri*) respectively. The causes of over all food deficits are: high percentage of non-irrigated low quality land, lack of agricultural inputs, lack of crop diversification, lack of access to credit and market place etc. The probable causes of high food deficits in *Dalit*, *Newar* and *Janajati* household are: low quality land to produce food grain and diversion of significant proportion of food grain for the making of alcohol. Households of food situation at satisfactory and surplus level seem to be similar for *Newar* (23.8 percent and 11.9 percent) and *Janajati* (23.7 percent and 12.8 percent) respectively where as only one from *Dalit* community is food surplus household and 8 households are food sufficient households.

5.2.3.2 Food Deficit Households by Caste/Ethnic Groups

Table 5.18 shows that out of total sample households, majority of the households (53.6 percent) are unable to fulfill their food requirement by their own production. Among the 214 food deficit households (53.6 percent), 86 households (40.2 percent of total food deficit households) could fulfill their food grain requirement by their own production up to 3 month only followed by 36.4 percent for 3- 6 month, 20.1 percent for 6-9 month and only 3.3 percent for whole months of a year respectively. In other words, fewer months (3 month) is food deficit month for more 86 households and more months (12 month) is

food deficit month for fewer households. The total number of 78 households could fulfill their food requirement by their own production up to3- 6 month only.

Table 5.18

Food Deficit Households by Caste/Ethnic Group and Month

Months

Caste/Ethnic Groups	Less than 3 Month		3-6 Month		6-9 Month		12 Month		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Dalit	10	29.4	10	29.4	9	26.5	5	14.7	34	100.0
Janajati	39	39.4	39	39.4	19	19.2	2	2.0	99	100.0
Newar	12	44.4	11	40.7	4	14.8	0	0.0	27	100.0
Brahmin/Chhetri	25	46.3	18	33.3	11	20.4	0	0.0	54	100.0
Grand Total	86	40.2	78	36.4	43	20.1	7	3.3	214	100.0

Source: Field Survey, 2003

Table 5.18 shows that among caste groups, *Dalit* households are more food deprived for whole year compared to *Janajati* households where as *Brahmin/Chhetri* households are less food deprived for 3 months compared to other caste groups. *Janajati* households (39.4 percent) have food deficit month of less than 3 month and 3-6 month and *Newar* households (44.4 percent and 40.7 percent) of are suffering from food deficit problem for less than 3 month and 3-6 month respectively. There is no *Newar* and *Brahmin/Chhetri* household suffering from food deficit problem for whole year.

5.2.3.3 Food Sufficiency by Income Groups

Table 5.19 shows the degree of food sufficiency situation of different wealth-ranked groups of household in the study area. Among the wealth-ranked groups, high-income class has better food sufficiency situation followed by middle-income class where as low- income class has high food deficit situation in the study area.

Table 5.19 shows the degree of food sufficiency situation of different wealth-ranked groups of household in the study area. Among the wealth-ranked groups, more rich households (46.8 percent) have food surplus situation for one year by their own production in comparison with medium households (16.1 percent) and poor households (2.8 percent) with total average of 19.8 percent of food surplus households out of total households in the study area.

Table 5.19

Degree of Food Sufficiency Households by Income Class

Degree of Food Sufficiency

Income Class	Sufficient		Deficit		Surplus		Total	
	HHs	%	HHs	%	HHs	%	HHs	%
Rich	41	36.9	18	16.2	52	46.8	111	100.0
Medium	56	39.2	64	44.8	23	16.1	143	100.0
Poor	9	6.2	132	91.0	4	2.8	145	100.0
Total & Average	106	26.6	214	53.6	79	19.8	399	100.0

Source: Field Survey, 2003

Table 5.19 clearly indicates that majority of the poor income households (91.0 percent) have food deficit situation for one year by their own production in comparison with medium households (44.8 percent) and rich households (16.2 percent) with total average of 53.6 percent of food deficit households out of total households in the study area. Likewise, degree of food adequate households among the wealth-ranked groups, more medium households (39.2 percent) have food sufficiency situation for one year by their own production in comparison with rich households (36.9 percent) and poor households (6.2 percent) with total average of 26.6 percent of food sufficiency households out of total households in the study area.

5.2.3.4 Food Deficit Households by Income Groups

Table 5.20 shows that out of total sample households, majority of the households (53.6 percent) are unable to fulfill their food requirement by their own production. Among the 214 food deficit households (53.6 percent of total households), 86 households (40.2 percent of total food deficit households) are unable to fulfill their food grain requirement by their own production up to 3 month only. About 36.0 percent households are unable to fulfill their food grain requirement by their own production for 3-6 month. About 20.1 percent households are unable to fulfill their food grain requirement by their own production for 6-9 month and 3.3 percent households are unable to fulfill their food grain requirement by their own production for whole months of a year. In other words, fewer months (3 month) is food deficit month for more 86 households and more months (12 month) is food deficit month for fewer 7 households. The total 78 households could not fulfill their food requirement by their own production up to 3-6 month and 43 households are unable to fulfill their food requirement by their own production for 6-9 month.

Table 5.20

Food Deficit Households by Income Class and Month

Months

Income Class	Less than 3 Month		3-6 Month		6-9 Month		12 Month		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Rich	11	61.1	5	27.8	2	11.1	0	0.0	18	100.0
Medium	33	51.6	18	28.1	13	20.3	0	0.0	64	100.0
Poor	42	31.8	55	41.7	28	21.2	7	5.3	132	100.0
Grand Total	86	40.2	78	36.4	43	20.1	7	3.3	214	100.0

Source: Field Survey, 2003

Table 5.20 shows that among wealth-ranked groups, only the poor income households have food deprivation for whole year. More rich households (61.1 percent) have less month (less than 3 month) of food deprivation in comparison with medium (51.6 percent) and poor income households (31.8 percent) with an average of 40.2 percent households of food deficit for less than 3 month. Similarly, more poor (41.7 percent) and (21.2 percent) households have 3-6 month and 6-9 month of food deprivation. Medium (28.1 percent) and (13 percent) households have 3-6 month and 6-9 month of food deprivation. Rich income (27.8 percent) and (2.0 percent) households have 3-6 month and 6-9 month of food deprivation with an average of 36.4 percent for 3-6 month of food deficit and 20.1 percent for 6-9 month of food deficit households out of total households in the study area. The above table shows that there are more food inadequacy households (26.5 percent) for more than 6 month from the poor income group in comparison with (20.3 percent) and rich (11.1 percent) food inadequacy households from medium income and rich income group of households respectively in the study area. Similarly, among the less than 6-month of food inadequacy households, there are more rich households (88.9 percent) followed by medium (79.7 percent) and poor income households (73.5 percent) respectively in the study area. There is no any rich and medium household suffering from food deficit problem for the whole year in the study area.

The causes of over all food deficits for all the income classes are: high percentage of non-irrigated low quality land, lack of agricultural inputs, lack of crop diversification, lack of access to credit and market place etc. The probable causes of high food deficit months in poor income groups of households are: low farm size, lack of irrigated land,

low quality of non-irrigated land to produce food grain and lack of agricultural inputs and credit.

5.2.4 Occupational Structure and Sources of Household Income

Occupational structures of the local inhabitants have direct linked to their sources of household income. Due to lack of non-agricultural employment opportunities, agriculture is remaining a major occupation for the majority households in the study area. Lack of motarable transportation, industrialization and local development activities compelled to local people willingly or unwillingly to be remains in subsistence agriculture. Thus, a large portion of economically active people unnecessarily engaged in agricultural sector with zero marginal productivity of labour. Details of sources of household non-CF annual average cash income by different caste group and income groups of households of each FUG are presented in the Annex Table 5-J and 5-K.

5.2.4.1 Occupational Activities and Sources of Household Non-CF Income by Caste/Ethnic Groups

Table 5.21 shows the different sources of cash income of the sample households coming from different types of occupational activities of each caste/ethnic group of households in the study area. Agriculture, livestock and off-farm agricultural activities such as remittance/ wage and government services are the most important occupational activities that contribute more than 60% of the total income of households followed by small business and cottage industries and other income. Forest products from own land actually contribute less in terms of direct cash generated by selling some timber and non-timber forest products.

Table 5.21

Occupational Structure and Sources of Household Non-CF Income by Activities of Caste/Ethnic Groups

Occupational Activities and Household Non-CF Income

Caste/Ethnic Groups	N	Agriculture	Livestock	Business[a]	Remit/ Wage	Govt. Service	Forest Based	Other Income[b]	Total Income
Dalit	43	62,150 (5)*	121,500 (9)	256,400 (19)	639,700 (48)	50,000 (4)	1,500 (1)	192,500 (15)	1,323,750
Janajati	156	1,098,800 (19)	634,400 (11)	370,500 (6)	1,510,700 (26)	1,569,000 (26)	10,000 (2)	728,800 (12)	5,922,200
Newar	42	319,100 (26)	207,900 (17)	97,000 (8)	236,000 (19)	282,000 (23)	- -	87,600 (7)	1,229,600
Brahmin/ Chhetri	158	1,876,800 (29)	1,569,700 (24)	535,300 (8)	844,200 (13)	1,334,000 (20)	5,500	410,300 (6)	6,575,800
Total	399	3,356,850 (22)	2,533,500 (17)	1,259,200 (8)	3,230,600 (21)	3,235,000 (21)	17,000 (1.0)	1,419,200 (9)	15,051,350

Source: Field Survey, 2003

Note: N= Number of households

a. Includes business, small craft and cottage industries

b. Old age allowance, interest from money lending and pension

* Percent income from each activity to total income in parenthesis

Table 5.21 shows the different sources of cash income of the sample households of different caste/ethnic groups of households based on engaged in different types of occupational activities. Agriculture and livestock are the dominant occupational activities by which the *Brahmin/Chhetri* households are receiving the relatively higher income followed by government services and remittance/ wage. On the contrary, the most important occupational activities of the *Janajati* households are non-farm activities such as remittance/ wage and government services that contribute more than 50 percent of the total household income followed by agriculture, other activity, livestock and small business and cottage industries. Forest products for them from their own land have negligible contribution in terms of direct cash generated by selling some timber and non-timber forest products. The *Newar* households have relatively high importance of agriculture farming and livestock rearing occupational activities followed by government services and remittance/wage. They are receiving high-income share from agriculture and livestock activities followed by government service activities including school teaching seen as second major occupational activities of the *Newar* households by which relatively income share from these occupational activities is high to total household

income. Income from remittance/ wage occupational activities has also significant contribution to household income.

The notion that business activities are major occupation is the phenomenon of only *Newar* community is untrue in the context of the study area. For instance, income share from business activities is very low of *Newar* caste group. Forest products from own land of the *Newar* households have no any contribution. The relatively high-income share from the occupation of remittance/wage of the *Dalit* households reflects an increasing trend of local youth emigration to abroad for foreign employment. However, local government and private schools are also providing little employment opportunities for the local *Dalit* educated people. Income from agriculture occupational activities is very low. However, income from business and other activities constitute second and third sources of household income for the *Dalit* households. Income from agricultural and livestock activities are seen as gloomy sources of household income for the *Dalit* households.

There are increasing potentials of business activities to be a major occupation for all the caste/ethnic groups of households due to under way of rural road construction from Hile (Dhankutta) to Bhojpur via study area. After completion of this road, households in the study area may have incentive to produce agricultural and livestock related goods such as rice, maize, wheat, potatoes, milk, butter, meat and different types of vegetables, which have a high market value in district headquarters of Dhankutta and Bhojpur.

5.2.4.2 Occupational Activities and Sources of Household Non-CF Income by Income Groups

Table 5.22 shows the different types of occupational activities and sources of cash income of the sample households among the wealth - ranked groups in the study area.

Table 5.22

Occupational Structure and Sources of Household Non-CF Income by Activities of Different Income Groups

Occupational Activities and Household Income

Income Groups	N	Agriculture	Livestock	Business[a]	Remit/ Wage	Govt. Service	Forest Based	Other Income[b]	Total Income
Rich	111	2,111,100 (32.0)*	1,261,400 (19.1)	422,000 (6.4)	955,500 (14.5)	1,383,000 (21.0)	0	460,400 (7.0)	6,593,400
Medium	143	963,200 (16.4)	830,400 (14.1)	479,000 (8.1)	1,732,000 (29.4)	1,217,000 (20.7)	8,500 (0.1)	650,700 (11.1)	5,880,800
Poor	145	282,550 (11.0)	441,700 (17.1)	358,200 (13.9)	543,100 (21.1)	635,000 (24.6)	8,500 (0.3)	308,100 (11.9)	2,577,150
Total	399	3,356,850 (22.3)	2,533,500 (16.8)	1,259,200 (8.4)	3,230,600 (21.5)	3,235,000 (21.5)	17,000 (1.1)	1,419,200 (9.4)	15,051,350

Source: Field Survey, 2003

Note: N= Number of households

a. Includes business, small craft and cottage industries

b. Old age allowance, interest from money lending and pension

* Percent income from each activity to total income in parenthesis

Table 5.22 illustrates that out of total occupational activities, agriculture, government service, remittance/wage and livestock are the dominant occupational activities by which all the sample households are receiving significant and varying amount of annual household income from these occupational activities. Among the wealth-ranked groups, agriculture and livestock are the dominant occupational activities by which the rich income households are receiving the relatively higher income followed by government services and remittance/ wage. Forest products from their own land actually have no any contribution in terms of direct cash generated by selling some timber and non-timber forest products.

Contrary to this, the most important occupational activities of the middle-income households are non-farm activities such as remittance/ wage and government services that contribute more than 50 percent of the total income of households followed by activities of agriculture, livestock and small business and cottage industries. Forest products from their own land have negligible contribution in terms of direct cash generated by selling some timber and non-timber forest products. The relatively high-income share from remittance/wage and government services for the middle-income households reflects an increasing trend of local youth emigration for foreign employment and recruitment in police and security force.

Similarly, the poor-income households have low interest in agricultural occupation due to low farm size. They have relatively higher level of income from government services and remittance/ wage followed by livestock, business and agricultural activities. Similarly, forests products from own land of the poor-income households have contribute a smaller amount in terms of direct cash generated by selling some timber and non-timber forest products. The relatively high-income share from government services and remittance/wage of the poor-income households reflects an increasing trend of local youth recruitment in police and security force and emigration for foreign employment. However, local government and private schools are also providing little employment opportunities for the poor local educated people. Income from agricultural activities is very low. However, income from livestock activities is seen as major third sources of household income for the poor-income households.

There are increasing potentials of business activities to be a major occupation for all the wealth-ranked groups of households due to under way of rural road construction from Hile (Dhankutta) to Bhojpur via study area. After completion of this road, households in the study area may have incentive to produce agricultural and livestock related goods such as rice, maize, wheat, potatoes, milk, butter, meat and different types of vegetables, which have a high market value in district headquarters of Dhankutta and Bhojpur.

5.3 Rural Poverty Scenario across the Caste/Ethnic and Income Groups of Households and Their Socio-demographic and Economic Indicators

5.3.1 Rural Poverty Scenario across the Caste/Ethnic and Income Groups

The traditional methods of poverty portrayal, measurement, and identification are not able to capture the distinctive nature and causes of poverty due to be multidimensional aspects in the concept of poverty. It disregards the capabilities and human development aspects of population, particularly in rural hills of Nepal where inaccessibility, fragility, marginality, underdevelopment, vulnerability, viocelessness etc. are common to a greater degree in addition to low income Therefore, a PRA technique was applied to distinguish all the households into three wealth-ranked groups for realistic assessment of poor and non-poor households using multidimensional local criteria such as average size of land holding, average size of livestock holding, food sufficiency situation and average household income etc. The consensus was made that those households are considered as poor, middle and rich who had land holding size less than 0.5 hectare, 0.5 – 2 hectares and more than 2 hectares, food sufficiency for 12 month, more than 6 month and less than 6 month with national average household income respectively in the PRA discussion held in the study area.

Generally, the assumption is that those households who possess high size of land have less household poverty and those households who possess low size of land have more household poverty does hold true partially in the context of rural study area of Nepal. For instance, Table 5.13b reveals the fact that among the 10.8 percent low caste (*Dalit*) households of total households, 13.9 percent of total *Dalit* households own more than two hectares of land. About 56.0 percent of total *Dalit* households own 0.5-2 hectares of land and 30.2 percent of total *Dalit* households own less than 0.5 hectares of land with an average of 0.9 hectare of land for *Dalit* caste groups of households. Among the 39.1 percent *Janajati* households of total households, 16.7 percent of total *Janajati* households own more than two hectares of land, 62.8 percent of total *Janajati* households own 0.5-2 hectares of land and 20.5 percent of total *Janajati* households own less than 0.5 hectares of land with an average of 1.1 hectare. Similarly, among the 10. 5 percent *Newar* households of total households, 14.3 percent of total *Newar* households own more than two hectares of land, 69.1 percent of total *Newar* households own 0.5-2 hectares of land and 16.7 percent of total *Newar* households own less than 0.5 hectares of land with an average of 1.1 hectare. Among the 39.6 percent *Brahmin* and *Chhetri* households of total households, 35.4 percent of total *Brahmin* and *Chhetri* households own more than two hectares of land, 47.5 percent of total *Brahmin* and *Chhetri* households own 0.5-2 hectares of land and 17.1 percent of total *Brahmin* and *Chhetri* households own less than 0.5 hectares of land with an average of 1.6 hectares. The above discussion indicates that all the caste groups as mentioned above have poverty syndromes and property symptoms in terms land holding size with varying degree and thus, poverty is not the plight of lower cast only and prosperity is not the fate of high caste group only. Thus, the notion that rural poverty is the phenomenon of only small and marginal size of landholdings is untrue in the context of rural Nepal. However, the average farm size of low caste *Dalit* households is so small that it is almost impossible for them to generate enough income to escape poverty.

Rural poverty scenario can be seen within different income class across the farm size categories. Table 5.14b reveals the fact that around 1.0 percent households in the rich income class has land holding size less than one and 27.0 percent households in the rich income class has land holding size 0.5–2 hector. While around 1 percent households in the poor income class has land holding size more than 2 hectors and 21.0 percent households in the poor income class has land holding size 0.5–2 hector. Similarly, around 9.0 percent households in the middle income class has land holding size more than 2 hectors and around 4.0 percent households in the middle income class has land holding size less than one hector.

Thus, based on based on PRA technique using multidimensional local criteria, Table 5.23 illustrates the households belong to rich, medium and the poor wealth-ranked groups from each caste groups in the study area.

Table 5.23

Rural Poverty Scenario across the Caste/Ethnic and Income Groups

Income Groups

Caste/Ethnic Groups	Rich		Medium		Poor		Overall	
	N	Percent	N	Percent	N	Percent	N	Percent
Dalit	10	(23.3)	15	(34.9)	18	(41.9)	43	(10.8)
Janajati	29	(18.6)	51	(32.7)	76	(48.7)	156	(39.1)
Newar	10	(23.8)	18	(42.9)	14	(33.3)	42	(10.5)
Brahmin/Chhetri	62	(39.2)	59	(37.3)	37	(23.4)	158	(39.6)
Overall	111	(27.8)	143	(35.8)	145	(36.3)	399	(100)

Source: Field Survey, 2003.

Table 5.23 shows that among the *Janajati* caste, percentage of the poor households is high (48.7 percent) followed by medium (32.7 percent) and rich (18.6 percent) out of total 156 *Janajati* households (39.1 percent). Similarly, among the low caste *Dalit*, percentage of the poor households is high (41.9 percent) followed by medium (34.9 percent) and rich (23.3 percent) out of total 43 *Dalit* households (10.8 percent). Among the *Newar* caste, percentage of the medium households is high (42.9 percent) followed by poor (33.3 percent) and rich (23.8 percent) out of total 42 *Newar* households (10.5 percent). Likewise, among the *Brahmin/Chhetri* caste, percentage of the rich households is high (39.2 percent) followed by medium (37.3 percent) and the poor (23.4 percent) out of total 158 *Brahmin/Chhetri* households (39.6 percent). In an average, among the caste groups, *Janajati* caste have more poor households (48.7 percent) followed by *Dalit* caste (41.9 percent), *Newar* caste (33.3 percent) and the *Brahmin/Chhetri* caste (23.4 percent) respectively. Contrary to this, among the caste groups, Newar caste have more middle income households (42.9 percent) followed by *Brahmin/Chhetri* households (37.3 percent), *Dalit* households (34.9 percent) and the *Janajati* households (32.7 percent) respectively. Among the caste groups, *Brahmin/Chhetri* households have more rich households (39.2 percent) followed by *Newar* households (23.8 percent), Dalit households (23.3 percent) and the *Janajati* households (18.6 percent) respectively. From all the caste groups, the average percentage of poor households is highest by 36.3 percent than the medium households 35.8 percent and the rich households 27.8 percent out of total 399 households.

It is clear from Table 5.23 that each of the caste group has rich, medium and poor households and population with varying extents and magnitudes. So is the case for different income class (wealth-ranked group) in which each of the income class has low caste (*Dalit*), *Janajati*, *Newar* and *Brahmin/Chhetri* caste group of households and population with varying extents and magnitudes. All the caste and wealth-ranked groups have poverty syndromes and prosperity symptoms. Therefore, poverty is not the plight of lower cast group and poor income class only and prosperity is not the fate of high caste group and rich income class only. However, within the rich income caste groups, the high caste *Brahmin/Chhetri* households are appearing economically high rank than the rest of the rich income households of all the caste groups. *Janajati* households are appearing economically bottom level rank with few rich households even less than *Dalit* and the *Newar* caste groups of households.

5.3.2 Rural Poverty across the Socio-Demographic and Economic Indicators of Different Caste/Ethnic and Income Groups of Households

Poverty is a multidimensional phenomenon associated with multi socio-demographic and economic factors. Average farm size categories, Own productive land in operation, irrigated land in operation, livestock holding, household size, literate persons per household, food sufficiency situation and per capita real income etc. are the essential factors for the poor people. Table 5.24 portrays the profile of existing performance of major socio-demographic and economic indicators for different caste and wealth-ranked groups of households in the study area.

Table 5.24

Socio-Demographic and Economic Profile of Different Caste/Ethnic and Income Groups of Households in the Study Area

	Income Groups			
Caste/Ethnic Groups	Rich	Medium	Poor	Overall
Average Farm Size (hectares)				
Dalit	2.12	0.83	0.32	0.92
Janajati	2.37	1.25	0.53	1.11
Newar	2.12	1.04	0.55	1.14
Brahmin/Chhetri	2.61	1.22	0.41	1.58
Overall	2.46	1.17	0.48	1.28

Irrigated Land per Household in Operation (hectares)

Dalit	0.44	0.15	0.04	0.17
Janajati	0.55	0.14	0.02	0.16
Newar	0.24	0.22	0.05	0.17
Brahmin/Chhetri	0.78	0.37	0.06	0.46
Overall	0.64	0.25	0.04	0.28

Average Household Size

Dalit	7.9	6.1	5.2	6.2
Janajati	6.7	6.2	5.2	5.8
Newar	7.4	7.3	5.6	6.7
Brahmin/Chhetri	6.6	6.2	5.1	6.1
Overall	6.8	6.3	5.2	6.1

Average Number of Children (below 10 years) **per Household**

Dalit	2.7	1.9	1.7	2.0
Janajati	1.2	1.1	1.5	1.3
Newar	1.1	1.8	1.9	1.7
Brahmin/Chhetri	1.0	1.3	1.6	1.3
Overall	1.2	1.4	1.6	1.4

Average Number of Illiterate Persons per Household

Dalit	3.6	2.7	2.8	2.9
Janajati	2.2	1.8	2.1	2.0
Newar	2.1	3.0	2.3	2.5
Brahmin/Chhetri	1.5	1.9	2.3	1.8
Overall	1.9	2.1	2.3	2.1

Average Number of Literate Persons per Household

Dalit	1.1	1.1	1.0	1.0
Janajati	1.5	1.4	0.9	1.2
Newar	2.1	1.4	1.2	1.5
Brahmin/Chhetri	1.7	1.4	0.7	1.3
Overall	1.6	1.4	0.9	1.3

Average Number of Livestock per Household

Dalit	12.8	10.5	4.7	8.6
Janajati	18.6	13.3	7.3	11.4
Newar	14.0	13.3	8.1	11.7
Brahmin/Chhetri	21.2	12.4	10.6	15.4
Overall	19.1	12.7	7.9	12.7

Percentage of Food Deficit Households

Dalit	11.8	35.3	52.9	15.9
Janajati	5.1	25.3	69.7	46.3
Newar	22.2	29.6	48.1	12.6
Brahmin/Chhetri	5.6	35.2	59.3	25.2
Overall	8.4	29.9	61.7	100.0

Per Household Annual per Capita Income (in NRs)

Dalit	6,519	6,146	2,589	4,965
Janajati	9,870	8,610	3,224	6,529
Newar	4,505	4,422	4,208	4,345
Brahmin/Chhetri	9,341	5,614	3,788	6,843
Overall	8,710	6,513	3,409	6,230

Sex Ratio (M/F)

Dalit	0.72	1.04	1.09	0.95
Janajati	1.03	1.08	1.04	1.05
Newar	0.90	0.87	1.00	0.91
Brahmin/Chhetri	0.89	1.06	1.19	1.01
Overall	0.91	1.03	1.08	1.00

Source: Field Survey, 2003.

Following section explains the profile of each socio-demographic and economic indicator for different caste and wealth-ranked groups of households as the above sub-table accordingly.

Average Farm Size by Caste/Ethnic and Income Groups

Rural poverty scenario can be seen within different caste/ethnic groups and income class across the farm size categories. Generally, the assumption is that those households who

possess high average size of land have less household poverty and those households who possess low average size of land have more household poverty does hold true partially in the context of rural Nepal. For instance, the above table 5.24 reveals the fact that all the rich caste groups of households own more than two hectares of land. Brahmin/Chhetri, Janajati and the Newar households except the Dalit households own more than one hectares of land. But poor income households from all the caste groups own less than one hectares of land. Thus, the notion that rural poverty is the phenomenon of only small and marginal size of landholdings is true in the context of rural Nepal. Average farm size of poor households from all the caste groups is so small (0.32 to 0.55 hectare) in comparison with non-poor households that it is almost impossible for them to generate enough income to escape poverty. Therefore, only the farm size cannot be a sufficient factor to define rural poverty.

Irrigated Land in Operation by Caste/Ethnic and Income Groups

Possession of irrigated land in operation would be an actual indicator to distinguish poor and non-poor households in rural area. Table 5.24 indicates that size of irrigated land in operation has a tendency to be a major factor for poor income group of households within each caste/ethnic group. Size of irrigated land in operation for all the poor income groups is so low (0.02 to 0.06 hectares) with an average of 0.04 hectare. Middle-income group from all the caste/ethnic groups of households has low size of irrigated land in operation (0.15 to 0.37 hectare) with an average of 0.25 hectare than rich income group from all the caste/ethnic groups of households (0.24 to 0.78 hectare) with an average of 0.64 hectares. Overall the amount of irrigated land seems scarce due to lack of irrigation sources. However, even lowest size of irrigated land in operation as a whole, the higher caste and rich income groups of households have the possession of irrigated land greater than half but less than one hectare in operation. On the other hand, poorer income groups and lower caste/ethnic groups of households have the possession of irrigated land less than half hectare in operation. This means possession of irrigated land is uneven between caste/ethnic and income groups of households. This indicates that possession of irrigated land in operation seems to be a major factor for all the households to be either rich or poor in rural area.

Household Size by Caste/Ethnic and Income Groups

Household size is considered the major indicator to distinguish poor and non-poor households in rural area. Therefore, the general impression is that rural poverty is the phenomenon of high household size of poor families in rural area. Table 5.24 reveals the fact that the average household size of poor income group from each of the caste/ethnic groups is lower (5.1 to 5.6) than the rich (6.6 to 7.9) and middle-income group (6.1 to

7.3) from each of the caste/ethnic groups. This means poor income households have low household size than the non-poor households. Thus the facts of Table 5.24 contradict the notion that rural poverty is the phenomenon of high household size of poor families and which is untrue in the context of rural Nepal. The reality is that the average household size increases with an increase of non-poor households within each caste/ethnic group category.

Size of Children by Caste/Ethnic and Income Groups

Like the other indicators, average size of children (dependent population) is considered the major indicator to distinguish poor and non-poor households in rural area. The general believe is that those households who have greater number of children (below 10 years of age) they may have more household poverty. Table 5.24 also supports it showing the larger number of average children (below 10 years of age) for poor income group of each *Janajati* (1.5), *Newar* (1.9) and *Brahmin/Chhetri* (1.6) caste/ethnic groups of households because the average number of children per household to them is higher than non-poor income group of each *Janajati* (1.2), *Newar* (1.1) and *Brahmin/Chhetri* households (1.0) respectively. This means that larger number of average children is a major factor for poorer households. Contrary to this, the average number of children is higher for rich (2.7) and middle-income households (1.9) than poor income households (1.7) of *Dalit* households. This indicates that the average number of children per household is minor factor for the poor and non-poor of *Dalit* household.

Number of Illiterate Person by Caste/Ethnic and Income Groups

Illiteracy is a major indicator to distinguish poor and non-poor households among the caste and income groups in rural area. Table 5.24 depicts that among the income groups, in an average, the average number of illiterate persons per household increases with an increase of poor income households and it is decreases with an increase of rich and middle-income households. Thus, the size of illiterate persons per household has positive correlation with poor income households and it has negative relationship with non-poor income households. Among the caste/ethnic groups, in an average, the average number of illiterate persons per household is high for *Dalit* (2.9) followed by the *Newar* (2.5) and *Janajati* (2.0). The average number of illiterate persons per household is low for *Brahmin/Chhetri* (1.8). However, the average number of illiterate person is minor factor for poverty within the *Dalit, Newar* and *Janajati* caste/ethnic groups and within the *Brahmin/Chhetri* group it is a major factor for poverty. Thus, the size of illiterate persons per household has positive correlation with low caste households and it has negative relationship with high caste households. Similarly, among the income groups, in an average, the average number of illiterate persons per household is high for poorer

households (2.3) followed by the middle income households (2.1) and the rich income households (1.9). Thus, the size of illiterate persons per household has positive correlation with poorer households and it has negative relationship with richer households.

Size of Literate Person by Caste/Ethnic and Income Groups

Alike the illiteracy, literacy is considered a major indicator to distinguish poor and non-poor households in rural communities. Table 5.24 shows that among the income groups, in an average, the average number of literate persons per household decreases with an increase of poor income households and it increases with an increase of rich and middle-income households. For example, the average number of literate persons per household is highest for rich income households (1.6) followed by middle income households (1.4) and it is lowest for poor income households (0.9). Thus, the size of literate persons per household has negative correlation with poor income households and it has positive correlation with non-poor income households. Similarly, among the caste/ethnic groups, in an average, the average number of literate persons per household is high for *Newar* (1.5) followed by the *Brahmin/Chhetri* (1.3) and *Janajati* (1.2). The average number of literate persons per household is low for *Dalit* (1.0). Thus, the size of literate persons per household has negative correlation with low caste households and it has positive correlation with the *Newar* households. Thus, the average size of literate person per household is seen to be a major factor for poverty within the each caste/ethnic and income group of households.

Livestock Holdings by Caste/Ethnic and Income Groups

As an economic indicator, livestock holding is a major indicator to distinguish poor and non-poor households in rural communities. Generally, the assumption is that those households who possess high average size of livestock have less household poverty and those households who possess low average size of livestock have more household poverty is true in the context of rural Nepal. For example, Table 5.24 shows that among the income groups, in an average, the average number of livestock holdings per household is low for the poor income households (7.9) followed by the middle-income households (12.7). Rich income households have higher average number of livestock holdings (19.1). Thus, the small size of average livestock holdings per household has negative economic effects (poverty) on poor income households and large size of average livestock holdings has positive economic effects (prosperity) on non-poor income households. Similarly, among the caste/ethnic groups, in an average, the average number of livestock holdings per household is low for *Dalit* (8.6) followed by the *Janajati* (11.4) and *Newar* (11.7). *Brahmin/Chhetri* households have higher average

number of livestock holdings (15.4). Thus, the small size of livestock holdings per household has negative correlation with poverty of low caste households and larger size of average livestock holdings has positive correlation with prosperity of high caste households. Thus, the average size of livestock holdings per household is seen to be a major factor for poverty within the each caste/ethnic and income group of households.

Food Grains Inadequacy by Caste and Income Groups

Similar to the indicator of livestock holding, food sufficiency situation is also a major indicator to distinguish poor and non-poor households in rural society. Table 5.24 demonstrates that majority of rural households are appearing in food deficit situation. Among the caste/ethnic groups, out of total food deficit households, in an average, the percentage of food deficit households is high for *Janajati* households (46.3 percent) followed by *Brahmin/Chhetri* (25.2 percent), *Dalit* (15.9 percent) and *Newar* households (12.6 percent) respectively. This indicates that the notion of more food inadequacy is the phenomenon of only low caste households is untrue in the context of rural area in Nepal. Similarly, among the income groups, the percentage of food deficit households is high for poor income households (61.7 percent) followed by middle income households (29.9 percent) and rich income households (8.4 percent) of each caste group category. Thus, the notion that more food inadequacy is the phenomenon of only the poor income groups of households seems true in the context of rural Nepal.

Per Capita Income by Caste/Ethnic and Income Groups

Per capita income is a widely accepted measure to draw an income poverty line to reveal the poor and non-poor households. Table 5.24 illustrates that among the caste/ethnic groups, per household per capita income is lowest for the *Newar* households (NRs.4, 345) followed by the *Dalit* households (NRs.4, 965) and *Janajati* households (NRs.6, 529) respectively. Per household per capita income is highest for the *Brahmin/Chhetri* households (NRs.6, 843). Per capita income distribution between the poor and non-poor households of *Newar* is not so different but it is severe between the poor and non-poor households of *Janajati* followed by *Brahmin/Chhetri* and *Dalit* households respectively. The mean per capita income of all the caste/ethnic groups is very low (NRs.6,230) in comparison with national mean per capita expenditure of NRs.15,162 (NLSS, 2003/04). Likewise, among the income groups, per household per capita income for poor income group of households is less than twice (NRs.3, 409) of the middle-income group of households (NRs.6, 513). Per household per capita income is highest for the rich income group of households (NRs.8, 710). Per capita income of all the poor households from each caste/ethnic group is appeared far less than the national poverty line income of NLSS-I and II (NPC/CBS, 1995/96 & 2003/04). Similarly, the mean per capita income

of the poorer and richer person are also very low (NRs.3, 409 and NRs 8,710) in comparison with national mean per capita income for poorer and richer person (NRs.5, 681 and NRs 36, 415) respectively (NLSS, 2003/04).

Sex Ratio by Caste/Ethnic and Income Groups

Sex ratio refers the ratio of male member to female member in the family. High sex ratio indicates more members of male in the family than female members and vice versa. Table 2.10 shows that among the wealth-ranked groups, in an average, the sex ratio of poor income households is high (1.08) followed by middle income households (1.03) and the rich income households (0.91) respectively. This indicates that less number of female than the male members in the family has poverty effects as seen in the poor and non-poor income group of most caste/ethnic groups of households. More number of female than the male members has no poverty effects as seen in rich income group of most caste/ethnic groups of households. Thus, high sex ratio for the poor income group followed by middle-income and rich income households supports the notion that rural poverty is the phenomenon of high sex ratio. Contrary to this, among the caste/ethnic groups, in an average, *Janajati* and *Brahmin/Chhetri* households have highest sex ratio (1.05 and 1.01) and the *Dalit* and *Newar* households have lower sex ratio (0.95 and 0.91). Likewise, among the poor households, poor *Brahmin/Chhetri* households have highest sex ratio followed by poor *Dalit* households (1.09), poor *Janajati* households (1.04) and the poor *Newar* households (1.0) from each caste groups. However, it is high for middle-income *Janajati* households (1.08) than the poor *Janajati* households. Similarly, the average sex ratio of rich *Newar* households is high (0.90) than middle-income *Newar* households (0.87). Rest of the caste/ethnic groups of households from rich income group has lower average sex ratios than the middle income and the poor income households. Thus, high sex ratio of *Brahmin/Chhetri* households than the *Dalit* households does not support the notion that rural poverty is the phenomenon of high sex ratio.

In summary, poverty affects all the caste/ethnic as well as income groups of households in the society. However, Table 5.24 depicts the profile of existing performance of major socio-demographic and economic indicators for different caste/ethnic and income groups of households ranking the poor and low caste households at the bottom level performance of most socio-demographic and economic indicators than those of non-poor and upper caste households in the rural area. The state of relative poverty in rich and middle-income households as well as higher caste group of households seems transient; with small efforts, these households could escape poverty. While, poverty remains chronic in poor income group of households as well as low caste/ethnic group of households; due to their small farm size, lack of irrigated land, small livestock holdings, very low level of household income, etc. and without poverty related specific indicator-wise targeted interventions they may be unable to escape absolute poverty.

CHAPTER 6

6 INSTITUTIONAL MECHANISM, PROPERTY RIGHTS AND DISTRIBUTIONAL RULES OF COMMUNITY FOREST MANAGEMENT IN RURAL NEPAL

The management of common forest land as community forest in Nepal is in practice since 1978. Studies showing the linkages between community forestry and common property resource are scare in the country. This chapter discusses institutional characteristics and distributional rules of community forest as common property resources and the principles and practices of community forestry in Nepal, which is an example of common property resource management between government agencies and users (co-managers). Community Forest User Groups (CFUGs) are the institutions responsible to manage the common property forest resources at local level. For efficient, equitable and sustainable functioning of CPR, suitable institutional mechanisms, well-defined property rights and equity based distributional rules must complement each other. In the absence of effective institutions, resources are degraded and destroyed (Gibbs & Bromely, 1992).

6.1 Institutional Mechanisms of Community Forest Management

The emergence of forestry for rural development in the 1970's challenged the timber-bias profit-oriented industrial forestry and stressed the importance of the participation of the rural people in forestry and the formation of a social organization capable of sustainable forest management (Wiersum, 1989). These social organizations are the non-government local institutions known as Common Property Resource Institutions (CPRIs). Institution refers as the set of rules actually used (the working rules or rules in use) by a set of individuals to organize repetitive activities that produce outcomes affecting those individuals and potentially affecting others (Ostrom, 1992). She was further noted that the development literature defines institutions in three ways:

- As a specific organization in a particular country,
- As established human relationships in a society, and
- As roles that individuals use to order specific relationships with one another.

Any management of natural resources needs the establishment of property rights. This is more important in the case of CPR because the management of commons without property rights may become "the tragedy of the commons". Use rights in most of the forests of Nepal are ill-defined and are being managed as open access property regimes; a

situation comparable to what Hardin called 'the tragedy of the commons'. Large-scale deforestation in the past was largely due to ever-changing and ill-defined property rights, flawed Government policies and a lack of proper management. Realizing this, community forestry aims to establish the property rights of users over the resources, which were either in the state of open access or are managed by local people in the form of *de facto* property rights situation so that all users (owners) are made copartners in terms of use-rights (Karki et al., 1994). In this connection, (Jackson & Ingles, 1995) have rightly defined this situation as Community Forestry (CF) refers to the situation where forests are controlled and managed as common property by groups of rural people who agree to use them to support their farms and households.

Such institutions are capable of functioning independently as a viable alternative to government organizations for the management of forest resource in various circumstances. (e.g. self-emerging indigenous forest management systems (Fisher, 1989) externally-sponsored groups such as CFUGs formed under CF in Nepal (Hobley, 1996). Some of the institutional mechanisms and structure based on field observation that is common to most CFUGs regarding forest management, institutional and structural processes considered in this study are discussed below.

During the *Panchayat* era, Village *Panchayat* was the local political unit. At the beginning, it was assigned as the institution for local forest management. Due to lack of proper forest management and more politically oriented, it was incapable to management of local forest resources properly. Moreover, only a limited area could be handed over to such committees. Studies have shown that political units like *panchayats* were unable to enforce any regulations about CPRs, rather they played decisive roles in converting CPRs into open access (Jodha, 1986). However, initially, the *panchayat* was considered to be an suitable governmental unit, on the other hand, it was found that forests were controlled at a lower operating level than the *panchayat.* The *panchayat* being a bigger, social and political unit consensus could not be reached regarding management of the forest and distribution of benefits. CFUGs at sub-village level with unrestricted administrative boundaries are now recognized as the optimum functional institutions for implementing CF (Hobley et al., 1996).

CFUGs emerged as an alternative type of group, which is more cohesive and purposeful than the *Panchayat.* The present policy and legislation recognize CFUGs as the appropriate local level institutions to establish the partnership with the state. CFUGs are empowered through legislation and are responsible for forest management. CFUGs are institutions at the grass roots level and are viewed as the main mechanisms through which all CF activities will be conducted. The possibility of law enforcement and mutual

control is higher in smaller groups like CFUGs, which helps reduce the potential problem of free riders in CPR management (Karki et al., 1994).

In the present system, control of forest rests with CFUGs. The assembly of a FUG is supreme in making all decisions. Assemblies prepare constitution and Operational Plan (OP), define and recognize use rights, decide all kinds of rules, and make forest management decisions including protection, harvesting, benefit sharing, and mobilization of CFUG funds for community development works. The assembly elects a Forest User Executive Committee (FUEC) for the execution of CFUGs decisions and to conduct day-to-day work.

6.1.1 Structure of Forest User's Executive Committee under the Community Forest User Groups in the Study Area

Presently, as across the country, all the CFUGs are governing the functioning of community forest as per the Forest Act 1993 and the Forest Regulations 1995 in the study area. The CF field planning process starts formally with the identification of co-owners of the resource through a procedure similar to Participatory Rural Appraisal (PRA). The community is then organized as a CFUG and the District Forest Office (DFO) issues a certificate of recognition to the CFUG. Through the series of meetings and discussions among the users the followings arrangements are made by consensus of the users:

- Identification of users and recognition of mutual use-rights
- Preparation of a constitution describing the conditions for collective action
- Formulation of operational rules describing the terms and conditions for managing resources (An operational plan)

Having done the above procedures, the forest is then formally handed over to the FUG. Review and revision of the OP could be done as and when needed (HMG, 1995 b).

However, all the CFUGs have their own institutional mechanism regarding the extraction and provision rules, detection and graduated sanctions, collective-choice arrangements, conflict-resolution mechanisms and monitoring systems. Forest user's assembly is the highest authority, which makes decisions regarding the rules of community forest management and governance. The constitution of the CFUG is prepared by the general assembly. The five-year operational plans, defines user rights, and determines rules for forest product collection and distribution should be sanctioned by the general assembly. In addition, CFUG decides to mobilize and use of CFUG funds for implementation of various community development works. The executive committee of the CFUG implements decisions as per the direction of assembly. All CFUGs have written norms about penalties, fines and graduated sanctions for those who violate the rules and

regulations of CF. Since the operational rules of CF vary from one to another and it is difficult to document them all.

All the CFUGs have formed a working committee, Forest User's Executive Committee (FUEC) comprises of 7 to 11 members including two women. Generally, 12 FUEC meetings and 1 to 2 number of assembly are held in a year.

Table 6.1 presents about the proportion of average representation scenarios of members to total number of users in the entire forest user's executive committee by caste/ethnic group and sex in the study area.

Table 6.1

Total Number of Users and FUC Members by Caste/Ethnic and Sex

Caste/Ethnic Groups	Total User Members			Total FUEC Members and Percentage of FUEC Member to Total User Member					
	Male	Female	Total	Male	Percent	Female	Percent	Total	Percent
Dalit	129	136	265	8	6.2	5	3.7	13	4.9
Janajati	465	442	907	45	9.7	12	2.7	57	6.3
Newar	135	148	283	12	8.9	5	3.4	17	6.0
Bramhin/Chhetri	482	479	961	63	13.1	7	1.5	70	7.3
Grand Total	1,211	1,205	2,416	128	10.6	29	2.4	157	6.5

Source: Field Survey, 2003.

According to Table 6.1 with a total of 2,416 users, average 7.3 percent of *Brahmin/Chhetri* was participated in executive committee followed by 6.3 percent of *Janajati,* 6.0 percent of *Newar* and 4.9 percent of *Dalit* respectively. Most of the caste/ethnic groups, gender representation in forest executive committee seems more uneven. The proportion of female user representation to its total users in forest executive committee is very low of *Brahmin/Chhetri* (1.5 percent of total *Brahmin/Chhetri* female users) followed by *Janajati* (2.7 percent of total *Janajati* female users) *Newar* (3.4 percent of total *Newar* female users) and *Dalit* (3.7 percent of total *Dalit* female users). While male representation in forest executive committee in comparison with female representation is high in *Brahmin/Chhetri* (13.1 percent of total *Brahmin/Chhetri* male users) followed by *Janajati* (9.7 percent of total *Janajati* male users), *Newar* (8.9 percent of total *Newar* male users) and *Dalit* (6.2 percent of total *Dalit* male users) respectively.

Table 6.2 presents about the average representation scenarios of members in the entire Forest User's Executive Committee by caste/ethnic group and sex in the study area.

Table 6.2

Total and Percentage of FUC Members by Caste/Ethnic and Sex

Caste/Ethnic Groups	Sex					
	Male	Percent	Female	Percent	Total	Percent
Dalit	8	61.5	5	38.5	13	8.3
Janajati	45	78.9	12	21.1	57	36.3
Newar	12	70.6	5	29.4	17	10.8
Bramhin/Chhetri	63	90.0	7	10.0	70	44.6
Grand Total	128	81.5	29	18.5	157	100.0

Source: Field Survey, 2003.

Table 6.2 illustrates that the number of members from a particular caste/ethnic group in the forest user group still plays a major role in the formation of FUG leadership. Out of the total of 157 members in sixteen FUECs including all the post, 70 numbers (44.6 percent) were filled by *Bramhin/Chhetri* followed by *Janajati* 57 number (36.3 percent), *Newar* 17 number (10.8 percent) and *Dalit* 13 number (8.3 percent) respectively. Table 6.2 shows that in most caste/ethnic groups the level of female representation in FUEC is very low in comparison with male representation. It is argued that women are the major collector of forest product and they know which forest product to give highest priority to for collection, which will have an impact on agriculture farming and its food value etc. However, very low level of female participation in FUEC reveals this to be true partially in the context of rural study area of Nepal where in an average, less than 20 percent of female members (against the provision of one third of the user's executive committee) are representing in local user's executive committee to manage community forest in a sustainable manner.

Among the caste/ethnic groups, only *Dalit* had slightly more than one third female representation (38.5 percent) in forest user's executive committee followed by *Newar* (29.4 percent), *Janajati* (21.1 percent) and *Bramhin/Chhetri* (10.0 percent) respectively. Most female members were simply nominated and they had no idea that they were participating as a member of an executive committee. Some women members said that they were there because their husbands or father had forced them to stay.

The reasons of low level of female representation in executive committee may be the traditional perceptions of women's roles obligations and customary practices in family and property relations that do not permit female to participate in public domain. In the local rural context of Nepal, forests belong to the public domain in which males participate, whereas female are perceived as belonging to the domestic sphere or household. Similarly, the other possible reasons of low level of female representation in

executive committee may be the low status of female than that of male in society and in family. As most of the adult females are illiterate, many of them are still unaware of their legal rights or are unable or unwilling to exercise them. Not a single female ranger was found in the two districts in the study area. In the course of discussions with a number of females who are on executive committees, all of them said that they could attend the village assembly meeting of the CFUG but could not hold higher positions like the chairman or secretary because of domestic work burden.

Therefore, there is a little incentive or motivation for rural women to represent in executive committee and participate in management of community forest. Scholar of commons sufficiently demonstrated that the level of women's participation in forestry programmes would remain low even in the future (Dahal, 1996). Women's representation is less than one percent at various levels of Village Development Committees and District Development Committees in Nepal (Acharya, 1996). However, development of an appropriate institutional mechanism to avoid dominance of rural elite and to represent active participation of women and disadvantage group in forest executive committee will only in fact can empower local people in the decision making process.

6.1.2 User's Representation in Forest User's Executive Committee in Relation to FUG Leadership

Tables 6.3a and 6.3b show the user's representation in forest user's executive committee in relation to FUG leadership in the study area.

Table 6.3a

Numbers of Representation in FUC by Caste/Ethnic, Sex and Designation

Caste/Ethnic Group and Sex

Posts	*Dalit*			*Janajati*			*Newar*			*Brahmin/Chhetri*			Total Male	Total Female	Grand Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total			
Chairman	0	0	0	7	0	7	1	0	1	8	0	8	16	0	16
V.Chairman	0	0	0	5	1	6	1	0	1	8	0	8	14	1	15
Secretary	0	0	0	5	0	5	2	0	2	9	0	9	16	0	16
J.Secretary	0	0	0	3	1	4	1	0	1	6	0	6	10	1	11
Treasurer	0	0	0	6	0	6	2	0	2	8	0	8	16	0	16
Member	8	5	13	19	10	29	5	5	10	24	7	31	56	27	83
Grand Total	8	5	13	45	12	57	12	5	17	63	7	70	128	29	157

Source: Field Survey, 2003.

Table 6.3b

Percentage of Representation in FUC by Caste/Ethnic, Sex and Designation

Caste Group and Sex

Posts	*Dalit*			*Janajati*			*Newar*			*Brahmin/Chhetri*			Total Male	Total Female	Grand Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total			
Chairman	0.0	0.0	0.0	100.	0.0	43.8	100	0.0	6.3	100	0.0	50.0	100	0.0	10.2
V.Chairman	0.0	0.0	0.0	83.3	16.7	40.0	100	0.0	6.7	100	0.0	53.3	93.3	6.7	9.5
Secretary	0.0	0.0	0.0	100.	0.0	31.3	100	0.0	12.5	100	0.0	56.3	100	0.0	10.2
J.Secretary	0.0	0.0	0.0	75.0	25.0	36.4	100	0.0	9.1	100	0.0	54.5	90.9	9.1	7.0
Treasurer	0.0	0.0	0.0	100.	0.0	37.5	100	0.0	12.5	100	0.0	50.0	100	0.0	10.2
Member	61.5	38.5	0.2	65.5	34.5	34.9	50.0	50.0	12.0	77.4	22.6	37.3	67.5	32.5	52.9
Grand Total	61.5	38.5	0.1	78.9	21.1	36.3	70.6	29.4	10.8	90.0	10.0	44.6	81.5	18.5	100

Source: Field Survey, 2003.

Tables 6.3a and 6.3b depict about the average representation scenarios of key post holdings and members in the entire forest user's executive committee by caste, sex and post in the study area. The post of chairman, vice-chairman, secretary, joint-secretary and treasurer are considered as key post to be a functional FUG leader. Out of the total 16 post of chairman, eight post (50 percent) were hold by only male *Bramhin/Chhetri*, followed by only male *Janajati* (48.3percent) and only male *Newar* (6.3 percent) respectively. The representation of both male and female *Dalit* in all the key posts is completely nil whose total numbers of user were 265. Likewise, most females from rest of all other caste groups in the key posts of forest user's executive committee are almost nil whose total numbers of user were 1205. Only one female vice-chairman and Joint-Secretary from the *Janajati* caste were represented in the name of female in the key posts in the entire forest user's executive committee in the study area. The trends of other key post holding is as the position of chairman occupy by only male *Bramhin/Chhetri*, only male *Janajati* and only male *Newar* groups respectively. The trend of general membership post holding is also same as key post holding i.e. higher number of male member representation of *Bramhin/Chhetri* followed by *Janajati, Newar* and *Dalit* respectively. All the key post holders including the members were elected by consent. In such a discriminatory representation in the entire forest user's executive committee in the study area, the decision-making process is likely to be biased in favor of a particular person, caste/ethnic group and sex and hence one could hardly expect equal benefit from the communal management of common property forest resources through active participation by all the users. Thus, actually, it is difficult to realized that how the community forest could be a common property for all.

As the Hindu caste structure is the basis of the rural social structure, the high caste Hindu groups (*Bramhin/Chhetri*) consider themselves culturally superior to other groups, especially the *Dalit* groups (*Kami, Damai, Gaine and Sarki*) who are placed at the bottom of the Hindu caste hierarchy. Other groups such as *Janajati* (*Rai, Magar, Limbu, Gurung, Tamang, Serpa, Bhujel and Majhi*) and *Newar* occupy the middle position between the two *Bramhin/Chhetri* and *Dalit* caste groups. On the other hand, the so called high caste *Bramhin/Chhetri* is generally big landowners, is better educated, and plays a key role in local politics. Most *Janajati* and *Dalit* households are dependent economically to the high cast as they provide loans and other supports when need arises. The occupational and so called low caste groups provide services to *Bramhin/Chhetri* and *Janajati* groups under the traditional *Bali* system. For this, these groups are provided with grain on an annual contract basis. In such a case, it is difficult to except high representation of key post including general member in the forest user's executive committee for the *Dalit* against *Bramhin/Chhetri* and *Janajati* groups. The detail of representation in FUC by caste/ethnic, sex and designation are presented in Annex Tables 6-A, 6-B, 6-C and 6-D.

6.2 Property Rights Structure over Forest Resources in Nepal

The mid-eighteenth century marks the beginning of Nepal's political unification and its modern history (Brown, 1996). Before this period, what we now refer to as Nepal was composed of autonomous mini-states- *Baise and Choubise*. This changed when Prithvi Narayan Shah unified modern Nepal after a series of military campaigns spanning three decades. At the height of expansionist glory, the boundaries of Nepal stretched from Sikkim to the Kangra Valley. In many areas, property rights were largely communal before the arrival of Indo-Aryan groups (1000 to 2000 years ago). Associations between individuals were based on kinship and community alliances (Caplan, 1970). Landholdings were collectively owned according to a property rights system known as *kipat*. This system took into consideration issues of fairness and equity, by balancing family needs and communal responsibility. K*ipat* was gradually eroded by the farming technologies and the caste-structured social institutions brought with Indo-Aryan immigrants (Poffenberger, 1976). Common lands, comprising mostly forested areas, continued to be regulated through customary rules for protection and use. But cultivation took on more privatized or permanent features, with the construction of terraced fields and defined inheritance rights.

Political unification and territorial expansion necessitated the formation and maintenance of service organizations-administrative, bureaucratic, and military. In Nepal, there were

few sources for revenue other than land. As a result, the state financed its administrative structure and military operations through land grants and assignments, known as *birta* and *jagir*. Over time, large areas were appropriated as rewards to civil and military officials, members of the nobility, chieftains who conquered principalities, and others. These grants had the effect of securing loyalty through favoritism and cooptation; they led to the formation of a landed aristocracy and absentee landlordism (Regmi, 1971; Shrestha, 1990). Under *birta* and *jagir* landholders were provided superior title and monopoly over the land by virtue of royal sanction. They used tenant peasants to cultivate their lands, and routinely required higher rents and production shares than were stipulated by the government.

In 1846 political power passed from the Shah Dynasty to Jang Bahadur Kunwar (who later changed his name to Rana). Jang Bahadur became prime minister and commander-in-chief. He established hereditary Rana family rule. The monarchy was sequestered as a figurehead institution (English, 1985). The Ranas continued with the Shah Dynasty's methods of appropriating surplus through taxation and tributary relations. The Rana Regime, however, granted privileges mostly to those of Rana lineage. By the end of the nineteenth century an estimated 25 percent of all income-yielding lands were controlled by Ranas (Regmi, 1988). This figure increased to 75 percent by 1950 (Regmi, 1978).

In 1951, the Ranas were kicked out and King Tribhuvan ruled the country from 1951 to 1955. After King Tribhuvan, Mahendra became King of Nepal with party less Panchayet system permitting general elections in 1959. So far, forest resource management is concerned, it was technically "belonged" to the State, wooded areas were officially placed under government protection and control only in 1957, with the passage of the Private Forest Nationalization Act. Thus, in Nepal a system of forest administration barely existed until the 1950s (Mahat, Griffin, & Sheperd, 1986). There were different perspectives on the objectives and results of Forest Nationalization Act. Some people argue that the real purpose of the Act was to reduce the area of land controlled by cronies of the Rana regime (Joshi 1989; Gilmour & Fisher, 1991). Others claim that this usurpation of forest area by the government led to widespread felling (Bajracharya, 1983; FAO/World Bank, 1979). (Gilmour & Fisher, 1991) note that there may have been a crisis about 1950, with the instability that followed the collapse of the Rana regime, but it is doubtful that the Nationalization caused widespread or unusual amounts of deforestation. Mostly, rural residents remained unaware of the Act (Carter, 1992; Karan & Ishii, 1996). Forest Acts in 1961 and 1967 defined forest categories and methods for describing, registering, and demarcating forest area. Operationally, however, these provisions were largely unenforceable.

The Forest Department was unable to effectively manage, monitor or protect the vast tracts of national forests. Customary forest management regimes either have thus de facto operated in conflict with or parallel to official government policies. Because government intervention capacity remained limited, customary practices continued in many areas. Studies suggest that these systems vary regionally (north to south, and west to east) in relation to climatic variations, mountain ecology, forest composition, the ethnic groups involved, and the size function and rules for regulating use. Customary systems included agreements for protection, regulation of access, silvicultural practices, and the distribution of forest products. (Fisher, 1989; Gilmour, 1990; Messerschmidt, 1986; Campbell, Shrestha, & Euphrat, 1987).

Starting in the 1970s, projections of massive declines in Himalayan forest cover incited worldwide concern. While initial estimates have proved wrong, debates about the condition of Nepal's forests, and the causes and consequences of deforestation continue (Bajracharya, 1983; Eckholm, 1975; Hamilton, 1987; Ives, 1987, 1991; Ives & Messerli, 1989; Metz, 1991; World Bank, 1978). Multiple anthropogenic activities have contributed to conditions of forest cover in the Himalaya. studies indicate, however, that deforestation in the Nepalese hills is neither as recent nor as widespread as previously implied. Many Middle Hill forests were reduced to their present boundaries between 1750 and 1900 as a result of *jagir* and *birta* land tenures which, as already mentioned, encouraged the conversion of forests into agricultural holdings in order to extract maximum land rents from peasant cultivators (Mahat, Griffin, & Shepherd, 1986).

While some forests have declined in density, other forests are in better condition than before. In many areas, moreover, there is evidence indicating a substantial increase in the number of trees planted on private land. Concern about the condition of Himalayan forests and broader environmental concerns have provided (and continue to provide) a charter for governments and international agencies working in Nepal, influencing and otherwise shaping forest-related policies since the mid-1970s. After king Mahendra, Birendra became the king of Nepal in 1972. Important changes in forest legislation began king Birendra's regime in response to: (a) the National Forestry Conference held in Kathmandu in 1975 (b) the findings of "A Task Force on Land Use and Erosion Control" (National Planning Commission 1974) and (c) eco-doom reports by (Eckholm, 1975; & World Bank, 1978). These nearly simultaneous occurrences served to focus national and international attention on forests and deforestation. The resulting discourse was instrumental to the creation of the 1976 National Forestry Plan and the type of state-sponsored community forestry, which was officially adopted at that time. The National Forestry Plan offered provisions for handing-over limited areas of government land to village *panchayats*, with technical assistance provided by the Forest Department.

However, the “community” component of community forestry remained absent. Up to 125 hectares of severely degraded (often totally deforested) land could be “handed-over” to the local *panchayat* leaders (*pradhan pancha*) for planting and protecting seedlings under the supervision of the District Forest Officer. The emphasis was on planting and protection. Nurseries were built, plantations were established, forest watchers were hired, and barbed-wired fencing was used to enclose areas.

This attempt at community forestry did not appeal to local people, and the lack of enthusiasm showed. Early studies indicated that community forestry was being imposed and that there was very little information about the policy. For example, a 1985 survey in Dolakha district of 419 chairpersons revealed that most of them did not know if they were members of a community forest committee or what they were expected to do. By 1986 (approximately 10 years on), a measly 48,541 hectares of forests had been handed-over as community forests to *panchayats*, despite intensive inputs from FAO, the World Bank, and bi-lateral projects. In this stage, community forestry existed mainly in its rhetoric. It was a “naive phase,” with nurseries and plantations being established through the “help” of local labor at the expense of institutional development and real participation. Convincing Forest Department staff and other stakeholders to “let go” or otherwise hand-over forests (both benefits as well as responsibilities) to local people was a tentative, experiential, and dialogical process.

Starting in the mid-1980s small-scale pilot projects were used to demonstrate local people’s capacity for both protecting and managing forest resources. New forms of extension were experimented with in Dolakha and Sindhu Palanchowk districts; and attitudinal reorientation trainings of Forest Department staff -- away from “policing” -- were initiated in Dhankuta district. Consultants working through bi-lateral projects in conjunction with Forest Department staff, primarily rangers, tested these ideas. The individuals involved, and the projects they represented, were in a better position to take risks and experiment with resource management partnerships. If an activity was not successful, it was discarded. However, if it proved successful, it was replicated (Gronow, 1987; Gronow & Shrestha, 1988; Gronow & Shrestha, 1991). Only in the late 1980s were contradictions in community forestry-related policy and local-level applications mediated through changes in policy. In 1988 participants of the first community forestry conference pointed-out the limited role that local people were playing in community forestry. Reality-checked by the success of the pilot-projects, the management capabilities of local people started to be taken seriously by a larger circle of bureaucrats, politicians, and donors. Key individuals were convinced that further devolution was necessary to improve forest management and resolve conflicts between local-level

concerns and *panchayat*-based applications in policy. The “user group” concept began to be recognized.

In this same period the Ministry of Forests and Soil Conservation (in consultation with FINNIDA) was preparing the “Master Plan for the Forestry Sector” (MPFS). Though mostly confined to Kathmandu-based stakeholders, drafts of the Master Plan were made available for public scrutiny. There were over 100 revisions and numerous reincarnations of this 14 volume document. (MPFS, 1990) eventually recommended: no ceiling on the area of forest handed-over; that forests should be handed-over to “user groups” (not *panchayats*); that all the benefits from the forest should remain with the user group; that women and the poor should be involved in the management of community forests; and, that the process of handing-over forests should be expedited. Under the MPFS, forest user groups were identified as the appropriate local institution responsible for the protection, development, and sustainable utilization of local forests. In addition, community and private forestry were classified as the highest priority programs for the forestry sector in Nepal.

Following a period of violent civil unrest in the spring of 1990, King Birendra, agreed to abandon the *panchayat* system, allow political parties, and accept constitutional limits on his power. A new constitution was formed in 1990, with elections first held in May 1991. Since 1991, there have been numerous changes in government, and increasing frustration with the political process. Some people argue that democratic Nepal is little different from *panchayat* Nepal (Brown, 1996). This assessment, however, discounts gains that are slowly being made through a free press and other broader based developments supporting civil society.

After multi-party democracy was restored in 1990, the Forest Act of 1993 and the Forest Regulations of 1995 was framed by Nepalese government with more autonomy to forest user groups as self- governing institutions with rights to acquire, transfer, and sell forest products under community based property right regimes. However, these provisions have meant that while the basic objective of community forestry remains only the fulfillment of subsistence needs for local people.

In 1978, Nepal was adopted community forestry as a new strategy that “initially emphasized people’s participation in reforestation of degraded lands” (Hunt *et al*. 1996). By the late 1980s, community forestry had been transformed to include participatory forest management and rural development. The basis of participatory forest management is the handing over control of local forests to community forest user groups that have locally recognized rights to use different forest products. The Forest Act in 1993, supported by the Forest Rules issued in 1995, gave CFUGs legal rights to all forest

products from their forest (but not rights to sell the land, build houses or cultivate the area) “in return for assuming responsibility for protection of the forests” (Hunt et al., 1996).

To date, more than 14,258 CFUGs, with 1,640,239 household, are managing about approximately 1,187,022 hectares of natural as well as degraded forest areas under the local community-based system (HMGN/CPFD, 2006). Yet, community forestland remains the property right of government. The user group is not allowed to sell the land or hand-over the forest to another user group. Forest user group members have short-term usufruct rights only (one operational plan may be valid for five year only), they can exclude outsiders, and they have autonomy in management practices and the collection and sale of forest products, but they do not “own” or otherwise have title to the land. Without long-term usufruct rights, continued outside financial and institutional support communities may not likely to encourage sustainable forest management in the face of weak market incentives. Due to lack of these and more subsistence-oriented policy, community forestry in Nepal has proven less dependent.

While it could be argued that this makes community forests only nominally user group property, most forest users consider these forests as their collective property. The refrain “*hamro ban*” (our forest) is common when local users speak about or refer to their community forest.

Based on a conceptual schema proposed by (Schlanger & Ostrom, 1992) the following collective rights can be described in the context of CF management in Nepal.

1) Operation-Level Property Rights:

Access rights: All defined users have a right to enter into community forestry as per specified rules and an agreed-upon operational plan, i.e., block, time, months, season etc.

Withdrawal rights: All users are entitled to harvest pre-defined types and units of forest products from community forest.

2) Regulation Rights: A regulation rights consists of the following:

Management rights: Decisions regarding operational rules on forest protection, harvesting, utilization and sanctioning for rule infractions are made by CFUGs.

CFUGs can plant long-term cash crops like medicinal herbs and other non-timber forest products (NTFPs) without distributing the main forestry species (collectively owned) and they can establish forest-based industries.

Users can amend the operational plan by simply informing the forestry authority, they can fix the price of the forest products irrespective of the government royalty, and they can use surplus funds for community development work.

Exclusion rights: Users themselves identify the traditional users of CF and they reserve the right to form CFUGs and Committees through consensus within the community. They define who the included users are and who are excluded persons. CFUG can provide membership to new entrants (migrating households) under certain conditions.

Alienation rights: There is no mechanism by which user group members can sell or lease their share of rights to other users of the same group. Products from CF can only be used for subsistence needs; not for commercial purpose. Users are not allowed to sell their private share of the produce in the market.

The past decade has witnessed that property rights structure over forest resources have frequently changed in Nepal. Under the Forest Nationalization Act of 1957, a very controversial step was taken in the history of forest management in Nepal. Huge tracts of forests previously managed as private and common property were brought under the state control. However, there is a huge debate on forest nationalization and the deforestation hypothesis in Nepal (Ives & Messerli, 1989; Fisher, 1990). Many scholars believe that local communities throughout the country reacted negatively to forest nationalization believing that their traditional rights of access and use had been curtailed (Bromley & Chapagain, 1984; Bromley, 1991). Consequently, this act increased the rate of deforestation as villagers hurried to convert affected lands into agricultural use to exempt them from the transfer (Bromley, 1991). In response, the government introduced another Forest Act of 1961, which was more focused on forest administration. This Act, which further consolidated the notion of forest nationalization, was amended in 1978 to include different forest management regimes such as Panchayat Forests, Panchayat Protected Forests, Private Forests, Leased Forests and Religious Forests. By the mid 1970s, it was clear that local people had to be involved in every aspects of forest management. As a result, the new and far-sighted Community Forestry Legislation and Decentralization Act were passed in 1982. The (MPFS, 1988) spells out a comprehensive policy statement for CF management and emphasizes that control of forest should be turned over to Community Forest User Groups (CFUGs).

As a result, Forest Act of 1993 and Forest Rules of 1995 came in place with an increasing emphasis on community-based resource management under the communal collective property regimes to have a focus on poverty alleviation giving "priority to poor community, or to the poorer people in a community" (HMG 1988:10; sec112.4). The belief of this new Act was that giving formal communal property rights to local user

groups provides them with an incentive to manage and extraction of fuelwood, fodder, and other forest products in a sustainable and equitable manner and community welfare will increase as a result of an increase in forest resources and halting degradation. Thus, since then the potential of community forestry management by people participation to secure basic needs for local people and to reduce rural poverty by improving the well being of poor is frequently advocated in Nepal and elsewhere. Although, the conservation or vegetation cover (bio-physical condition) of forest resources are found remarkably improved since the forest resource management regime shifted from state to local community participatory management. But many noted scholars on commons have indicated that equitable distribution of forest benefits within the socio-economically diverse rural community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated (Garner, 1997; Adhikari, 1996, 2002a, 2003; Malla, 2000; Springate-Baginski *et al.,* 1999; Richards *et al.,* 1999). They argue that the restriction posed on the collection of various non-timber forest products after the institutional change actually hurt poorer households whose livelihoods were traditionally closely linked to the collection of these forest products.

Thus, despite having the most pioneering forestry policy in place to promote community-based forest resource management, the community forestry in Nepal is said to be unable to reduce rural poverty and provide a significant contribution to the livelihood of poor and marginalized people. The main reason of community forestry not to be poverty responsive may be the basic policy objective remains only the fulfillment of subsistence needs and its failure to take into account well being benefit approach for sustainable use and equity of forest resource distribution within the rural poor communities (Dahal, 2003).

6.3 Provision Rules on Forest Products Harvesting and Distribution

Among the sixteen CFUGs selected for the study, two community forest user groups (CFUGs) are smaller and remaining CFUGs are bigger than the national average of 73 ha (CPFD database, 2000). Most CFUGs cover two common forest types in study area: forests dominated by *Pinus roxburghii*.and mixed forests of *Schima-Castanopsis* along with *Alnus.* Some of the general rules based on field observation that are common to most CFUGs regarding forest harvesting and distributional processes considered in this study are discussed below.

This section summarizes the general rules of distribution patterns of rules regarding access to different type of forest products under community forest management at the local level. This is followed by summary statistics presented detail in Annex table B-1 to B-13 for the surveyed households.

Following tables show that most households from all the forest user groups restrict the use of those forest products, which have cash value or are in short supply such as timber. There are strict rules in all the community forest user groups in harvesting green fuel-wood and other green forest products from community forest.

Some groups permit free collection of certain forest products and charge for others. Some groups specify a time for harvesting only green wood (fuel wood and timber) and allow other forest products to be collected free of charge any time of the year. Some forest user groups allow the collection of only dead and dry materials (fallen twigs and branches and leaf litter) and impose a complete ban on the use of other forest products. Many forest user groups will provide additional loads of fuel wood, also free of charge, to local blacksmiths for manufacturing agricultural tools.

6.3.1 Sal Timber

Timber *(Kath)* is an important forest product supplied to construct houses and animal shed according to the need and demand of users. The number of trees for house construction supplied varies depending upon the size of the house and the tree. Nominal amount of fee that the users need to pay to get such timber (*Kath)* from community forest.

Many forest user groups will provide construction timber to households that suffer damage from fire, landslides, earthquakes or other natural calamities; a certain amount of fuel wood for ceremonial use (weddings, cremations or funerals); wood free of charge for public works such as construction of schools or health posts. Following Table 6.4 presents the general rules of distribution of different types of Sal forest products under community forest management, which are common to most CFUGs considered in this study.

Table 6.4

Distributional Rules for Access to Sal Forest Products by Type and Time of Collection

User's Fee Rates of Sal Timber Time of collection

Sal Timber	Free of charge	Nominal charge (NRs in range)	Sale through Auction/tender (NRs in range)	Any time	Specific month
Saw/QF	X	25 - 200	150 (only in FUG)	Most	X
Tham/N	X	10 - 50	50 - 75	Most	X
Garalo/N	X	10 - 50	50 - 75	Most	X
Pool/N	X	10 - 100	70 - 100	Most	X
Valsi/N	X	10 - 50	50 - 75	Most	X
Nidal/N	X	10 - 200	70 - 100	Most	X
Plough/N	X	5 - 10	X	Most	X
Haris/N	X	10 - 25	X	Most	X
Juwa/N	Most	5 -10	X	Most	X

Source: Field Survey, 2003.

The Table 6.4 shows the distributional rules for access to Sal forest products by type and time of collection. Since the user's fee rates of Sal timber *(Kath*) between the forests user groups vary from one to another, so it is presented here in ranges. As per the Table 6.4, among the products of Sal timber, the ranges of user's fee rates vary from one to another product. The highest range of user's fee rates is NRs 25–200 per square cubic feet for the saw timber *(chhirani Kath)* between forest user groups while it is lowest NRs 5–10 per number for the plough and *juwa.* Among the CFUGs, only one CFUG has provision of sale of the saw timber *(chhirani Kath)* through Auction/tender, however it is appears for all other types of Sal timber with significant variation in comparison to the ranges of user's fee rates of different types of Sal timber. Such types of Sal timber sold by the CFUG through Auction/tender mostly benefited rich and high cast households in each CFUG. Timber wood sold to CFUG members at below-market prices is mostly purchased and used by elite members and wealthier households who have greater demand, ability to pay and dominant position in CFUG (Malla, 2000)

In most of the CFUGs, all types of Sal timber as mentioned above are distributed to needy user as and when need basis at any time after the verification and approval of forest executive committee. Sale of different types of Sal timber and Sal firewood from community forest is strictly banned. During field visit, livestock grazing was observed

free in most of the community forests. Any member of CFUG with a major harvesting tool enter into the community forest is strictly prohibited unless such member is allowed to do so by the executive committee of CFUG. The details of distributional rules for access to Sal forest products by type and time of collection is presented in Annex Tables 6- E, 6-F and 6-G.

6.3.2 Non-Sal Timber

Non- Sal timber also is an important forest product supplied to construct houses and animal shed according to the need and demand of users. The number of trees for house construction supplied varies depending upon the size of the house and the tree. Nominal amount of fee that the users need to pay to get the non- Sal saw timber *(chhirani Kath)* from community forest.

Many forest user groups will provide construction timber to households that suffer damage from fire, landslides, earthquakes or other natural calamities; a certain amount of fuel wood for ceremonial use (weddings, cremations or funerals); wood free of charge for public works such as construction of schools or health posts. Following Table 6.5 presents the general rules of distribution of different type of non-Sal forest products under community forest management, which are common to most CFUGs considered in this study.

Table 6.5

Distributional Rules for Access to Non- Sal Forest Products by Type and Time of Collection

User's Fee Rates of Non - Sal Timber Time of Collection

Non-Sal Product	Free of charge	Nominal charge (NRs in range)	Sale through Auction/tender (NRs in range)	Any time	Specific month
Saw/QF	X	5 - 50	X	Most	X
Tham/N	Most	X	X	Most	X
Garalo/N	Most	X	X	Most	X
Pool/N	Most	X	X	Most	X
Valsi/N	Most	X	X	Most	X
Nidal/N	Most	X	X	Most	X
Teka /N	Most	X	X	X	Nov-Dec
Thangra /N	Most	X	X	X	April-June

Source: Field Survey, 2003.

Table 6.5 shows the distributional rules for access to non - Sal forest products by type and time of collection. Since the user's fee rates of only non - Sal timber saw *(chhirani Kath*) between the forest users groups vary from one to another, so it is presented here in ranges such as NRs 5 – 50 per square Q.B.Ft. applied in different forest user groups. There is no provision of any non-Sal timber product sale through Auction/tender. Most of the non-Sal timber products such as tham, *garalo, pole, valsi* and *nidal*, are distributed free of charge as per the need of user households at any time after the verification and approval of forest executive committee whether he/she is needy user or not.

Teka and *thangra* are distributed free of charge as per the need of user households mainly on dry season from November to December and April to June respectively. Sale of different types of non-Sal timber and non-Sal firewood from community forest is strictly banned. During field visit, livestock grazing was observed free in most of the community forests. Any member of CFUG with a major harvesting tool enter into the community forest is strictly prohibited unless such member is allowed to do so by the executive committee of CFUG. The details of distributional rules for access to non- Sal forest products by type and time of collection is presented in Annex Tables 6-H and 6-I.

6.3.3 Firewood

Harvesting and distribution of fuel wood, especially green fuel wood, is the main concern of most forest user groups (Timala, 1999). The following Table 6.6 presents the distributional rules for access to firewood forest products by type and time of collection.

Table 6.6

Distributional Rules for Access to Firewood Forest Products by Type and Time of Collection

User's Rates of Firewood Distribution Time of Collection

Firewood Products	Freeof charge	Nominal charge (NRs in range)	Salethrough Auction/ tender (NRs in range)	Any time	Specific month
Dry wood/ Head load	Most	X	X	Most	X
Greenwood/ Head load	Some	5 - 25	X	X	March-April
Jhikra/Head load	Most	X	X	Most	X
Tree branch/Head load	Most	X	X	X	Feb - March

Source: Field Survey, 2003.

According to Table 6.6, user households are not allowed to collect all types of firewood products throughout the year. In most of the study sites, green cut wood (*Kacho Daura*) is distributed once a year from March to April after the major thinning and pruning

operation. This is a feasible time to undertake various forestry operations (i.e., bush cutting, thinning, and pruning) and cutting of firewood, since it corresponds to reduced agricultural activities. This period is also good for drying green firewood given that it is the hottest period of the year. During this time, user households participate in various forms of forestry activities. In addition, Unwanted inferior species of trees and shrubs such as *Bhogate* (*Maesa microphylla*), *Dhursul* (*Colebrokia oppositifolia*) are cut, chopped into burnable sizes and distributed to local user households. In most FUGs, dry wood or dead branches & fallen twigs (*Sukay Daura*) and plant residue (*Jhikra*) are collected free of cost throughout the year and its use is not restricted. However, user households are not allowed to chop standing trees (green and dry) and gather firewood from CF as and when they wish. Green firewood harvesting from green tree cut is a collective activity and households are required to pay Rs1 to Rs 6 per green tree cut up to two trees as a fee to the CFUG. There is no provision of any firewood product sale through Auction/tender. Sale of any types of firewood products from community forest is strictly banned. The time to collect fallen and decayed products and grass from community forest is not strictly regulated. The details of distributional rules for access to firewood forest products by type and time of collection is presented in Annex Tables 6-J and 6-K.

6.3.4 Green Grass

Under the grass ground, green grass/cutgrass and tree fodder *(Hariyo ghans)* refers to all non-woody herbaceous plants cut for livestock feeding. The following Table 6.7 presents the distributional rules for access to green grass forest products by type and time of collection.

Table 6.7

Distributional Rules for Access to Green Grass Forest Products by Type and Time of Collection

User's Rates of Green Grass Distribution Time of Collection

Green Grass Products	Free of charge	Nominal charge (NRs in range)	Sale through Auction/tender (NRs in range)	Any time	Specific month
Cutgrass/ Head load	Most	X	X	X	July. – Nov.
Tree fodder/ Head load	Most	X	X	Most	X

Source: Field Survey, 2003

According to Table 6.7, cutgrass/ground grass and tree fodder are allowed free of cost to most user households. There is no provision of any green grass product sale through Auction/tender. Among the two, the cutgrass/ground grass is allowed to collect only from July to November in a year and the tree fodder is collected throughout the year without strict restriction. During dry season, crop residues from the preceding year have been exhausted and less grass fodder is available on private land or in the CF due to very low rainfall and relatively dry weather. Though everyone who is a legitimate user is allowed to collect tree and grass fodder from a CF, poorer households' requirements for fodder and grass is always minimal or zero compared to those of the less poor. Households that do not use grass and tree fodder are not allowed to harvest for commercial purposes. In other words, there is no provision of transferable property rights. The details of distributional rules for access to green grass forest products by type and time of collection is presented in Annex Tables 6-L and 6-M.

6.3.5 Leaf Litter

Leaf litter is important to the village level subsistence agricultural economy because they remain as a major source of compost fertiliser in order to maintain soil productivity. Under the leaf litter, use of green leaf litter and dry leaf litter by most households were observed in the study area. Green leaf litter *(Syaula)* comes from a wide variety of trees and bushes on community forests. An alternate to chemical fertilizers most households have a common practice to collect dry leaf litter (*Sottar) as* well as green leaf litter *(Syaula)* from community forest for animal bedding and mulching to maintain soil fertility. Dry leaf litter (*Sottar) is* harvested by hacking and is gathered as litter. Most of the households use bedding materials for animal such as combination of dry leaf litter, non-palatable green vegetative material, crop residues and remains of uneaten fodder in the study area. *Khar* and *Babio* are the green grass types of forest products and they are collected in the dry form for house roof and making rope respectively. The major source of all these animal-bedding materials is community forests including shrub lands and grasslands. Table 6.8 presents the distributional rules for access to green leaf litter and dry leaf litter forest products by type and time of collection.

Table 6.8

Distributional Rules for Access to Leaf Litter Forest Products by Type and Time of Collection

User's Rates of Leaf Liter Distribution Time of Collection

Leaf Litter Products	Free of charge	Nominal charge (NRs in range)	Salethrough Auction/Tender (NRs in range)	Any time	Specific month
Green leaf/Head load	Most	X	X	X	June - Sep.
Dry leaf/ Head load	Most	X	X	Most	X
Khar/Head load	X	5 - 40	X	X	Nov.- Dec.
Babio/ Head load	X	5	X	X	Nov.- Dec

Source: Field Survey, 2003.

Table 6.8 shows that green leaf litter *(Syaula)* is collected free of cost mainly on dry season from June to September. *Bhogate* (*Maesa microphylla*), *Dhursul* (*Colebrokia oppositifolia*), *Simali* (*Vitex negundo*) and *Angeri* can be collected free of cost as green bedding and/or composting materials. Many user groups allow collecting and gathering dry leaf litter (*Sottar)* free of cost without restriction. Although the actual harvested quantities of *Sottar may* be vary among the CFUGs and different wealth ranked groups of households in the study area. *Khar* and *Babio* harvesting from community forest is a collective activity and households are required to pay Rs 5 per head load for *Babio* and Rs 5 to Rs 40 per head load for *Khar* as a fee to the CFUG. Both of these two *Khar* and *Babio* are allowed to collect only from November to December in a year. There is no provision of any leaf litter including *Khar* and *Babio* forest product sale through Auction/tender. Sale of any types of these products from community forest is strictly banned. The details of distributional rules for access to leaf litter forest products by type and time of collection is presented in Annex Tables 6-N and 6-O.

6.3.6 Fruits

Fruit is an important forest product as a reserve or safety net providing both subsistence and income in times of crop failure, shortfall, unemployment or other emergency or hardship, or to meet exceptional basic needs. Forest fruits are widely used to help meet dietary shortfalls during particular seasons in the year. It is related to reduce vulnerability. Energy-rich forest fruits in local forests such as *Bayar, Bel, Bhalayo, Jamun* and *Fadir, Katus, Sarifa, Satibayar* and *Trifala (Harro, Barro and Amala)* are important in meeting dietary shortfalls as well as especially in emergencies such as

floods, famines, droughts and wars. Table 6.9 presents the distributional rules for access to forest based fruit products by type and time of collection.

Table 6.9

Distributional Rules for Access to Forest's Fruit Products by Type and Time of Collection

User's Rates of Fruits Distribution Time of Collection

Fruit Products	Free of charge	Nominal charge (NRs in range)	Sale through Auction/tender (NRs in range)	Any time	Specific month
Bayar/KG	Most	X	X	X	Oct-Dec.
Bel/KG	Most	X	X	X	May-Jun
Bhalayo/KG	Most	X	X	X	June-Aug.
Jamun/Fadir	Most	X	X	X	July-Aug
Kattus/KG	Most	X	X	X	May-Aug
Sarifa/KG	Most	X	X	X	Sep-Nov
Satibayar/KG	Most	X	X	X	Dec-Jan
Trifala/KG	Most	X	X	Most	X

Source: Field Survey, 2003.

Table 6.9 shows that all types of fruit are allowed free of cost to most user households. Most households are free to collect different types of fruits as mentioned above as per the production seasons rather than time schedule of CFUG. *Bayar* is allowed to collect from October to December in a year. Bel is allowed to collect from May to June in a year. *Bhalayo* is allowed to collect from June to August in a year. *Jamun/Fadir* is allowed to collect from July to August in a year. *Katus* is allowed to collect from May to August in a year. *Sarifa* is allowed to collect from September to November in a year. *Satibayar* is allowed to collect from December to January in a year and *Trifala (Harro, Barro and Amala)* is allowed to collect at any time.

In most CFUGs, users are prohibited from cutting fruit trees and certain other special herbs related species. There is no provision of sale any types of forest fruit products through Auction/tender. Most user households could use these fruits to fulfill household level subsistence needs only and sale of any types of these products from community forest is strictly banned. The details of distributional rules for access to fruit forest products by type and time of collection is presented in Annex table 6-P and 6-Q. No any CFUG employs a forest watcher *(Ban Pale).*

In summary, two major types of forest products – consumption based and production based forest products, observed in the study area. Fuel-wood and timber are consumption based forest products that households directly use to fulfill the subsistence needs. Other biomass products such as green fodder, green cut grass and green/dry leaf litter are production based forest products that households use them indirectly as input to complement other productive assets: paddy fields or livestock. This means that the level of harvesting of production-based biomass forest products is an increasing function of agricultural land holding size and the number of livestock ownership. Most users' rights of forest products are non-transferable. Cash income earned by community forest is the common income and not distributed among the users. Moreover, users are not allowed to sell their private share of the produce in the market. Thus, there is a strong argument to be made that CF in Nepal is incentive-incompatible. Traditionally, poorer households were dependent more on local forests for firewood and other NTFPs. Conversely, with the introduction of usufruct property right regimes in forestry, the access of poorer households to forests has been reduced due to a restrictive management regime that yields negative benefits to poorer income groups compare to non-poor income groups. On the other hand, such restrictive management regime of community forest discourages NTFP collection, charcoal making and other activities in which occupational households (i.e., blacksmith, local liquor makers, etc.) were traditionally involved.

Thus, the above discussion concludes that the existing distributional rules of community forestry in Nepal is said to be unable to distribute the common property forest resources and provide a significant contribution to the livelihood of poor and marginalized people. The main reason of community forestry not to be poverty responsive may be the basic policy objective remains only the fulfillment of subsistence needs and its failure to take into account well being benefit approach for sustainable use and equity of forest resource distribution within the rural poor communities.

6.4. Sources of Income and Expenditure Pattern of CFUG

6.4.1 Income of Forest User Group

Community forestry is frequently advocated from income prospective in Nepal. The general belief is that it has potential of local development through fund raising to improve the well being of local people on behalf of forest user groups. Table 6.10 shows to what extent this notion has been practiced in the context of community forestry in rural Nepal. The income generation activities by forest user's groups vary widely and depend on the size, condition and type of forests, the level of forest utilization, the type and proximity of markets and the kinds and practices of economic activities.

Most local community forest groups in the study area obtain income from very limited sources. Government grants, support from Village Development Committee, sale of different types of forest products, application fees, interest earning, punishment fees, membership fees were the major sources of income for most CFUGs. Income from the membership fees, sale of timber, NTFPs and other products is directly deposited in community funds. Most CFUGs used these funds for lending to earn interest, and very few CFUGs used these funds for community development works. Among such development activities are construction of local primary English (boarding) school buildings and walking-path maintenance in the village and other related works. Realizing the benefits generated from investments in primary English (boarding) school buildings is again a function of the socioeconomic influence of high class and rich income households.

Overall, however, the cash income of most forest user groups is very low. Forestry-based income generation activities have potential of local livelihood improvement and sustainable management of local commons. However, it is obvious from the following table that greater portions of the income of most users' groups are obtaining from the sources of non-forestry activities rather than the sources of forestry activities. The Table 6.10 shows the major sources of total annual income and average annual income of entire CFUGs in the study area.

Table 6.10

Income sources of FUG by Type

Type of Sources	Total Amount (in NRs)	Average CFUG Income
Government Grant	52,500	3,281.2
VDC Support	1,500	93.7
Sale of Forest Product	72,050	4,503.1
Application Fees	8,386.5	524.1
Interest from lending	32,656	2,041.0
Punishment Fees	5,975	373.4
Membership Fees	51,752	3,234.5
Others (donation, NGO/INGO support etc.)	0.0	0.0
Total Income	224,819.5	14,051.2

Source: Field Survey, 2003

According to Table 6.10, the average annual income for 16 forest user groups was NRs 14, 051.2.This annual average income of almost all of the forest user groups was lower than the annual average household income (NRs 37,722) of 16 forest user groups in the study area. Most forest users' groups are obtaining the smaller portions of the income (32.0 percent of total income) from the forestry sources such as sale of different forest products. While they are obtaining the greater portions of the income (68.0 percent of total income) from the non-forestry sources such as government grant, VDC support, application fees, interest from lending, punishment fees and membership fees. The detail of income structures of all forest user groups is presented in Annex Table 6 – R.

6.4.2 Expenditure Patterns of FUG

It is frequently advocated that community forest groups are investing a significant amount of fund in local development such as school building and support, health post building and support, drinking water supply and sanitation, village road construction etc. and hence they should be acknowledged as a development engine at local level. However, the data on areas of investment and expenditure by the most CFUGs shows that this is only partially true in the context of study area. The annual expenditure patterns of the entire CFUG from the study area are presented in Table 6.11.

Table 6.11

Expenditure Patterns of FUG by Area

Area of Expenditure (Total Amount and Percentage) (in NRs)

Lending	92,833	41.3
Office Expense	13,324	5.9
School	13,500	6.0
Drinking water	6,000	2.7
Pati Maintenance	10,000	4.4
Nursery	2,000	0.9
Fair control	500	0.2
Others* (Sale of Forestry Instruments etc.)	28,500	12.7
Total Expenditure	78,094	34.7
Total Saving	146,725.5	65.3

Source: Field Survey, 2003

According to Table 6.11, most CFUGs were investing average 41.3 percent of their fund on lending area with 24.0 percent interest rate followed by 12.7 percent expenditure on sale of forestry instruments, 6.0 percent on school and Office Expense, 4.4 percent on pati (public meeting hall) maintenance. There is little expenditure on forest protection and management which is so low than the mandatory level mentioned in Forest Act 1993 and Forest Regulation 1995 (at least 25.0 percent of total fund). The expenditure on school and training, which are the basic activities to develop human resource of the users' family members, is surprisingly very low. Out of total income, only average 34.7 percent were spending in different activities and out of 65.3 percent saving of the total fund, very big fraction were found to be diverted on giving somebody the use of fund to reap high rate of interest. The detail of expenditure patterns of all forest user groups is presented in Annex Table 6-S.

Some forest user groups have used their fund to pay salary of nursery staff, forest watchers and general administration and Operating costs. Many community forest user groups found not used their fund of money on village welfare and development activities, although generally positive, do not necessarily benefit all the forest user group members, especially those who are most in need, and some activities may only benefit poorer members in the long term. For example, some forest user groups have built schools, without providing the support to enable children of poorer households to attend school. To date, little effort has been made to use group funds for the benefit of poorer households. However, better information can lead to better planning decisions. For example, a forest user group committee in the western hills region is applying the results of a research project which defined household categories based on wealth ranks (Branney, Neupane, & Malla, 2000) in order to use part of the group fund to lend to people from the poorest group with a low interest rate and without collateral.

6.5 Provision rules on Punishment Conduct

All the CFUGs of the study area have their own institutional mechanism regarding the extraction and provision rules, detection and graduated sanctions, collective-choice arrangements, conflict-resolution mechanisms and monitoring systems. Forest user's assembly is the highest authority, which makes decisions as per the constitution of the CFUG regarding the over all rules of community forest management and governance including provision rules on punishment conduct. The five-year operational plans, defines user rights, and determines rules for forest product gathering, distribution and punishment should be sanctioned by the general assembly. The executive committee of the CFUG implements decisions as per the direction of assembly.

All CFUGs have written norms about penalties, fines and graduated sanctions for those who violate the rules and regulations of CF. Since the operational rules of penalties, fines and graduated sanctions of CFUGs vary from one to another and it is difficult to document them all. Generally, conflicts related to illegal collection of forest products, and cutting of trees is resolved through cautioning the offender if it is a first-time offence. If the same offence is repeated a second time, the cutting and felling tools are confiscated. If the offender repeats the same action a third time, the CFUG takes strict actions such as cash fines and some sort of social exclusion. Any member of CFUG with a major harvesting tool enter into the community forest is strictly prohibited unless such member is allowed to do so by the executive committee of CFUG.

Table 6.12 presents the number of offenders and types of penalty of each CFUG regarding illegal activities in the forest area.

Table 6.12

Number of Offender and Type of Penalty by Activity and CFUG

Illegal Forestry Activities and Offenders

	Fair offender		Harvesting offender		Timber cutting offender		Farming offender		Grazing offender		Absentee offender	
CFUG	N#	Penalty	N	Penalty	N	Penalty	N	Penalty	N	Penalty	N	Penalty
Panchakanya	0	0	0	0	1	NRs.400	0	0	0	0	0	0
Dakshinkali	1	Cautioning	0	0	0	0	0	0	0	0	0	0
Arunganga	0	0	0	0	1	NRs.500	0	0	0	0	0	0
Oiputang	0	0	0	0	0	0	0	0	0	0	0	0
Jalasinghadevi	0	0	2	NRs.40	0	0	0	0	22	NRs.8	4	NRs.25
Khorsane	0	0	0	0	0	0	1	NRs.300	0	0	0	0
Shivaratrighat	0	0	0	0	0	0	0	0	0	0	0	0
Barnebelayate	0	0	0	0	0	0	0	0	0	0	0	0
Tarebhir	0	0	0	0	0	0	1	Cautioning	0	0	0	0
Salleri	0	0	0	0	0	0	0	0	0	0	0	0
Salghari	0	0	4	NRs.50	0	0	0	0	0	0	3	NRs.50
Arunodaya	0	0	9	NRs.125	0	0	0	0	0	0	5	NRs.50
Rupadhari	2	Cautioning	0	0	1	NRs.300	0	0	3	Cautioning	3	NRs.25
Chhyangripasini	NA*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chhabar	0	0	0	0	0	0	0	0	0	0	0	0
Bancharedanda	2	Cautioning	0	0	6	NRs.100	0	0	0	0	20	NRs.20
Total	5	0	15	NRs.1405	9	NRs.1800	2	NRs.300	25	176	35	NRs.975

Source: Field Survey, 2003.
Note: # = Number of offenders
* = Not Available

Table 6.12 shows that conflicts related to illegal forestry activities are resolved through imposing penalty and providing cautioning the offenders. The operational rules of penalties and fines of each CFUGs vary from one to another. The penalty fee is higher for timber cutting offence in Arunganga CFUG and it is lower for grazing offence. Few of the CFUGs were applied the cautioning measure to fair offender and grazing offender. But cash is necessary to pay fines for the illegal harvesting of different forest product including timber-cutting offenders and absentee offenders. In the entire CFUGs of the study area, the total number of absentee offenders is high (35) from five CFUGs followed by grazing offenders (25) from two CFUGs, forest product harvesting offenders (15) from three CFUGs, timber-cutting offender (9) from four CFUGs and fair offender (5) from three CFUGs respectively. The total number of farming offender, i.e. illegal land cultivation in forest area, is only two in the whole study area. All these indicates that most user households in the study area are following the rules and regulations of CF as well as adopting the norms about penalties, fines and graduated sanctions for those few offenders who violate the rules and regulations of CF.

6.6 Monitoring Practices of CFUGs

The existing monitoring practice to have each of community forest user group in the study area gives rise to a fundamental question regarding the widespread objectives of community forestry in Nepal: Is the present monitoring system of community forest management focusing to monitor conservation impact of forest cover or livelihood impact of the poor and the disadvantaged groups? Yet, in the saying of forest agencies i.e. DFO, there still appears to be a commitment to continue both with an integrated approach. But the practical experiences and evidences regarding existing monitoring practice in the study area show that most CFUG have lack monitoring by the DFOs and if they were visited to few of them only emphasized the conservation objective i.e. forest cover. Even though unit level forest agencies i.e. *Ilaka* forest renege post was emphasized the budget and conservation objective. Only the CFUGs were concerned the community development objective focusing the use and management of CF. However, there is no apparent monitoring practice from both the forest agencies and community on livelihood impact of the management of CF to the local poor and the disadvantaged groups. The following Table 6.13 shows the existing monitoring practices of CF by DFO, Unit Forest Office (*Ilaka*) UFO and FUEC including the time and area of interest in the study area.

Table 6.13

Visiting Time and Area of Monitoring by DFO, UFO and FUEC

Agency, Visiting Time and Area

CFUG	DFO		UFO		FUEC	
	Time	Area	Time	Area	Time	Area
Panchakanya	0	0	2	Budget & forest cover	5	Use & management
Dakshinkali	0	0	3	Budget & forest cover	6	Use & management
Arunganga	0	0	2	Budget & forest cover	4	Use & management
Oiputang	0	0	3	Budget & forest cover	4	Use & management
Jalasinghadevi	1	Forest cover	2	Budget & forest cover	6	Use & management
Khorsane	0	0	2	Budget & forest cover	5	Use & management
Shivaratrighat	0	0	3	Budget & forest cover	4	Use & management
Barnebelayate	0	0	2	Budget & forest cover	4	Use & management
Tarebhir	0	0	1	Budget & forest cover	3	Use & management
Salleri	0	0	3	Budget & forest cover	5	Use & management
Salghari	1	Forest cover	2	Budget & forest cover	4	Use & management
Arunodaya	0	0	3	Budget &forest cover	4	Use & management
Rupadhari	NA*	NA	NA	NA	NA	NA
Chhyangripasini	NA	NA	NA	NA	NA	NA
Chhabar	0	0	3	Budget & forest cover	4	Use & management
Bancharedanda	0	0	5	Budget & forest cover	6	Use & management

Source: Field Survey, 2003

Note:* = Not Available

According to Table 6.13, out of total sixteen CFUGs, only two CFUG- Jalasinghadevi and Salghari were visited only one time in a year by DFOs about forest cover and budgetary condition of CFUG. Most CFUGs were visited one to five times in a year by UFOs (Unit Forest Office i.e. *Ilaka* forest renege post) about budget and forest cover only. The forest user executive committee themselves were visited four times to six times about the use and management of CF in a year. Table 6.13 indicates that only the local FUECs were concerned about the forest conservation, sustainable utilization of forest resources focusing the overall participatory local development while for the

Department of Forest (DOF's) and the UFOs monitoring of the livelihood impact of community forest management is not an area of their explicit interest.

The main reasons behind this are that despite policy emphasis on conservation and local development goal in place in CF, there is no real monitoring practice among the community forest users that actually incorporates the livelihood impacts of the weaker sections of the community. Forest management and distributions systems are mostly controlled by the elites in the community, and community forestry extension input alone may not be expected to reorient the entire socio-political structure. However, the existing opportunities to change the attitude of the forest agencies and community leaders and building their capacity to understand the dynamic links among 'CFUG decisions', 'human actions', 'ecological processes of the forests' and the 'equity in forest products sharing'. Moreover, it is necessary to change of the Department of Forest (DOF's) perception of good CFUG which is dominated by criteria such as good forest and good bank balance, and hence monitoring of the livelihood impact of community forest management is not an area of its explicit interest.

Thus, even with supportive forest regulation 1995 in place, community forestry monitoring requires changes in the orientation of forestry department to work effectively with communities with the training of personnel and financial resources. Forestry extension activities through community forest is being matured in the area of forestry sector in Nepal, yet to work effectively with local community's forest user groups requires a retooling of forestry staffs to encourage a shift in orientation from perceiving people as the problem to as part of the solution. The role of the forest officer is limited to assist the CFUGs only in the development of an Operational Plan in Nepal. Given the small size of many of the forest areas, a forestry officer may be overwhelmed with the development, approval, and monitoring of a large number of Operational Plans that in total cover only a small area.

6.7 Forest Act and Forest Regulation over Forest Resource Management in Nepal

The past decade has witnessed that Forest Acts and Forest Regulations over forest resources have frequently changed in Nepal. Under the Forest Nationalization Act of 1957, a very controversial step was taken in the history of forest management in Nepal. Huge tracts of forests previously managed as private and common property were brought under the state control. However, there is a huge debate on forest nationalization and the deforestation hypothesis in Nepal (Ives & Messerli, 1989; Fisher, 1990). Many scholars believe that local communities throughout the country reacted negatively to forest nationalization believing that their traditional rights of access and use had been curtailed

(Bromley & Chapagain, 1984; Bromley, 1991). Consequently, this act increased the rate of deforestation as villagers hurried to convert affected lands into agricultural use to exempt them from the transfer (Bromley, 1991). In response, the government introduced another Forest Act of 1961, which was more focused on forest administration. This Act, which further consolidated the notion of forest nationalization, was amended in 1978 to include different forest management regimes such as *Panchayat* Forests, *Panchayat* Protected Forests, Private Forests, Leased Forests and Religious Forests. By the mid 1970s, it was clear that local people had to be involved in every aspects of forest management. As a result, the new and far-sighted Community Forestry Regulation and Decentralization Act were passed in 1982. The Master Plan for Forestry Sector, 1988) spells out a comprehensive policy statement for CF management and emphasizes that control of forest should be turned over to community forest user groups (CFUGs). As a result, Forest Act of 1993 and Forest Rules of 1995 came in place with an increasing emphasis on community-based resource management under the communal collective property regimes to have a focus on poverty alleviation giving "priority to poor community, or to the poorer people in a community" (HMG 1988:10; sec112.4). Presently, the Forest Act 1993 and the Forest Regulations 1995 are governing the functioning of CF in Nepal. The act defines the main policies and the regulations at operational level. According to these act and regulations, the land managed under CF belongs to the state and the land use rights and forests are owned and managed by the users (HMG 1995a). Important characteristics of formal CF Act and Regulation are:

- Land ownership remains with the state, but the land use rights along with the forest resources except wildlife products, soils, sands, etc. belong to CFUGs.
- Each member of the CFUG is a co-owner and has equal rights over the resources, and 'outsiders' are denied access.
- CFUGs will not be affected by political boundaries
- State acts as a facilitator by providing technical supports and advice to users.
- There is provision of rules on detection and graduated sanctions
- There is provision of rules on collective-choice arrangements
- There is provision of rules on conflict-resolution mechanisms
- There is provision of rules on decision making and implementation

The belief of this new Act was that giving formal communal property rights to local user groups provides them with an incentive to manage and extraction of fuelwood, fodder, and other forest products in a sustainable and equitable manner and community welfare will increase as a result of an increase in forest resources and halting degradation. Thus,

since then the potential of community forestry management by people participation to secure basic needs for local people and to reduce rural poverty by improving the well being of poor is frequently advocated in Nepal and elsewhere. Although, the conservation or vegetation cover (bio-physical condition) of forest resources are found remarkably improved since the forest resource management regime shifted from state to local community participatory management. But many noted scholars on commons have indicated that equitable distribution of forest benefits within the socio-economically diverse rural community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated (Garner, 1997; Adhikari, 1996, 2002a, 2003; Malla, 2000; Springate-Baginski *et al.,* 1999; Richards et al., 1999). They argue that the restriction posed on the collection of various non-timber forest products after the institutional change actually hurt poorer households whose livelihoods were traditionally closely linked to the collection of these forest products.

Thus, despite having the most pioneering forestry policy in place to promote community-based forest resource management, the community forestry in Nepal is said to be unable to reduce rural poverty and provide a significant contribution to the livelihood of poor and marginalized people. The main reason of community forestry not to be poverty responsive may be the basic policy objective remains only the fulfillment of subsistence needs and its failure to take into account well being benefit approach for sustainable use and equity of forest resource distribution within the rural poor communities (Dahal, 2003).

CHAPTER 7

7 VICTIM HYPOTHESES OF RURAL POVERTY AND FOREST RESOURCES

According to victim hypothesis, poor people are more directly dependent on biological resources for their livelihood than richer people are. Loss of flora and fauna is thus relatively more costly to poorer segments of society. Furthermore, poor people often are compelled to settle close to these resources commonly found in open access areas, to be exploited at family-labor costs only. People particularly dependent on biological resources include:

i. Small-scale farmers, who often derive additional sources of income from wild fruits, nuts, berries, herbs, medicinal plants, bush meat and roots.

ii. Trans-human pastoralists, who derive essential nutrients from similar wild flora and fauna in marginal areas such as dry lands, and

iii. Artisanal fisherman who derive a variety of coastal and marine resources such as shells, seaweed, coral and fishes, which provide food, building material, ornaments, cultural artifacts and cash income.

The rural poor are heavily dependent upon natural resources for their livelihoods. It has long been recognized that the poor in rural areas have a close relationship to the natural resources for their livelihood and survival strategies, and that their lives are greatly affected by the way others around them use environmental resources. The World Bank has recently estimated that one quarter of the world's poor depend directly or indirectly on forests for their livelihood (World Bank, 2000a). Thus, According to victim hypothesis, the reliance by the poor people on access to natural resources is still key.

As stated in chapter one, the fundamental intend of this study is to verify the victim hypothesis into Nepal's community forestry by investigating to what extent is the reliance by the poor people on access to natural community forest resources or to what extent community forestry has contributed to the household level welfare (income) of poor people. For this purpose, this section provides empirical evidences to verify the victim hypothesis whether the poor people are more dependent on natural common property forest resources than non-poor for their livelihoods in the study area.

To examine the theoretical notion of victim hypothesis empirically into the Nepal's community forestry, this section presents the data on quantity of different types of forest products harvesting from community forests by heterogeneous caste/ethnic and income groups of households and benefits (monetary value) estimation of these forest products

to show the differential distributional impacts on the four major caste/ethnic group as well poor and non-poor class of households in the context of study area.

7.1 Types of Forest Product Harvesting of Community Forests

Altogether, four major caste/ethnic groups and three income groups of households in the study area have used nine items of forest products from community forests. Under the grass item, they used tree/shrubs fodder and cut green grass, under the litter item, they used green and dry leaf litters and under the timber item, they used sal and non-sal timber. In addition, some households are collecting different types of fruits and herbs from CF but it is not included here due to insignificant amount. Table 7.1 portrays gross and per household amount of forest product harvesting from CF.

Table 7.1

Table 7.1 depicts that harvesting the total and average per household head load of dry and green leaf litter by different caste/ethnic groups and income groups of households in the study area is higher (37,286 and 93) followed by fodder and green grass (29,040 and 73) and firewood harvesting (18,496 and 46) respectively. Similarly, the total and average per household harvesting number of Small Pole (*Teka*) is higher (7,304 and 18) followed by plough (399 and 3) and timber both in cubic feet (749 and 2) respectively.

7.1.1 Types of forest products harvesting from CF per Year by Caste/Ethnic Groups

Details of gross and per household amount of forest product harvesting from CF per year by each CFUG are presented in Table 7.1. Altogether, nine items of forest products from community forest have been used by 12 CFUGs and seven items of forest products from community forest have been used by four CFUGs. These four CFUGs with total 81 households are the timber not used CFUGs. Table 7.2 shows the total and per household quantity of different forest products harvested from community forests by different caste/ethnic groups in the study area.

Table 7.2

Table 7.2 illustrates that on an average, total harvesting of most forest products from CF is high for *Brahmin/Chhetri* households followed by *Janajati*, *Newer* and *Dalit* households respectively. At the aggregate level, this indicates that *Brahmin/Chhetri* and *Janajati* households compete similar way for the forest product. Similarly, *Newer* and *Dalit* households compete similar way for the forest products. If it looks at the household level in relation of household proportion to total household, the statistics appeared different. Table 7.3 highlights it in detail.

Table 7.3

Per Household Quantity of Forest Products Harvested by Types and Caste/Ethnic Groups

Caste/Ethnic Groups

Forest Products	*Dalit* (N#=43)	*Janajati* (N#=156)	*Newer* (N#=42)	*Brahmin/Chhettri* (N#=156)	Total Average
Fuelwood (Head Load*)	50	48	54	42	46
Fodder & Cut Grass (Head Load*)	66	64	75	82	73
Green & Dry Litter (Head Load*)	87	77	94	111	93
Sal & Non-Sal Timber (Cubic Feet)	1	3	3	1	2
Plough (*Haris & Juwa*) (Number)	2	2	3	3	3
Pole (Tree Branch) (*Teka*) (Number)	15	17	18	21	18

Source: Field Survey, 2003.

Number of Households

*One Head Load equivalent 45 to 50 Kg.

Table 7.3 shows that per household harvesting of fuelwood is higher for *Newar* households (54 head load) followed by the *Dalit* (50), *Janajati* (48) and the *Brahmin/Chhetri* (42) respectively. Similarly, per household harvesting of fodder and cut grass is higher for the *Brahmin/Chhetri* households (82) followed by *Newar* (75), Dalit (66) and the *Janajati* (64) respectively. Likewise, per household harvesting of green and dry leaf litter is higher for *Brahmin/Chhetri* households (111) followed by *Newar* (94), *Dalit* (87) and the *Janajati* households (77) respectively. Per household harvesting of Sal and non-Sal timber is equally higher for the *Janajati* and *Newar* households (3 and 3) it is equally lower for *Brahmin/Chhetri* and *Dalit* households (1 and 1 cubic feet).

This means that different forest products harvested or obtained is not positively related with the degree of caste/ethnic groups (high and low caste/ethnic groups). Instead of, it may be positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than the degree of caste/ethnic groups. Because *Dalit* households are harvesting more of those forest products that are less importance in agricultural farming, i.e. fuelwood because they have no sufficient agricultural land and livestock holding. Conversely, *Brahmin/Chhetri* followed by *Newar* households is harvesting more of agricultural and livestock related forest products, i.e. green and dry leaf litter, fodder, and cut grass because they have relatively large size of agricultural land and livestock holding. However, the *Newar* households seem more harvesters of commons and the *Janajati* households seem less harvester of commons even than *Dalit* households. Thus, household level harvesting of CPR from CF in physical terms, i.e. head load, number or cubic feet between high and low caste/ethnic groups seems irrelevant.

7.1.2 Types of Forest Products Harvested from CF by Income Groups

Table 7.4 shows the total and per household quantity of different forest products harvested from community forests by different income groups in the study area.

Table 7.4

Total Quantity of Forest Products Harvested Per Year by Types and Income Groups

Forest Product	Income Groups							
	Rich		Medium		Poor		Total	
	Total	Percent	Total	Percent	Total	Percent	Total	Percent
Firewood (Head Load*)	5,312	28.7	6,848	37.0	6,336	34.3	18,496	100
Fodder & Cut Grass (Head Load*)	10,871	37.4	12,459	42.9	5,710	19.7	29,040	100
Green & Dry Litter (Head Load*)	16,398	44.0	17,974	48.2	2,914	7.8	37,286	100
Sal & non Sal Timber (Cubic Feet & Number)	453	60.5	184	24.6	112	15.0	749	100
Plough (*Haris & Juwa*) (Number)	399	39.9	414	41.4	186	18.6	999	100
Pole (*Teka*) (Number)	2,757	37.7	3,116	42.7	1,431	19.6	7,304	100

Source: Field Survey, 2003.

* One Head Load equivalent 45 to 50 Kg.

According to Table 7.4, out of major six types of forest products, total harvesting head load of most forest products, i.e., green and dry leaf litter, fodder and cut grass, number

of small pole, plough and head load of fuelwood (five forest products) from CF is high for middle income households followed by the rich households except fuelwood and poor income households. On the contrary, rich income households are leading to harvest the timber forest product only where as the poor income households are far ahead the rich income households to harvest the firewood forest products. However, it is behind the middle-income households to harvest the firewood forest products. Although, this indicates that the middle-income and rich income households compete similar way for most of forest product except timber and firewood. Similarly, poor income households compete similar way for the firewood forest product only. If we look it at the household level in relation of household proportion to total household, the statistics will be different. Table 7.5 highlights it in detail. In contrast to Table 7.4, Table 7.5 shows those per household harvesting amount of most forest products, except fuelwood, are higher for rich households followed by the middle-income and the poor households respectively.

Table 7.5

Per Household Quantity of Forest Products Harvested By Types and Income Groups

Income Groups

Forest Product	Rich (N#=111)	Middle (N#=143)	Poor (N#=143)	Total Average
Fuelwood (Head Load*)	48	48	44	46
Fodder& Cut Grass (Head Load*)	98	87	39	73
Green & Dry Litter (Head Load*)	148	126	20	93
Sal &Non-Sal Timber (Cubic Feet & Number)	4	1	1	2
Plough (*Haris & Juwa*) (Number)	4	3	1	3
Small Pole (*Teka*) (Number)	25	22	10	18

Source: Field Survey, 2003.

Number of Households.

* One Head Load equivalent 45 to 50 Kg.

According to Table 7.5, among the forest products, per household harvesting of green and dry leaf litter in head load is higher for rich households (148) and middle-income households (126) followed by fodder and cut grass (98 and 87), fuelwood (48 and 48),

number of small pole (25 and 22), number or cubic feet of Sal and non-Sal timber (4 and 1) and number of plough (4 and 3) for the rich and middle-income households respectively. Contrary to this, per household harvesting amount of all these forest products are far less for the poor households. However, per household harvesting head load of fuelwood forest product is higher for the poor households followed by fodder and cut grass (39), green and dry leaf litter (20), number of small pole (10), number or cubic feet of Sal and non-Sal timber (1) and number of plough (41) respectively for the poor households. Per household harvesting of fuelwood is equal for the rich and middle-income households.

It is clear that, poor households are harvesting less per household quantity of CPR than the rich and middle-income households. This means that the poor income group is harvesting far less than what rich and medium income groups are harvesting. It is also clear that although the difference in per household quantity of CPR obtained from CF by rich and medium is not always so different, the poor invariably differs from the other two income groups in this respect. Thus, household level disparity of CPR harvesting and distribution between the income groups seems clear. The reason of low harvesting per household of different forest products, except firewood, for poor household is positively related with the degree of household assets and wealth endowment (agricultural land and livestock ownership). Rich and medium households have relatively more land and livestock than the poor income groups and hence they pull out more agricultural and livestock related intermediate products from CF. Contrary to this, poor income groups of households are harvesting less of fodder and cut grass, green and dry leaf litter, small pole sal and non-sal timber and plough from community forests because they have relatively less land and livestock than rich and middle - income groups and hence they take out little agricultural and livestock related intermediate products from CF. The variation in the forest product harvesting per household is due to the household size variation among the different income groups. Very low level of valuable forest product harvesting per household of all the income groups in all the CFUGs indicates that forestry activities seem to be subsistence oriented rather than enthusiastic attraction. Thus, the basic reason behind the very low level of harvesting per household of forest products in all the CFUGs for all the income groups, particularly for poor income groups, in the study area is likely to be subsistence outlook of existing community forestry policy which may impede forestry activities to go beyond subsistence level. Such an attitude may unlikely to influence the increasing forest productivity and rural poverty reduction.

7.2 Benefits/Value (Income) of Community Forests

Benefits (Gross value/income) of community forests here refers total annual gross income received to be involved in above mentioned forestry activities by all the caste and income groups of households of sixteen different forest users groups in the study area.

As mentioned in methodology section of chapter one, to estimate the economic value of different forest products the market price, barter method and opportunity cost approach were used. Household level benefits derived from community forest by the local users were calculated by valuing the different forest product collected and harvested from forest areas. The economic value of different forest based products such as fuel wood, fodder, green grass, dry litter, green leaf litter, small tree pool for vegetable and timber for plough, house and animal shed construction by local user households were estimated by employing appropriate methods to calculate the value/income of each forest products. In the entire study site, these all are the potential forest products significantly contribute to the local level household economy.

7.2.1 Quantification of Gross Benefits/Value (Income) of Forest Products from Community Forests

Gross benefit (economic value) of firewood is calculated by multiplying the quantity of firewood (per head load (*Bhari*) by the local market price (Rs.35/ per head load). Gross economic value of tree fodder, cut grass, green and dry leaf litter were calculated by multiplying the quantity of each harvested forest products per head load by the barter game prices- Rs.18 /head load, Rs.20/head load, Rs.14/head load, and Rs.18/head load respectively. Gross economic value of tree branch (*Teka*) was calculated by multiplying the quantity of tree branch (*Teka*) by user's price Rs.18/N. Similarly, gross economic values of timber for house and animal shed construction were estimated based on local market price. Gross economic value of Sal timber was calculated by multiplying the cubic feet by local market price Rs 500/cubic feet and non- Sal timber were calculated by multiplying the cubic feet by local market price Rs 150/cubic feet. Gross economic value of other Sal woods-long pole and Small pole-(*Balo, Garalo, Valsi* were calculated by multiplying the quantity by local market price Rs500/N and Rs300/N respectively. Similarly, gross economic value of other non-Sal woods- long pole and Small pole-(*Balo, Garalo,Valsi* were calculated by multiplying the quantity by local market price Rs. 200/N and Rs.100/N respectively. Gross economic value of plough was calculated by multiplying the quantity by local market price Rs.50/N to get the gross total value for each caste/ethnic and income group. All the items of gross economic value from different forest products are added in each case. The gross total value (benefit) obtained by

households were quantified and averaged to represent the gross economic value or benefit per household for each caste and income groups.

7.2.2 Estimation of Net Benefits/Value (Income) of Forest Products from Community Forests

Net income from different forest products refers to revenues/income less cash and imputed costs of labour as well as the cost of tools and equipment and their depreciation cost (Wollenberg & Nawir, 1999; Adhikari, 2003)). So the costs here include labour costs of time directly associated with finding, extracting, processing and transporting the different types of forest products from the forest areas to the house yard and the transaction costs incurred by households. The cost of tools and equipment and their depreciation cost is not included in the cost analysis due to have insignificant share to total cost and difficult to separate from traditional agricultural activities in rural context. Moreover, use of obsolete technology to harvest forest product including simultaneously in farming activities also, modern technology to harvest forest product seems a matter of talk in the rural context. The net income from forest products was, thus, calculated as gross income minus implicated costs, including transaction costs incurred by forest resource user households.

7.3 Total and Average Quantity and Gross Benefit/Value (Income) of Community Forests by Types of Forest Products

Altogether, nine items of forest products from community forest have been used by 12 CFUGs and seven items of forest products from community forest have been used by four CFUGs. These four CFUGs with total 81 households are timber not used CFUGs. Therefore, average per household quantity of timber is calculated for only 318 household for 12 CFUGs. Details of benefit calculation (per households per year, based on sixteen CFUGs) are presented in Annex Table 7-A. Table 7.6 highlights the total and per household quantity and monetary values of benefits (gross value) of different forest products from community forests.

Table 7.6

Benefits Quantification of Forest Product from CF in terms of Gross Monetary Value/Income by Type and CFUG (in NRs)

Quantity and Value

Forest Products	Total		Per Household		Percentage of Total
	Quantity	Value	Quantity	Value	Value
Fire Wood (including dry twigs) (Head Load)*	18,496	739,840	46	1,854	33.0
Green Grass (Tree/Shrubs Fodder and Cut Grass) (Head Load*)	29,040	546,270	72.8	1,369	24.3
Leaf Litter (Green and Dry) (Head Load*)	37,286	591,552	94.2	1,483	26.3
Sal and non-Sal Timber (Cubic Feet & Number)	749	189,150	2.4	474	8.4
Plough (Number)	999	49,950	2.5	125	2.2
Small Pole (*Teka*) (in number)	7,304	131,472	18.3	330	5.8

Source: Field Survey, 2003.

Note: *One head load equivalent 45-50 Kg.

Table 7.6 depicts that total and average per household share of benefit in terms of gross monetary value of firewood forest product to total gross monetary value is higher (33.0 percent) followed by green and dry leaf litter (26.3 percent), tree/shrubs fodder and cut green grass (24.3 percent), Sal and Non-Sal Timber (8.4 percent), Small Pole (*Teka*) (5.5 percent) and plough (2.2 percent) respectively. Similarly total and average per household share of quantity of green and dry leaf litter to total forest product is higher (94.2 head load per household) followed by tree/shrubs fodder and cut green grass (72.8 head load per household), firewood (46 head load per household), Small Pole (*Teka*) number per household) (18.3), plough (2.5 number per household) and Sal and non-Sal timber (2.4 cubic feet and number per household) respectively.

7.4 Total and average gross Benefits/value (Income) of community forests

Table 7.7 illustrates the contribution of community forests in terms of an average gross value, average gross value per household and average gross value per hectare including gross margin/ person/day of each CFUG from community forests in the study area. Most of the CFUGs appear to be similar based on the gross value of products for each household.

Table 7.7

Gross values per household and per hectare from CF (in Nepalese rupees)

Gross Value and Forest Area

CFUGs	N*	Gross Value	Gross value/ Household/year	Forest Area (Hectare)	Gross value/ Hectare	Gross margin/ Person/day
Panchakanya	19	110,616	5,822	85.5	1,294	37
Dakshinkali	17	79,346	4,667	75.4	1,053	25
Arunganga	31	177,624	5,730	400.0	444	31
Oiputang	24	135,952	5,665	117.5	1,157	33
Jalasinghadevi	15	93,456	6,230	110.0	850	41
Khorsane	13	72,166	5,551	157.1	459	32
Shivaratrighat	28	128,034	4,573	126.9	1,009	31
Barnebelayate	26	119,952	4,614	200.0	600	23
Tarebhir	30	146,260	4,875	15.8	9,,257	30
Salleri	49	282,622	5,768	135.4	2,087	30
Salghari	19	158,966	8,367	117.6	1,352	39
Arunodaya	19	104,836	5,518	192.3	545	29
Rupadhari	19	104,976	5,525	207.8	505	29
Chhyangripasini	15	108,150	7,210	27.3	3,962	34
Chhabar	29	159,116	5,487	209.4	760	31
Bancharedanda	46	266,162	5,786	131.9	2,017	30
Grand Total	399	2,248,234	5,635	2309.9	985	31

Source: Field Survey, 2003.

* Number of Households

According to Table 7.7, Salghari, Chhyangripasini and Jalasinghadevi CFUGs have relatively higher average gross values per household followed by Panchakanya, Bancharedanda, Salleri, Arunganga, Oiputang, Khorsane, Rupadhari, Arunodaya and Chhabar CFUGs respectively. On the other hand, Shivaratrighat and Barnebelayate CFUGs have relatively lower gross values per household followed by Dakshinkali and Tarebhir CFUGs respectively. This means that those CFUGs whose gross values per household are higher they are considered more dependent on community forests despite the low level of gross value per hectare of forest. The main reason behinds more dependent on forests by these groups despite the low level of gross value per hectare of forest may be lack of alternatives or zero opportunity cost of labour. Thus, in all the CFUGs, subsistence forestry activities seem to be compulsion rather than attraction. Tarebhir and Chhyangripasini CFUGs have relatively higher level of gross value per hectare of forest and Arunganga and Khorsane CFUGs have a very low level of gross

value per hectare of forest. The variation in the values per hectare of forest is due to the forest size and forest type. The main reason behinds the very low level of gross value per household and gross value per hectare of forest products is likely to be subsistence outlook of existing community forestry policy which may impede forestry activities to go beyond subsistence level. Such attitudes may be unlikely to influence the increasing forest productivity and rural poverty reduction.

7.5 Distribution of Household Level CF Gross Income

7.5.1 Distribution of Household Level CF Gross Income by Forest Products and Caste/Ethnic Groups

On an average, compared to other forest product, the share of firewood product per household is higher for all the CFUGs followed by dry leaf-litter, fodder, green leaf litter, green grass, timber, small pole and plough respectively. Most CFUGs use dry litter product after firewood followed by fodder green leaf litter and green grass. The Annex table 7-B and 7-C depict in detail about the share of gross and per household monetary value of different forest product use by different caste groups within sixteen CFUGs.

Table 7.8 illustrates the product types and the share of monetary value of the benefits per household of each caste/ethnic groups. On an average, total CF income distribution from the all types of forest products is high for *Newar* households (28.2 percent) followed by *Brahmin/Chhetri* (25.7percent), *Janajati* (23.6 percent) and the *Dalit* (22.5 percent) respectively. This indicates that all the caste/ethnic groups of households compete in similar ways for the forest products particularly for fuelwood forest product. Table 7.8 shows that *Newar* and *Dalit* households are getting higher average percentage share of fuelwood (27.9 and 25.7 percent with per household CF gross income NRs. 2,163 and NRs.1,994) followed by the *Janajati* and *Brahmin/Chhetri* households (24.7 and 21.7 percent) with per household CF gross income NRs. 1,912 and NRs. 1,677 respectively. However, the distribution of fuelwood income to *Brahmin/Chhetri* and *Janajati* households is less than the *Newar* and *Dalit* households leading by *Newar* households. Total CF income distribution of rest of other forest products listed in Table 7.8 shows that income distribution from total income of leaf litter, small pole, green grass and plough is highest for *Brahmin/Chhetri* households followed by the *Newar*. Income distribution from total income of timber is highest for *Newar* households followed by the *Janajati*. Total CF income distribution from most of forest products is low for *Janajati* households followed by the *Dalit*. Compared to *Dalit* households, total CF income distribution from timber and small pole is high for *Janajati* households.

Table 7.8

Distribution of Per Household and Average Percentage of Gross Income by Product Types and Caste/Ethnic Groups (in Nepalese Rupees)

Caste Groups

Types of Forest Products	*Dalit* (N*= 43)		*Janajati* (N*= 156)		*Newar* (N*= 42)		*Brahmin/Chhetri* (N*= 158)		Total Average	
	NRs.	Percent	NRs.	Percent	NRs	Percent	NRs.	Percent	NRs	Percent
Fuelwood (including dry twigs)	1,994	25.7	1,912	24.7	2,163	27.9	1,677	21.7	1,854	34.1
Green Grass (Tree/shrubs Fodder and Cut Grass)	1,254	23.1	1,210	22.3	1,415	26.1	1,545	28.5	1,369	23.9
Leaf Litter (Green and Dry)	1,385	23.6	1,216	20.7	1,511	25.7	1,764	30.0	1,483	25.9
Timber (both Sal and Non -Sal)	84	4.4	618	32.7	850	45.0	338	17.9	474	8.3
Plough	119	23.7	111	22.2	131	26.2	139	27.8	125	2.2
Small Pole (both Sal and Non - Sal)	273	21.4	303	23.8	323	25.4	373	29.4	330	5.6
Total Average	5,108	22.5	5,370	23.6	6,393	28.2	5,837	25.7	5,635	100.0

Source: Field Survey, 2003.

* Number of Households.

Table 7.8 shows that that on an average, total 43 *Dalit* households (10.8 percent of total households) share 22.5 percent of the total gross value of forest resources with the average NRs 5,108 gross value per household. Within the *Dalit* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest for fuelwood (NRs 1,994) and lowest for timber (NRs 94). Total 42 *Newar* households (10.5 percent of total households) share average 28.2 percent of the total gross value of forest resources with the average NRs 6,393 gross value per household. Within the *Newar* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest for fuelwood (NRs 2,163) and lowest for plough (NRs 131). Similarly, total 156 *Janajati* households (39.0 percent of total households) share average 23.6 percent of the total gross value of forest resources with average of NRs 5,370 gross value per household. Within the *Janajati* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest for fuelwood (NRs,1,912) and lowest for plough (NRs 111).While total 158 *Brahmin/Chhetri* households (39.6 percent of total households) share average 25.7

percent of the total gross value of forest resources with NRs 5,837 average gross value per household. Within the *Brahmin/Chhetri* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest for leaf litter (NRs1,764) and lowest for plough (NRs 139).

The above discussion leads us to conclude that the distribution of average per household and average percentage of CF income from total CF income is higher for *Newar* households (NRs 6,393 and 28.2 percent) followed by the *Brahmin/Chhetri* (NRs 5,837 and 27.5 percent), *Janajati* (NRs 5,370 and 23.6 percent) and the *Dalit* (NRs 5,108 and 22.5 percent) respectively. This means that gross value of benefits share in terms of monetary income obtained and distributed is not positively related with the degree of caste groups (high and low caste/ethnic groups). However, it is lowest for *Dalit* households. Thus, it may be positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than the degree of caste/ethnic groups. Because all the lower caste households are getting more or less equal share of benefit in terms of monetary income (gross value) from CF than what *Janajati* households are getting. This means that although the difference in benefits obtained by high and low caste/ethnic is not always so different. However, household level benefit/income distribution of CPR from CF in terms of absolute dependent between high and low caste/ethnic groups seems relevant.

7.5.2 Distribution of Household Level CF Gross Income by Forest Products and Income Groups

Most of the rich income groups appear to be distinct based on the high per household of gross value of forest products compared to middle and poor income groups. Rich income groups from Salghari, Salleri, Bancharedanda, Arunganga, Chhyangripasini, Panchakanya and Khorsane CFUGs have relatively higher gross values per household compared to middle and poor income groups. Two middle-income groups from Salleri and Oiputang CFUGs have relatively higher gross values per household compared to rest of rich income groups. Remaining CFUGs have similar gross values per household between rich and middle - income groups. However, all the poor income groups from all the CFUGs have lower gross values per household compared to both rich and middle-income groups. Detail of distribution of total gross and per household value (income) from CF of each CFUG by income groups is presented in Annex Tables 7-D and 7-E.

Table 7.9 illustrates the product type and monetary values of the benefits per household of each income groups. The rich and medium households are getting equal share of firewood (34.3 percent) followed by poor income group (31.3 percent). This indicates that all the three groups compete for nearly the same sets of products from the

community forests. Table 7.9 portrays that the shares of rest of other respective forest products are slightly different for the rich and medium households while it is very different for the poor households.

Table 7.9

Distribution of Per Household and Average Percentage of Gross Income by Product Types and Income Groups (in NRs#)

Income Groups

Types of Forest Products	Rich (N*=111)		Medium (N*=143)		Poor (N*=145)		Total	
	NRs.	Percent	NRs.	Percent	NRs.	Percent	NRs.	Percent
Fuel wood (including dry twigs)	1,914	34.3	1,916	34.3	1,748	31.3	5,578	34.1
Green Grass (Tree/shrubs Fodder and Cut Grass)	1,846	43.7	1,646	39.0	730	17.3	4,223	23.9
Leaf Litter (Green and Dry)	2,351	50.5	1,992	42.8	315	6.8	4,659	25.9
Timber (both Sal and Non -Sal)	1,047	67.4	305	19.6	202	13.0	1,554	8.3
Plough	180	46.2	145	37.2	64	16.5	389	2.2
Small Pole (both Sal and Non -Sal)	447	44.0	392	38.6	178	17.5	1,017	5.6
Total Average	7,786	44.7	6,397	36.7	3,236	18.6	5,635	100.0

Source: Field Survey, 2003.

Nepalese Rupees

* Number of Households.

Table 7.9 shows that wealthier households are getting higher share of benefits in terms of monetary income from different types of forest products from CF than the poorer households. For example, households from rich income group are getting higher share of benefit per household in terms of monetary income (gross value) from green grass (43.7 percent), leaf litter (50.5 percent), timber (67.4 percent), plough (46.2 percent) and small pole (44.0 percent) followed by households of middle income group (39.0 percent), (42.8 percent), (19.6 percent), (37.2 percent) and (38.6 percent) respectively. Conversely, households from poor income group are getting lower share of benefit per household in terms of monetary income (gross value) from green grass (17.3 percent), leaf litter (6.8 percent), timber (13.0 percent), plough (16.5 percent) and small pole (17.5 percent). The Table also reveals that, the average share of benefits in terms of monetary income (gross value) for rich, medium and poor income groups are Rs.7,786 (44.7 percent), Rs. 6,397 (36.7 percent) and Rs.3,236 (18.6 percent) respectively. This means that gross value of benefits in terms of monetary income (gross value) obtained and distributed is positively related with the degree of household wealth endowment (agricultural land and livestock

ownership). On the other hand, the poor income group is getting far less than what rich and medium income groups are getting. This means that although the difference in benefits in terms of monetary income (gross value) obtained by rich and medium is not always so different, the poor invariably differs from the other two income groups in this respect. Thus, household level benefit distribution of CPR in terms of monetary income (gross value) from CF among the income group seems unkindly uneven.

7.5.3 Comparison of Household Level Distribution of CF Gross Income by Caste/Ethnic and Income Groups

On an average, 43 *Dalit* households (10.8 percent of total households) share average 22.5 percent of the total gross value of forest resources with the average of NRs 5,108 gross value per household. Within the *Dalit* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest in Barnebelayate (NRs7, 230) and lowest in Shivaratrighat (NRs 1,965). The total of 42 *Newar* households (10.5 percent of total households) share average 28.2 percent of the total gross value of forest resources with the average of NRs 6,393 gross value per household. Within the *Newar* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest in Salghari (NRs 8,212) and lowest in Barnebelayate (NRs 4,850). The total of 156 *Janajati* households (39 percent of total households) share average 23.6 percent of the total gross value of forest resources with the average of NRs Rs 5,370 gross value per household. Within the *Janajati* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest in Jalasinghadevi (NRs 7,856) and lowest in Barnebelayate (NRs 2,010). While The 158 *Brahmin/Chhetri* households (39.6 percent of total households) share 27.5 percent of the total gross value of forest resources with the average of NRs 5,837 gross value per household. Within the *Brahmin/Chhetri* group, the average share of per household benefit in terms of monetary income (gross value) from CF is highest in Salghari (NRs 10,545) and lowest in Dakshinkali (NRs 4,153). Details about the distribution of household level gross monetary value/income in terms of an average gross value per household of each CFUG from community forests between different income groups in the study area are presented in Annex Table 7-C.

Similarly, among the three income groups of each CFUG, most of the rich income groups appear to be distinct based on the high per household of gross value of forest products compared to middle and poor income groups. Rich income groups from Salghari, Salleri, Bancharedanda, Arunganga, Chhyangripasini, Panchakanya and Khorsane CFUGs have relatively higher gross values per household compared to middle and poor income groups. Two middle-income groups from Salleri and Oiputang CFUGs have relatively higher gross values per household compared to rest of rich income

groups. Remaining CFUGs have similar gross values per household between rich and middle-income groups. However, all the poor income groups from all the CFUGs have lower gross values per household compared to both rich and middle-income groups. Details about the distribution of household level gross monetary value/income in terms of an average gross value per household of each CFUG from community forests between different income groups in the study area are presented in Annex Table 7-E.

Table 7.10 summarizes comparatively the distribution of gross value/benefit (income) of CF among the caste/ethnic groups and income groups at the household level in the study area. If we look it at the aggregate level in the entire study area, the comparative analysis of CF gross income distribution tends to hide sharp variation between different income groups rather than different caste/ethnic groups. For example, among the caste/ethnic groups, the distribution of average per household and average percentage of CF income from total CF income is higher for *Newar* households (NRs 6,393 and 28.2 percent) followed by the *Brahmin/Chhetri* (NRs 5,837 and 27.5 percent), *Janajati* (NRs 5,370 and 23.6 percent) and the *Dalit* (NRs 5,108 and 22.5 percent) respectively. Among the income groups, the distribution of average per household and average percentage of CF income from total CF income is higher for rich households (NRs 7,786 and 44.7 percent) followed by the middle-income households (NRs 6,397 and 36.7 percent) and the poor income households (NRs 3,236 and 18.6 percent) respectively. This means that there is sharp variation of CF income distribution between the rich, medium and poor income groups of households than between the *Brahmin/Chhetri, Newar, Janajati* and the *Dalit* households. Among the caste/ethnic groups, all are getting nearly equal average share of benefit in terms of monetary income (gross value) from CF than what different income groups are getting. This means that although the difference in benefits obtained by high and low caste is not always so different. Thus, household level benefit distribution of CPR in terms of monetary income (gross value) from CF between high and low caste groups seems irrelevant.

On the other hand, among the income groups, the poor income group is getting far less than what rich and medium income groups are getting. This means that although the difference in benefits in terms of monetary income (gross value) obtained by rich and medium is not always so different, the poor invariably differs from the other two income groups in this respect. Thus, household level benefit distribution of CPR in terms of monetary income (gross value) from CF among the income group seems viciously uneven.

Table 7.10

Distribution of Total Household and Gross Income per Household by Caste/Ethnic Groups and Income Groups (in Nepalese Rupees)

Income Groups

Caste/Ethnic Groups	Rich				Medium				Poor				Total Average			
	N*	%	NRs	%	N	%	NRs	%	N	%	NRs	%	N	%	NRs	%
Dalit	10	23.2	6,669	41	15	34.9	6,528	40	18	41.9	3,057	19	43	10.8	5,108	22.5
Janajati	29	26.1	9,004	48	51	35.7	6,743	36	76	52.4	3,063	16	156	39.0	5,370	23.6
Newar	10	23.8	9,104	46	18	42.8	7,207	37	14	33.4	3,410	17	42	10.6	6,393	28.2
Brahmin/Chhetri	62	55.9	7,184	43	59	41.2	5,816	35	37	25.5	3,615	22	158	39.6	5,837	25.7
Total Average	111	27.8	7,786	44.7	143	35.8	6,397	36.7	145	36.4	3,236	18.6	399	100	5,635	100

Source: Field Survey, 2003.

* Number of Households.

Table 7.10 illustrates that at a disaggregated level, distribution of household level benefit of CPR in terms of monetary income (gross value) from CF among the caste/ethnic groups is not very skewed. Because *Dalit* households are only 10.8 percent of total households, whose total average share is 22.5 percent of the total gross value of forest resources with average of NRs 5,108 gross value per household. Similarly, *Newar* households are only 10.5 percent of total households whose total average share is 28.2 percent of the total gross value of forest resources with average of NRs 6,393 gross value per household. On the other hand, the *Janajati* households are 39 percent of total households and their total average share is 23.6 percent of the total gross value of forest resources with average of NRs 5,370 gross value per household, while the *Brahmin/Chhetri* households are about 40 percent of total households whose total average share is 25.7 percent of the total gross value of forest resources with average of NRs 5,837 gross value per household.

This means that the higher percentage of *Brahmin/Chhetri* households (40.0 percent) and *Janajati* (39.0 percent) are distributed as less average share (25.7 percent and 23.6 percent) of total gross value (income) from CF however, it is low for *Janajati* and little bit high for the *Brahmin/Chhetri* compared to the *Dalit* households but all these percentage share are relatively low in comparison of percentage share of gross value (income) from CF with the *Newar* households. Because the lower percentage of the *Dalit* households (10.8 percent) and *Newar* households (10.5 percent) are distributed (22.5 percent and 28.2 percent) share of gross value (income) from CF which is little bit low

for *Dalit* than *Janajati* and it is relatively higher for *Newar* in comparison with rest of the caste/ethnic groups of households. This means that although the average percentage share of gross value/income from CF is low for *Dalit* followed by the *Janajati* and *Brahmin/Chhetri* households, however, *Dalit* are getting higher share of gross value/income (22.5 percent) from CF for its lower percent households (10.8 percent). Thus, being a high average percentage share of gross value/income (23.6 percent and 25.7 percent) than the *Dalit*, *Janajati* and the *Brahmin/Chhetri* households are getting lower share of gross income from CF for their higher percent households (39 percent and 40 percent). Thus, the *Newar* is getting more share of CF income followed by *Dalit*, and *Janajati. Brahmin/Chhetri* households are getting far less share of CF income than what *Newar* and *Dalit* are getting. However, the difference in CF income obtained by the *Newar* and *Dalit* as well as the *Janajati* and the *Brahmin/chhetri* is not always so different, however, the *Janajati* and the *Brahmin/chhetri* invariably differs from the *Newar* and *Dalit* in this respect. In short, *Newar* is getting more share of CF income and the *Janajati* is getting far less share of CF income than rest of other caste/ethnic groups. This indicates that the gross value of benefits share in terms of monetary income obtained and distributed is not positively related with the degree of caste/ethnic groups (high and low caste/ethnic groups). But it may be positively related with the degree of household wealth endowment (agricultural land and livestock ownership). Thus, the notion that distribution of high share income from CPR goes to the so called high caste group is untrue in the context of the study area.

Table 7.10 illustrates that among the income groups, the average share of household level CF-income distribution for rich, medium and poor income groups are Rs.7,786 (44.7 percent), Rs. 6,397 (36.7 percent) and Rs.3,236 (18.6 percent) respectively. The distribution of household level CF-income is high for rich income group from all the caste groups followed by medium income group from all the caste groups and poor income group from all the caste groups. Within the income groups, the rich *Janajati* households are getting higher level of CF income (48.0 percent) than medium (36.0 percent) and poor *Janajati* (16.0 percent) followed by rich *Newar* (46.0 percent) than medium (37.0 percent) and the poor (17.0 percent), rich *Brahmin/Chhetri* (43.0 percent) than medium (35.0 percent) and the poor *Brahmin/Chhetri* households (22.0 percent). Not all the *Dalit* are homogeneous from the income status perspective. For example, the rich *Dalit* households are also getting higher level of CF income (41.0 percent) than medium (40.0 percent) and the poor *Dalit* households (19.0 percent). This means that the distribution of CF income between income groups of all the caste/ethnic groups appears uneven. Moreover, it is apparently severe for the different income groups of *Janajati* households followed by the *Dalit*, *Newar* and the *Brahmin/Chhetri* households

respectively. This indicates that income obtained from CF and distributed among the income group is positively related with the degree of household wealth endowment (agricultural land and livestock ownership). Because all the poor income groups from all the caste/ethnic groups are getting far less share of CF income than what all the rich and medium income groups from all the caste/ethnic groups are getting. However, the difference in CF income obtained by rich and medium income class from all the caste/ethnic groups is not always so different; the poor income class from all the caste/ethnic groups invariably differs from the other two income groups in this respect. Thus, household level benefit distribution of CPR in terms of monetary income (gross value) from CF among the income group seems unkindly uneven. Thus, the notion that distribution of high share income from CPR goes to the rich income class is true in the context of the study area.

7.6 Verification of Victim Hypothesis on Nepal's Community Forestry

7.6.1 Dependence on Community Forests

Dependence on community forests refers contribution of income from CF to the livelihood improvement as well as fulfillment of subsistence needs of local user households in the study area. The literature on poverty and the environmental/natural resources offers several disputed theories and hypothesis (agent hypotheses and victim hypotheses) about different linkages between poverty and environmental/natural resources. Under the agent hypotheses, poverty was seen to be a crucial cause of environmental degradation as poor communities were forced to over-cultivate soil, or deforest in order to survive. According to victim hypothesis, poor people are more directly dependent on biological resources for their livelihood than richer people. Loss of flora and fauna is thus relatively more costly to poorer segments of society. Furthermore, poor people often are compelled to settle close to these resources commonly found in open access areas, to be exploited at family-labor costs only. However, consistent with the growing theoretical literature, there is a large amount of empirical research dealing with poverty, inequality and the dependence of rural poor on CPRs based on victim hypotheses (Jodha, 1985, 1986, 1990, 1995; Iyengar, 1989; Beck, 1994; Singh et al., 1996; Iyengar & Shukla, 1999). They argued that poor people extract more resources from the commons due to greater reliance on natural (forest) resources.

Some scholars hypothesized that compared to the non-poor, the poor may depend more on the commons in relative terms but in absolute terms, their dependency is lower (Dasgupta, 1993). While the poor may attempt to minimize risk by using forest resources to mitigate shortfalls in consumption levels, the rich or the less poor may be interested in

enhancing their earnings by selling these resources, particularly, when there are good market opportunities. There appears to be a consensus that poorer households are dependent more on CPRs and consequently derive higher income from common property (forest) resources. Thus, attacking poverty in rural areas is then necessarily a matter of improving poor people's ability to derive sustenance and income from more productively and sustainably managed natural resources. Due to the exhaustible and/or degradable characteristics of forest resource, however, it is a renewable resource, which is declining with its overexploitation requires improved management techniques for resource users that continue to grow in both numbers and consumptive habits. Efforts to improve the management of natural resources, however, often focus narrowly on the technical characteristics of the exploitation or conservation of the resources while giving short shrift to the social and institutional structures that are needed to manage those resources in a more sustainable and equitable manner.

In order to examine the theoretical notion of victim hypothesis empirically into the Nepal's community forestry, this research study has also hypothesized that the low caste and poor households are less dependent in absolute terms, but more dependent in relative terms than the high caste and non-poor households on community forest resources. For this purpose, this section below provides empirical evidences to verify the victim hypothesis on the degree of absolute dependence and relative dependence on community forest resources between the low caste/poor households and the high caste/non-poor households.

7.6.1.1 Absolute Dependence on Community Forests by Caste/Ethnic and Income Groups

Absolute dependence on community forest refers to absolute contribution of forests to household income or gross income derived by households from community forest. Those caste/ethnic or income groups of households, whose total contribution of gross CF income to total household cash income is higher, they are considered to be more dependent, in absolute terms, on community forests. Similarly, those caste/ethnic or income groups of households whose total contribution of gross CF income to total household cash income is lower, they are considered to be less dependent, in absolute terms, on community forests.

Based on empirical data summarized in Annex Tables 7-B and 7-C, total gross and per household income were estimated to analyze the absolute dependence on CF by different caste/ethnic groups of households. Those caste/ethnic groups of households, whose total contribution of gross CF income to total household cash income is higher, they are considered to be more dependent, in absolute terms, on community forests and those

caste/ethnic groups of households whose total contribution of gross CF income to total household cash income is lower, they are considered to be less dependent, in absolute terms, on community forests. On an average, compared to other forest product, dependence on firewood product per household is higher for all the CFUGs followed by dry leaf litter, fodder, green leaf litter, green grass, timber, small pole and plough respectively. Most CFUGs are dependent on dry litter product after firewood followed by fodder green leaf litter and green grass. The Annex Tables 7-B and 7-C depict in detail about the total gross value and per household value from CF in terms of monetary value of different forest product use by different caste groups of households within sixteen CFUGs. Table 7.11 presents the extent of absolute dependence of CF on different caste/ethnic groups of households in the study area.

Table 7.11

Absolute Dependence on Community Forest in Terms of Per Household and Average Percentage of Gross Income by Product Type and Caste/Ethnic Group (in Nepalese Rs)

Caste/Ethnic Groups

Types of Forest Products	*Dalit* (N*= 43)		*Janajati* (N*= 156)		*Newar* (N*= 42)		*Brahmin/Chhetri* (N*= 158)		Total Average	
	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs	%
Fuelwood (including dry twigs)	1,994	25.7	1,912	24.7	2,163	27.9	1,677	21.7	1,854	34.1
Green Grass (Tree/shrubs Fodder and Cut Grass)	1,254	23.1	1,210	22.3	1,415	26.1	1,545	28.5	1,369	23.9
Leaf Litter (Green and Dry)	1,385	23.6	1,216	20.7	1,511	25.7	1,764	30.0	1,483	25.9
Timber (both Sal and non-Sal)	84	4.4	618	32.7	850	45.0	338	17.9	474	8.3
Plough	119	23.7	111	22.2	131	26.2	139	27.8	125	2.2
Small Pole (both Sal and on-Sal)	273	21.4	303	23.8	323	25.4	373	29.4	330	5.6
Total Average	5,108	22.5	5,370	23.6	6,393	28.2	5,837	25.7	5,635	100.0

Source: Field Survey, 2003.

* Number of Households.

Table 7.11 illustrates that extent of absolute dependence of different caste groups on community forest by product type and per household gross income. The average statistics of CF used by the different caste groups indicates that the *Newar* households are more dependent, in absolute term, on CF followed by *Brahmin/Chhetri*, *Janajati* and the *Dalit* households respectively. Because *Newar* households are getting higher average percentage share (28.2 percent) of CF income followed by *Brahmin/Chhetri* (27.5 percent), *Janajati* (23.6 percent) and the *Dalit* households (22.5 percent) respectively. Among the types of forest product from CF, Table 7.11 shows that *Newar* households are more dependent, in absolute term, on firewood followed by the *Dalit*, *Janajati* and

the *Brahmin/Chhetri* households because *Newar* are getting higher level of CF income from fuelwood per household (NRs 2163) followed by *Dalit* (NRs 1,994), *Janajati* (NRs1, 912), and the *Brahmin/Chhetri* (NRs 1,677) respectively. Compared to *Newar* and *Dalit*, the reason of low dependency on fuelwood to *Brahmin/Chhetri* and *Janajati* may be reliance on owned private land for additional requirement of fuelwood. Conversely, *Brahmin/Chhetri* households are more dependent, in absolute term, on leaf litter and green grass followed by *Newar*, *Dalit* and *Janajati* households. For example, *Brahmin/Chhetri* are getting higher level of per household CF income from leaf litter and green grass (NRs1,764 and NRs 1,545) followed by *Newar* (NRs 1,511and NRs 1,451), *Dalit* (NRs1,385 and NRs 1,254) and *Janajati* (NRs 1,216 and NRs 1,210) respectively. Compared to other caste/ethnic groups, the reason of high dependency on leaf litter and green grass to *Brahmin/Chhetri* may be larger landholding and livestock holding size than other caste/ethnic groups.

Similarly, dependence on other forest products such as timber, plough and small pole by different caste groups seems not so significant due to being a durable nature and yearly requirement as compared to the daily requirement nature of firewood, green grass and leaf litter and hence significant contribution to total CF income for each caste group. However, Table 7.11 shows that *Newar* and *Janajati* households are more dependent, in absolute term, on timber than *Brahmin/Chhetri* and *Dalit*. For example, *Newar* and *Janajati* are getting higher level of per household CF income from timber (NRs 850 and NRs 618) than *Brahmin/Chhetri* and *Dalit* (NRs 338 and NRs 84). Conversely, *Brahmin/Chhetri* are more dependent, in absolute term, on plough and small pole than all the other caste groups. For example, *Brahmin/Chhetri* are getting higher level of per household CF income from small pole and plough (NRs 373 and NRs 139) followed by the *Newar* (NRs 323 and NRs 131), *Janajati* (NRs303 and NRs111) and the *Dalit* (NRs273 and NRs 119) respectively. Compared to other caste/ethnic groups, the reason of high dependency on timber to the *Newar* and *Janajati* may be requirement of more house construction in that year due to separation of household members and fragmentation of household property. Similarly, Compared to other caste/ethnic groups, the reason of high dependency on plough and small pole to *Brahmin/Chhetri* may be larger landholding and livestock holding size than others.

Table 7.11 shows that that on an average, total 43 *Dalit* households (10.8 percent of total households) share 22.5 percent of the total gross value of forest resources with the average NRs 5,108 gross value per household. Within the *Dalit* group, the highest average share of per household income from fuelwood (NRs 1, 994) and lowest from timber (NRs 84) indicates that they are more dependent on firewood and less dependent on timber. Similarly, total 42 *Newar* households (10.5 percent of total households) share

average 28.2 percent of the total gross value of forest resources with the average NRs 6,393 gross value per household. Within the *Newar* group, the highest average share of per household income from firewood (NRs 2,163) and lowest from plough (NRs 131) indicates that they are more dependent on firewood and less dependent on plough. Likewise, total 156 *Janajati* households (39.0 percent of total households) share average 23.6 percent of the total gross value of forest resources with average of NRs 5,370 gross value per household. Within the *Janajati* group, the highest average share of per household income from fuelwood (NRs1,912) and lowest from plough (NRs111) indicates that they are more dependent on firewood and less dependent on plough. Correspondingly, total 158 *Brahmin/Chhetri* households (39.6 percent of total households) share average 25.7 percent of the total gross value of forest resources with NRs 5,837 average gross value per household. Within the *Brahmin/Chhetri* group, the highest average share of per household income from leaf litter (NRs1,764) and lowest from plough (NRs 139) indicates that they are more dependent on firewood and less dependent on plough.

The above discussion leads to conclude that high distribution of average per household and average percentage of CF income from total CF income to *Newar* households (NRs 6,393 and 28.2 percent) followed by the *Brahmin/Chhetri* (NRs 5,837 and 27.5 percent), *Janajati* (NRs 5,370 and 23.6 percent) and the *Dalit* (NRs 5,108 and 22.5 percent) respectively indicates that *Newar* households are more dependent on CF followed by the *Brahmin/Chhetri*, *Janajati* and *Dalit* households. This means that the dependency on commons is not positively related with the degree of caste/ethnic groups (high and low caste/ethnic groups). Because *Newar* is getting higher level of average per household and average percentage of CF income from total CF income than the *Brahmin/Chhetri*. Thus, *Newar* is more dependent on commons than the *Brahmin/Chhetri*. However, the dependency on commons is lowest for *Dalit* households. Thus, it may be positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than the degree of caste/ethnic groups. Because all the *Dalit* households are getting nearly equal share of income from CF than what *Janajati* households are getting. This means that although the difference in the dependency on commons in terms of CF income obtained by high and low caste is not always so different. Thus, household level dependency on CPR in terms of gross value/monetary income from CF between high and low caste groups seems irrelevant.

Based on empirical data summarized in Annex Tables 7-D and 7-E, total gross and per household income were estimated to analyze the absolute dependence on CF by different income groups of households. Those income groups of households, whose total contribution of gross CF income to total household cash income is higher, they are

considered to be more dependent, in absolute terms, on community forests and those income groups of households whose total contribution of gross CF income to total household cash income is lower, they are considered to be less dependent, in absolute terms, on community forests. Most of the rich income groups appear to be distinct based on the high per household of gross value of forest products compared to middle and poor income groups. Rich income groups from Salghari, Salleri, Bancharedanda, Arunganga, Chhyangripasini, Panchakanya and Khorsane CFUGs have relatively higher gross values/income per household compared to middle and poor income groups. Two middle-income groups from Salleri and Oiputang CFUGs have relatively higher gross values/income per household compared to rest of rich income groups. Remaining CFUGs have similar gross values/income per household between rich and middle-income groups. But all the poor income groups from all the CFUGs have lower gross values/income per household compared to both rich and middle-income groups. This means that those rich and middle-income groups whose gross values/income per household is higher they are considered to be more absolute dependent on community forests and those poor income groups whose gross values/income per household are lower they are considered to be less dependent on community forests. The Annex Tables 7-D and 7-E depict in detail about the total gross value and per household value from CF in terms of monetary value of different forest product use by different income groups of households within sixteen CFUGs. Table 7.12 presents the extent of absolute dependence of CF on different income groups in terms of per household gross income.

Table 7.12

Absolute Dependence on Community Forest in Terms of Per Household and Average Percentage of Gross Income by Product Type and Income Groups (in NRs)

Income Groups

Types of Forest Products	Rich (N*=111)		Medium (N*=143)		Poor (N*=145)		Total	
	NRs.	Percent	NRs.	Percent	NRs.	Percent	NRs.	Percent
Fuelwood (including dry twigs)	1,914	34.3	1,916	34.3	1,748	31.3	5,578	34.1
Green Grass (Tree/shrubs Fodder and Cut Grass)	1,846	43.7	1,646	39.0	730	17.3	4,223	23.9
Leaf Litter (Green and Dry)	2,351	50.5	1,992	42.8	315	6.8	4,659	25.9
Timber (both Sal and Non -Sal)	1,047	67.4	305	19.6	202	13.0	1,554	8.3
Plough	180	46.2	145	37.2	64	16.5	389	2.2
Small Pole (both Sal and Non - Sal)	447	44.0	392	38.6	178	17.5	1,017	5.6
Total Average	7,786	45.0	6,397	37.0	3,236	18.0	5,635	100.0

Source: Field Survey, 2003.

* Number of Households.

According to Table 7.12, wealthier (rich and middle-income groups) households are more dependent on community forests. They are getting higher level of CF gross income per household from different types of forest products than the poorer households. For example, households from rich income group are getting highest level of gross CF income per household from leaf litter (NRs.2,351) followed by fuelwood (NRs 1,914), green grass (NRs 1,846), timber (NRs 1,047), small pole (NRs 447) and plough (NRs 180) respectively. While middle income group of households followed by the rich income group are getting per household gross CF income from leaf litter (NRs.1,992) followed by fuelwood (NRs 1916), green grass (NRs 1646), small pole (NRs 392), timber (NRs 305), and plough (NRs 145) respectively. Conversely, poor income group of households are less dependent on CF than non-poor income groups of households. For example, compared to non-poor households, households from poor income group are getting gross CF income per household from firewood (NRs 1,748) followed by green grass (NRs 770), leaf litter (NRs.315), timber (NRs 202), small pole (NRs 178) and plough (NRs 64) respectively.

In the percentage basis, rich and middle - income groups are getting higher percentage of CF gross income than the poor income group. For example, rich income group are getting higher percentage of gross CF income from timber (67.4 percent) followed by leaf litter (50.5 percent), plough (46.2 percent), small pole (44.0 percent), green grass (43.7 percent) and fuelwood (34.3 percent). While middle income group followed by the rich income group are getting percentage share of gross CF income from leaf litter (42.8percent) followed by green grass (39 percent), small pole (38.6 percent), plough (37.2 percent), fuelwood (34.3 percent) and timber (19.6 percent) respectively. Conversely, poor income group are getting percentage of share of gross CF income from firewood (31.3 percent) followed by small pole (17.5 percent), green grass (17.3 percent), plough (16.5percent), timber (13.0 percent), and leaf litter (6.8 percent) respectively.

The information presented in Table 7.12 allows us to conclude that, poor households are less dependent on CF, in absolute term, than the non-poor or the rich and middle-income households. On the other hand, the non-poor households are more dependent on community forests in absolute term, than the poor. Because both the per household gross CF income and the average percentage shares of gross CF income to total gross CF income are far less for poor income groups as Rs.3,236 (18.6 percent) than the rich as Rs.7,786 (44.7 percent) and medium income groups as Rs. 6,397(36.7 percent) respectively.

This means that the poor income group is getting far less than what rich and medium income groups are getting. It is also clear that although the difference in gross CF income obtained by rich and medium is not always so different, the poor invariably differs from the other two income groups in this respect. Thus, household level absolute dependency on CPR among the income groups seems clear. The reason of lower absolute dependency of poor household on CPR is positively related with the degree of household assets and wealth endowment (agricultural land and livestock ownership). Rich and medium households have relatively more land and livestock than the poor income groups and hence they extract more agricultural and livestock related intermediate products from CF. Contrary to this poor income groups of households are less dependent on community forests because they have relatively less land and livestock than rich and middle - income groups and hence they extract little agricultural and livestock related intermediate products from CF. However, CF income per household for all the income groups is very low compared to non-CF income per household of all the income groups. The variation in the gross values per household is due to the household size variation among the different income groups. Very low level of income per household of all the income groups in all the CFUGs, indicates that forestry activities seem to be subsistence compulsion rather than enthusiastic attraction. Thus, the basic reason behind the very low level of gross value per household of forest products in all the CFUGs for all the income groups, particularly for poor income groups, is likely to be subsistence outlook of existing community forestry policy which may impede forestry activities to go beyond subsistence level. Such attitudes may unlikely to influence the increasing forest productivity and rural poverty reduction.

Comparison of Household Level Absolute Dependence on Community Forest by Caste/Ethnic and Income Groups

Table 7.13 summarizes the annual average gross and net income per household from CF by caste/ethnic groups estimated from the relevant data presented detail in Annex Tables 5-J, 5-K, 7-B, 7-C and 7-F

Table 7.13

Annual Average Gross and Net Income per Household from CF by Caste/Ethnic Group (in Nepalese Rupees)

Caste/Ethnic Groups	N*	Gross Income	Percent	Net Income	Percent
Dalit	43	5,108	22.5	1,413	20.5
Janajati	156	5,370	23.6	1,714	24.8
Newar	42	6,393	28.2	2,229	32.3
Brahmin/Chhetri	158	5,837	25.7	1,541	22.3
Total and Average	399	5,635	100.0	1,667	100.0

Source: Computed from Annex Tables 5-J, 5-K, 7-B, 7-C and 7-F.

* Number of Households.

The same data sets of Table 7.13 are presented graphically in Figure 2.

Figure 2

Annual Average Gross and Net Income per Household from CF by Caste/Ethnic Group (in Nepalese Rupees)

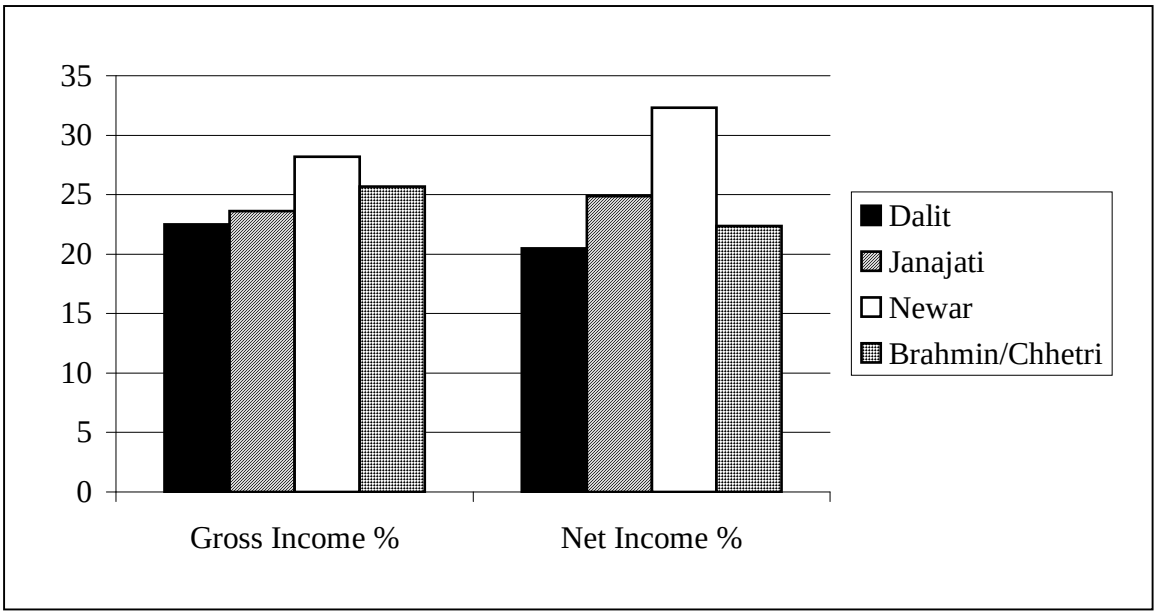


Table 7.13 and Figure 2 with the same data sets of Table 7.13 show that *Dalit* households are getting lower gross value/income and net value/income from CF and *Newar* households are getting higher gross value/income and net value/income from CF. The *Brahmin/Chhetri* households are getting high gross value/income after the *Newar* but getting lower net value/income than *Newar* and *Janajati* households. Income from CF increases gradually as one moves from the highest *Brahmin/Chhetri* to the lower *Newar*. This indicates that the so called high caste *Brahmin/Chhetri* households are less

dependent on CPR than *Newar* households. However, *Dalit* households are less dependent than rest of other caste/ethnic groups on CPR in terms of gross and net value/income from CF. This may be due to the fact that *Dalit* households have less land and livestock ownership and so they cannot not use intermediate forest products like fodder, leaf litter and grasses. The reason of low dependency on CPR to *Brahmin/Chhetri* and *Janajati* households than the *Newar* households may be reliance on owned private land for additional requirement of forest products particularly for fuelwood.

Thus, the distribution of gross and net income among the different caste/ethnic groups indicates that both the gross income and net income from CPR is an increasing function of household wealth endowments rather than degree of high and low caste group. Both the gross income and net income are not so significantly different between caste/ethnic groups; comparison of net income suggests that the four major caste/ethnic groups are not so statistically different.

Table 7.14 summarizes the annual average gross and net income per household from CF by income groups estimated from the relevant data presented in detail in Annex Tables 5-L, 5-M, 7-B, 7-C and 7-G.

Table 7.14

Annual Average Gross and Net Income per Household from CF by Income Group (in Nepalese Rupees)

Income Group	N*	Gross Income	Percent	Net Income	Percent
Rich	111	7,786	45.0	2,769	52.6
Middle	143	6,397	37.0	1,928	36.6
Poor	145	3,236	18.0	567	10.8
Total and Average	399	5,636	100.0	1,667	100.0

Source: Computed from Annex Tables 5-L, 5-M, 7-B, 7-C and 7-G.

* Number of Households.

The same data sets of Table 7.14 are presented graphically in Figure 3.

Figure 3

Annual Average Gross and Net Income per Household from CF by Income Group (in Nepalese Rupees)

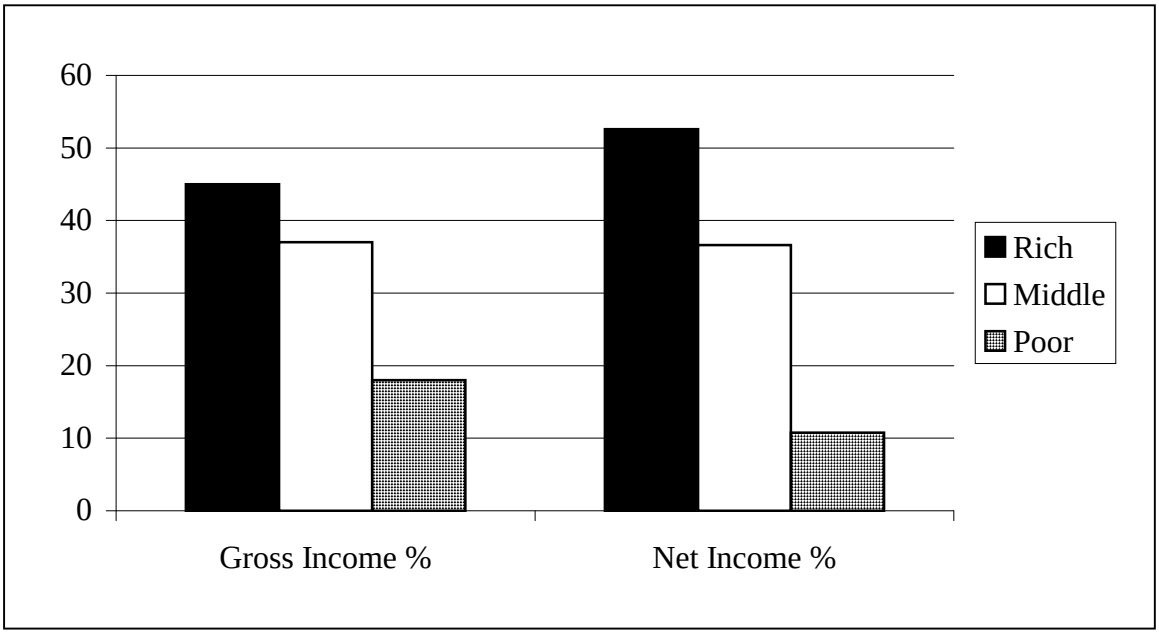


Table 7.14 and Figure 3 show that poorer households are getting lower gross and net value from CF and wealthier households are getting higher gross and net value from CF followed by the middle-income households. Income from CF increases gradually as one moves from the lowest to the highest income group. This may be because poorer households have less land and livestock ownership and so cannot not use intermediate forest products like fodder, leaf litter and grasses. These findings are similar to that of (Richards *et aI.*, 1999; & Adhikari, 2003), which substantiate that poorer households are at present benefiting less from CF mainly because they have less livestock and farmland, which provide the main demand for forest products as inputs.

The average net income per household from CF is presented on the last column of Table 7.14. Non-poor households are still better off than poorer households from CF. It appears that both the gross income and net income from CPR is an increasing function of wealth and both are significantly different between income groups, comparison of net income suggests that the three income groups are statistically different.

7.6.1.2 Relative Dependence on Community Forests by Caste/Ethnic and Income Groups

Relative dependence on community forest refers to the percentage contribution of forests to household income or the relationship between CF income and total non-CF household cash income. In order to verify the relative dependence of different caste groups and different income groups on community forests, data on the relationship between CF income and total non-CF household income is required. Thus, based on data calculation of percentage share of CF income to total non-CF household cash income of different caste/ethnic and income groups of households, this section examines the relative dependence of different caste/ethnic groups and income groups on community forests with the help of household level total CF income and total non-CF cash income of different caste/ethnic and income groups in the study area.

The relevant data calculation Based on Annex Tables 5-J, 5-K, 7-B, 7-C, and 7-F, percentage share of CF income to total non-CF household cash income of different caste/ethnic groups of households were derived to analyze the relative dependence on CF by different caste groups of households**.** Those caste/ethnic groups of households, whose percentage of total household income from CF to total non-CF cash income is higher, they are considered to be more dependent, in relative terms, on community forests and those caste/ethnic groups of households whose percentage of total household income from CF to total non-CF cash income is lower they are considered to be less dependent, in relative terms, on community forests**.** Table 7.15 presents the percentage contribution of CF income to total non-CF cash income by caste/ethnic group in the study area. To calculate the percentage share of CF gross and net income to total non-CF household cash income of different caste group's households is followed by summary statistics presented detail in Annex Tables 5-J, 5-K, 7-B, 7-C, and 7-F for the surveyed households.

Table 7.15 shows that the average percentage of total household income from CF to total non-CF cash income is high for Khorsane CFUG (31.6 percent) and it is low for Arunodaya CFU (9.2 percent). This means Khorsane CFUG is more dependent, in relative terms, on CF than the Arunodaya CFUG. Out of three caste/ethnic groups in Khorsane CFUG, *Newar* households are getting larger average percentage of total household income from CF to total non-CF household cash income (64.0 percent) followed by *Dalit* (31.1 percent) and *Brahmin/Chhetri* households (24.7 percent) respectively. This means Newar is more dependent, in relative terms, on CF followed by *Dalit* and the *Brahmin/Chhetri*. Similarly, Out of two caste/ethnic groups, only in the Arunodaya CFUG, *Dalit* households are getting larger average percentage of total

household income from CF to total non-CF household cash income (33.3 percent) than the *Brahmin/Chhetri* households (9.0 percent). In addition to these, the percentage of total household income from CF is higher for *Newar* in Arunganga (74.4 percent), Salghari (50.8 percent), and Panchakanya (24.6 percent) respectively. This means *Newars* are more dependent, in relative terms, on CF only in four CFUGs. Similarly, the percentage of total household income from CF is higher for *Janajati* households in Jalasinghadevi (102.0 percent) and Salleri (19.1 percent). This means Janajatis are more dependent, in relative terms, on CF only in two CFUGs. Likewise, the percentage of total household income from CF is higher for *Brahmin/Chhetri* households in Oiputang (55.8 percent), Shivaratrighat (22.6 percent), Dakshinkali (22.0 percent), Rupadhari (15.8 percent), Bancharedanda (12.9 percent) and Chhyangripasini CFUG (11.9 percent) respectively. This means *Brahmin/Chhetris* are more dependent, in relative terms, on CF in six CFUGs. Alike the *Newar*, the percentage of total household income from CF is higher for *Dalit* households in Barnebelayate (61.3 percent), Arunodaya (33.3 percent), Chhabar (16.6 percent) and Tarebhir (16.6 percent) respectively. This means Dalits are more dependent, in relative terms, on CF in four CFUGs.

Table 7.15

Percentage Contribution of Gross CF Income to Total

Non-CF Household Cash Income by Caste/Ethnic Group (in Nepalese Rupees)

Caste/Ethnic Groups

CFUG	*Dalit*	*Janajati*	*Newar*	*Brahmin/Chhetri*	Total Average
Panchakanya	13.9	9.3	24.6	8.9	14.8
Dakshinkali	0.0	13.6	13.7	22.0	14.5
Arunganga	28.0	32.5	74.4	16.1	22.2
Oiputang	31.8	19.0	0.0	55.8	24.3
Jalasinghadevi	0.0	102.0	43.5	11.0	20.0
Khorsane	0.0	31.1	64.0	24.7	31.6
Shivaratrighat	15.8	21.2	0.0	22.6	22.0
Barnebelayate	61.3	1.9	12.8	18.3	16.3
Tarebhir	16.6	11.2	0.0	16.3	13.4
Salleri	8.9	19.1	15.1	13.3	15.7
Salghari	44.2	20.7	50.8	22.3	27.4
Arunodaya	33.3	0.0	0.0	9.0	9.2
Rupadhari	0.0	12.1	8.0	15.8	11.9
Chhyangripasini	0.0	4.9	0.0	11.9	10.2
Chhabar	16.6	12.0	0.0	7.3	10.8
Bancharedanda	11.8	10.1	0.0	12.9	11.4
Total Average	16.6	14.1	21.8	14.0	14.9

Source: Field Survey, 2003.

According to Table 7.15, the average percentage of total household income from CF is lower for *Brahmin/Chhetri* households compared to *Newar*, *Dalit* and *Janajati.* For example, gross income from CF as a percentage of total income is lower for *Brahmin/Chhetri* households (14.0 percent) than those for *Newar* (21.8 percent), *Dalit* (16.6 percent) and *Janajati* (14.1 percent).

If we look at net income in Table 7.16, the average percentage of net CF income relative to total household income of *Newar* households is higher (7.6 percent) followed by the *Dalit* (4.6 percent), *Janajati* (4.5 percent) and *Brahmin/Chhetri* (3.7 percent) respectively. The results also suggest a negative relationship between net CPR income and caste group i.e. the so called high caste *Brahmin/Chhetri* households have lowest gross and net income from CF as a percentage of total income than others even than the *Dalit*. However, since this trend should be analyzed using time series data, what is shown here is more suggestive than conclusive.

Table 7.16

Percentage Contribution of Net CF Income to Total

Non-CF Household Cash Income by Caste/Ethnic Groups (in Nepalese Rupees)

Caste/Ethnic Groups

CFUG	*Dalit*	*Janajati*	*Newar*	*Brahmin/Chhetri*	Average
Panchakanya	4.1	2.0	9.4	2.3	4.7
Dakshinkali	0.0	3.6	4.3	1.9	3.6
Arunganga	7.3	8.6	18.1	4.5	6.0
Oiputang	10.1	5.8	0.0	19.5	7.7
Jalasinghadevi	0.0	33.0	10.2	1.1	4.1
Khorsane	0.0	8.3	23.6	7.5	9.8
Shivaratrighat	0.7	3.6	0.0	6.7	5.7
Barnebelayate	25.7	-0.1	5.0	1.2	1.6
Tarebhir	3.8	2.4	0.0	4.4	3.2
Salleri	2.3	8.6	4.6	2.3	5.7
Salghari	16.3	9.8	26.2	10.9	13.1
Arunodaya	-5.1	0.0	0.0	2.1	2.1
Rupadhari	0.0	4.3	2.2	5.8	4.1
Chhyangripasini	0.0	1.8	0.0	3.9	3.4
Chhabar	5.0	3.2	0.0	2.2	3.0
Bancharedanda	2.9	3.0	0.0	3.9	3.3
Average	4.6	4.5	7.6	3.7	4.4

Source: Field Survey, 2003.

The relevant data calculation based on Annex Tables 5-L, 5-M, 7-D, 7-E, and 7-G, percentage share of CF income to total non-CF household cash income of different income groups of households were derived to analyze the relative dependence on CF by different income groups of households. Those income groups of households, whose percentage of total household income from CF to total non-CF cash income is higher, they are considered to be more dependent, in relative terms, on community forests and those income groups of households whose percentage of total household income from CF to total non-CF cash income is lower they are considered to be less dependent, in relative terms, on community forests. To calculate the percentage share of CF gross and net income to total non-CF household cash income of different income group's households is followed by the summary statistics presented in detail in Annex Tables 5-L, 5-M, 7-D, 7-E, and 7-G for the surveyed households.

Table 7.17 portrays that among the three income groups of each CFUG, most of the poor income groups appear to be distinct based on the high percentage of total household income from CF to total non-CF cash income compared to rich and middle income groups. Poor income groups from Jalasinghadevi, Salghari, Khorsane, Arunganga, Chabar, Panchakanya and Rupadhari, CFUGs have relatively higher percentage of total household income from CF to total non-CF cash income compared to rich and middle-income groups. Eight middle-income groups from Shivaratrighat, Arunodaya, Dakshinkali, Salleri, Barnebelayate, Tarebhir, Chhyangripasini and Bancharedanda CFUGs have relatively higher percentage of total household income from CF to total non-CF cash income compared to rich and poor income groups. Only one rich income group from Oiputang CFUG has relatively higher percentage of total household income from CF to total non-CF cash income compared to middle–income and the poor income groups. On an average, the poor income groups have relatively higher percentage of total household income from CF to total non-CF cash income followed by the middle-income and the rich income groups. Table 7.17 presents the extent of relative dependence of different income groups on community forest by income groups.

Table 7.17

Percentage Contribution of Total CF Income to Total Non-CF Household Cash Income by Income Groups (in Nepalese Rupees)

Income Group

CFUG	Rich	Medium	Poor	Average
Panchakanya	16.7	10.8	23.5	14.8
Dakshinkali	12.0	20.3	14.8	14.5
Arunganga	15.8	32.3	34.5	22.2
Oiputang	45.1	14.7	36.4	24.3
Jalasinghadevi	12.3	61.8	80.6	20.0
Khorsane	28.0	33.4	36.9	31.6
Shivaratrighat	22.3	31.0	17.9	22.0
Barnebelayate	17.2	20.0	7.4	16.3
Tarebhir	13.9	14.3	11.2	13.4
Salleri	13.6	20.2	13.0	15.7
Salghari	22.8	23.8	75.0	27.4
Arunodaya	6.0	29.7	15.3	9.2
Rupadhari	8.6	11.8	20.0	11.9
Chhyangripasini	9.1	12.3	0.0	10.2
Chhabar	9.8	8.6	26.0	10.8
Bancharedanda	11.5	11.9	10.2	11.4
Average	13.1	15.6	18.2	14.9

Source: Field Survey, 2003.

Alike the claims made in the literature of poverty and commons this study also shows that the percentage of total household income from CF is higher for poorer households compared to middle income and wealthier or non-poor households. Many scholars on commons claim that CPRs currently contribute about 12.0 percent and 15.9 to 25.0 percent of the total household income of poorer households in India (Beck & Nesmith, 2001; Jodha, 1986, 1995). In a study of 29 villages in Southeastern Zimbabwe, (Cavendish, 1998, 1999) arrived at even larger estimates. He observed that the proportion of income based directly on the commons is about 35 percent. Moreover, the figure for the poorest quintile is 40.0 percent. Based on a qualitative assessment of babassu products in Maranho, Brazil (Hetch et al., 1998) also conclude that the product offer support to the poorest of the poor, especially women. The data presented in Table 7.17 demonstrate that gross income from CF as a percentage of total non-CF cash

income is higher for poorer households (18.2 percent) than those for middle-wealth (15.6 percent) and richer households (13.1 percent).

If we look at net income in Table 7.18, the average percentage of net CF income relative to total household income of poorer households is lower (3.2 percent) than that of richer and middle-income households (4.7 percent). Thus, the results from Table 7.15 suggest a possible negative relationship between gross CPR income and wealth-ranked group i.e. the poor wealth-ranked households have highest gross income from CF as a percentage of total non-CF cash income than the rich and middle-income households due to the low non-CF cash income for the poorer income group than the non-poor income groups. On the contrary, the results from Table 7.18 suggest a possible positive relationship between net CPR income and wealth-ranked group i.e. the poor income households have lowest net income from CF as a percentage of total income than the rich and middle-income households due to high share of transaction costs of community forest management for the poorer income group than the non-poor income groups. However, since this trend should be analyzed using time series data, what is shown here is more suggestive than conclusive.

Table 7.18

Percentage Contribution of CF Net Income to Total Non-CF Household Cash Income by Income Groups (in Nepalese Rupees)

Income Groups

CFUG	Rich	Medium	Poor	Grand Total
Panchakanya	6.3	3.6	4.8	4.7
Dakshinkali	4.0	6.7	0.2	3.6
Arunganga	4.8	9.3	6.0	6.0
Oiputang	17.5	4.9	9.1	7.7
Jalasinghadevi	2.6	11.8	16.4	4.1
Khorsane	12.1	9.7	5.0	9.8
Shivaratrighat	5.5	9.5	4.8	5.7
Barnebelayate	3.0	2.4	-1.0	1.6
Tarebhir	3.9	3.9	1.2	3.2
Salleri	6.6	8.1	1.9	5.7
Salghari	13.1	8.0	39.0	13.1
Arunodaya	1.5	8.6	-0.4	2.1
Rupadhari	3.3	4.3	4.5	4.1
Chhyangripasini	3.4	3.5	0	3.4
Chhabar	2.8	2.9	4.2	3.0
Bancharedanda	4.5	3.4	0.8	3.3
Average	4.7	4.7	3.2	4.4

Source: Field Survey, 2003.

Comparison of Household Level Relative Dependence on Community Forest in Terms of Percentage of Gross and Net CF Income to Total Non-CF income by Caste/Ethnic and Income groups

Table 7.19 summarizes the percentage of gross and net CF income to total non-CF income by different caste/ethnic groups of households as estimated from the relevant Annex Tables based on surveyed households of sixteen CFUGs of four caste groups in category which are presented in detail in Annex Tables 5-J, 5-K, 7-B, 7-C and 7-F.

Table 7.19

Percentage of CF Gross and Net Income to Total Household Non-CF Income by Caste/Ethnic Groups (in Nepalese Rupees)

Caste/Ethnic Group	(%) of Gross CPR Income	(%) of Net CPR Income
Dalit	16.6	4.6
Janajati	14.1	4.5
Newar	21.8	7.6
Brahmin/Chhetri	14.0	3.7
Total and Average	14.9	4.4

Source: Computed from Annex Tables 5-J, 5-K, 7-B, 7-C and 7-F.

The same data sets of Table 7.19 are presented graphically in Figure 4

Figure 4

Percentage of CF Gross and Net Income to Total Household Non-CF Income by Caste/Ethnic Groups (in Nepalese Rupees)

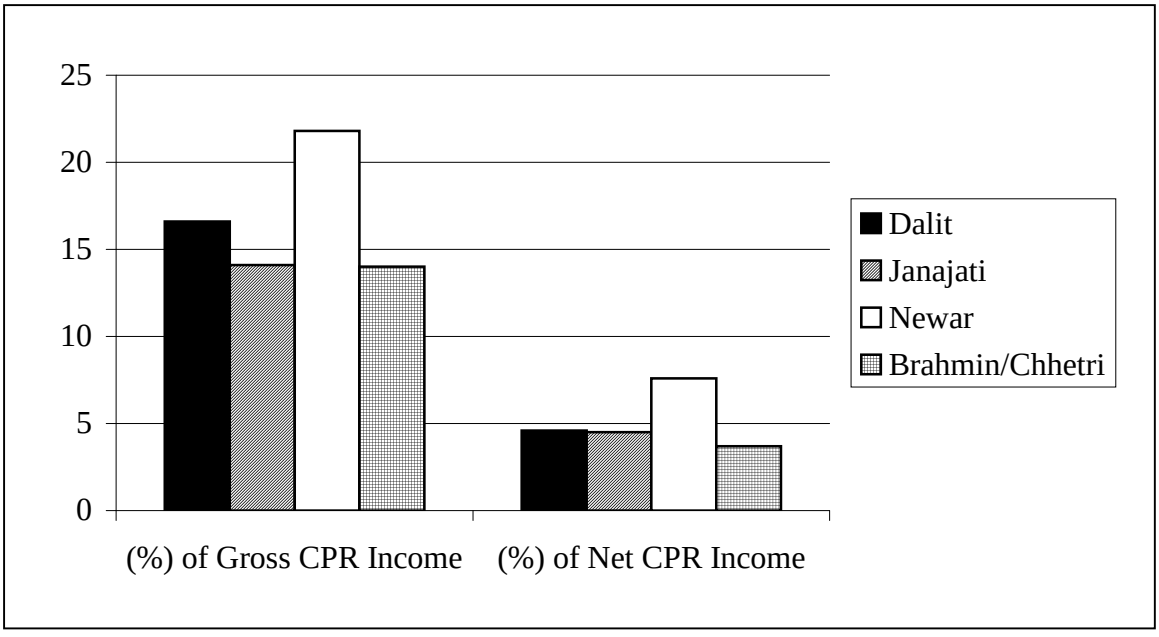


Table 7.19 and Figure 4 shows that *Newar* households have higher percentage of gross and net income from CPR to total household income than rest of other caste/ethnic groups. However, *Dalit* households have higher percentage of gross and net income from CPR to total household income than the *Brahmin/Chhetri* households and the *Janajati*. Percentage of gross and net income from CPR to total household income increases gradually as one move from *Brahmin/Chhetri* caste to *Newar* and *Janajati*. Moreover, Percentage of gross and net income from CPR to total household income increases gradually as one moves from the *Brahmin/Chhetri* caste to *Dalit*. This indicates that the so called high caste *Brahmin/Chhetri* households are less dependent, in relative terms, on CPR than *Newar, Janajati* and *Dalit* households in terms of percentage of gross and net income from CPR to total household income. This may be due to the fact that *Brahmin/Chhetri* has higher non-CF household income than the *Newar, Janajati* and *Dalit*. The reason of more dependent of *Dalit*, in relative terms, on CF than *Brahmin/Chhetri* households may be due to the fact that *Dalit* households have relatively lower non-CF household income than *Brahmin/Chhetri* households. Thus, the high percentage of gross and net income from CPR to total household non-CF income among the different caste/ethnic group indicates that the percentage contribution of gross income and net income from CPR to total household non-CF income is an increasing function of level of household non-CF income and decreasing function of transaction cost incurred rather than degree of so called high and low caste/ethnic groups. Both the percentage of gross and net income from CPR to total household non-CF income are not so significantly different between caste/ethnic groups, comparison of net income suggests that the four caste/ethnic groups are not so statistically different.

Table 7.20 summarizes the percentage of gross and net CF income to total non-CF income by different income groups of households as estimated from the relevant data of surveyed households of sixteen FUGs of three income groups in category which are presented in detail in Annex Tables 5-L, 5-M, 7-D, 7-E, and 7-G.

Table 7.20

Percentage of Gross and Net Income from CPR to Total Household Income by Income Groups (in Nepalese Rupees)

Income group	(%) of Gross CPR Income	(%) of Net CPR Income
Rich	13.1	4.7
Middle	15.6	4.7
Poor	18.2	3.2

Source: Computed from Annex Tables 5-L, 5-M, 7-D, 7-E, and 7-G.

The same data sets of Table 7.20 are presented graphically in Figure 5

Figure 5

Percentage of Gross and Net Income to Total Household Income of Three Income Groups (in Nepalese Rupees)

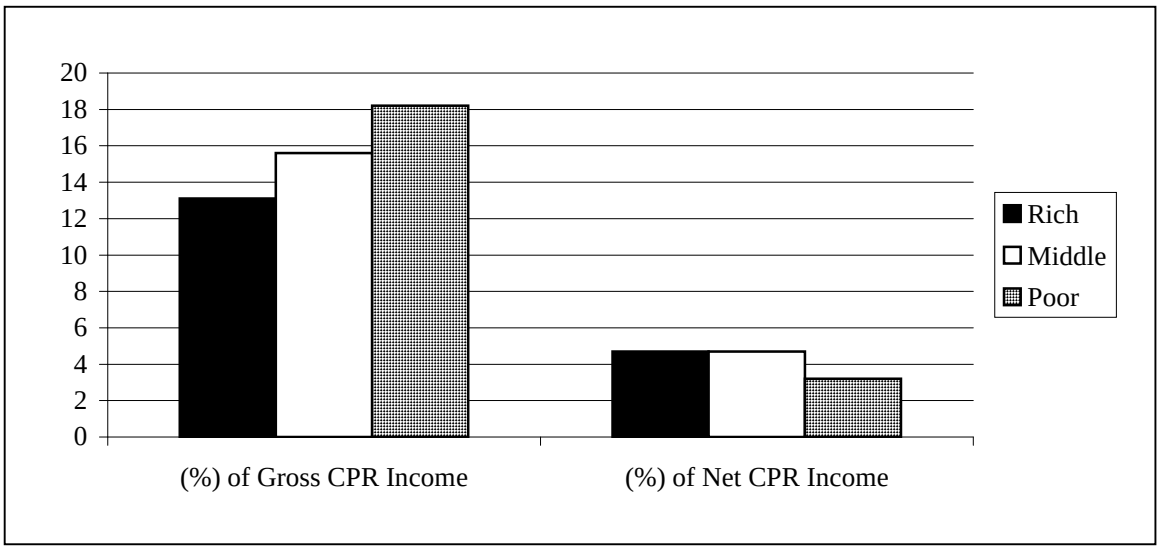


Table 7.20 and Figure 5 show that poorer households have high percentage of gross income from CPR to total household non-CF income than the wealthier households whereas poorer households have low percentage of net income from CPR to total household non-CF income than the wealthier households. Percentage of gross income from CF to total household non-CF income increases gradually as one move from the highest to the lowest income group whereas percentage of net income from CF to total household non-CF income decreases gradually as one moves from the highest to the lowest income group. Both the percentage of gross and net income from CPR to total household non-CF income is significantly different among the wealth-ranked groups. The reason of high percentage of gross income from CPR to total household non-CF income (more dependent) of poor households, in relative terms, on CF than the rich and middle-income groups of households may be due to the fact that poor income households have relatively lower non-CF household income than the rich and middle-income groups of households. On the contrary, the reason of low percentage of net income from CPR to total household non-CF income (low dependent) of poor households, in relative terms, on CF than the rich and middle-income groups of households may be due to the fact that poor income households have relatively high share of transaction cost incurred than the rich and middle-income groups of households. Thus, the high percentage of gross income from CPR to total household non-CF income among the different income group indicates that the percentage contribution of gross income from CPR to total household non-CF income is decreasing function of level of household non-CF income and the low

percentage of net income from CPR to total household non-CF income among the different income groups indicates that the percentage contribution of net income from CPR to total household non-CF income is increasing function of transaction cost incurred in forestry activities. These findings are different to that of (Adhikari, 2003), which confirms that percentage of total household income from CF is lower for the poorer households (14.0 percent) compared to rich (22.0 percent) and middle-income households (20.0 percent). Similarly, the percentage of net income from CPR to total household non-CF income for the poorer households is (5.0 percent) compared to rich (4.0 percent) and the middle-income households (8.0 percent). According to him, non-poor households are still better off than the poorer households from CF, or the non-poor households are more dependent, in relative terms, on CF than the poorer households.

7.7 Determinants of Income from Community Forests

This section analyses the determinants of household-level income from CF. Theory and empirical evidence on the socio-economic factors influencing household-level income from community-based forest management have drawn little attention in social science literature. Moreover, there is limited prior knowledge on socio-economic determinants of forest dependency and the nature of their impacts (Gunatilake, 1998). Hence, the scatter plot method was used to scrutinize independent variables. The covariance matrix of independent variables was examined to find whether there is multicolinearity among the independent variables.

7.7.1 Descriptive Statistics

Descriptive statistics, presented in Table 7.21, provide evidence of socio-economic differences among forest users households. One-way ANOVA suggests that the three income groups significantly differ in terms of land and livestock holdings. Further, a large difference in income from different forest products (fuel- wood, grass and fodder and leaf litter) by these income groups is also evident. This provides a measure of inequality between income groups. In general, it can be said that the sample households belonging to the three income groups are heterogeneous in terms of income and private asset holdings.

Table 7.21

Descriptive Statistics

VARIABLES	Minimum	Maximum	Mean	Std. Deviation
CASTEH	0	1	.11	.31
CASTEL	0	1	.39	.49
AGE	21	100	53.62	15.51
GEND	0	1	.69	.46
LITSTATUS	0	1	.50	.50
LANDHOLD	.00	6.00	1.27	1.01
LIVSTOCKUNIT	0	72	12.72	10.06
TRANSDAY	0	77	23.34	11.12
HHSIZE	1	17	6.41	2.59
FUGM	0	1	.53	.50
FUECM	0	1	.14	.34
GFOREST	.00	1.00	.5414	.49
BFOREST	.00	1.00	.5965	.49
CFDIST	1	10	4.53	2.75
INCOMEPOOR	0	1	.36	.48
INCOMERICH	0	1	.63	.48
MARKETDIST	0	5	2.07	1.52
Total annual average gross CF income (in Nepalese Rupees)	730	38220	5634.67	3220.87
Annual average fuel wood gross income (in Nepalese rupees)	.00	7200.00	1854.23	884.75
Annual average fodder and green grass gross income (in Nepalese rupees)	.00	4600.00	1369.09	755.28
Annual average green and dry leaf litter gross income (in Nepalese rupees)	.00	3960.00	1479.49	970.61

The results for determinants of household income from CF are given in the following Table 7.22. The R-square and adjusted R-square for the estimation is as high as 68% and 66% respectively. The F-statistics for overall goodness of fit of the model is 35.0, which is highly significant at ~t = 0.000. It is evident from the analysis that most of the important variables are significant with the expected sign. In particular, household level income from CF is significantly influenced by the number of livestock, landholding size, household size, age, literacy status, income status, number of more FUG membership, key post or member post hold in forest user's executive committee, transaction cost days spent by households in various community forest-related activities, quality of forests and distance to market.

Differences in benefits from CF are thus correlated with differences in productive assets. For instance, cattle ownership is positively and significantly related to household income from CF. More importantly, forest income for those households belonging to the higher income group, i.e., "INCOMRICH" is positive and significant. Conversely, there is a negative and significant relationship between income from CF and the variable "INCOMPOOR," which is a dummy variable for the lower income group. This indicates that resource usage from CF is directly proportional to private endowments since the poorer segments of the community are not benefiting as much as the non-poor

Table 7.22

Determinants of income from community forests

Variables	Coefficients	Std. Error	t - ratio	p - value
CONSTANT	7.403	.339	21.829*	.000
CASTEH	1.084E-02	.059	.185	.854
CASTEL	-8.596E-02	.042	-2.038**	.043
AGE	.132	.065	2.021**	.044
GEND	-2.362E-02	.042	-.565	.573
LITERACYSTATUS	5.990E-02	.041	1.465	.144
LANDHOLD	1.599E-02	.030	.529	.597
LIVSTOCKUNIT	.133	.028	4.683*	.000
TRANSDAY	-7.383E-03	.027	-.278	.781
HHSIZE	.141	.045	3.140*	.002
FUGM	5.232E-02	.037	1.401	.162
FUECM	3.631E-02	.048	.753	.452
GFOREST	-7.684E-03	.041	-.188	.851
BFOREST	3.387E-03	.041	.083	.934
CFDISTANT	-.114	.022	-5.302*	.000
INCOMEPOOR	-.214	.209	-1.025	.306
INCOMERICH	.370	.209	1.767**	.078
MARKETDIST	1.740E-02	.037	.467	.641

*and** indicates 1% and 5% significant levels

R^2 = .68 Adjusted R^2 = .66 F statistics = 35.0

According to Table 7.22, it appears that both the caste groups of households i.e.

Brahmin/Chhetri and *Dalit* (so called high and low caste) benefit less from CF. Both are getting lower gross value/income and net value/income from CF than *Newar* households. The negative income from CF decreases gradually as one moves from *Brahmin/Chhetri* to *Dalit* caste group. This indicates that the *Brahmin/Chhetri* households are less dependent on CPR than *Dalit* households in terms of gross and net value/income from CF. This can be explained by the observation that *Dalit* households, who do not keep large livestock herds, do not benefit considerably from products such as tree and grass fodder and leaf litter. Most FUGs have also introduced controls limiting extraction of forest products. Moreover, *Dalit* households have very little influence in the decision-making process so they cannot influence forest management decisions in their favour. On the other hand, the reason of low CPR income to *Brahmin/Chhetri* households may be reliance on own private land for additional requirement of forest products. Thus, the results also suggest a negative relationship between CPR income and caste group i.e. the so called high caste *Brahmin/Chhetri* households have lowest gross and net income from CF as a percentage of total income than other caste/ethnic groups even than the *Dalit* caste.

Better-educated households may have better earning opportunities outside the village commons and forest extraction activities may be less attractive or negligible for those households. On the other hand, most of the children and youth member in the family go to school and for higher education. Higher educational levels may also be associated with greater opportunity costs for labour (Yanggen & Reardon, 2001). Thus, most forestry activities in the study site appeared to be phenomenon of work of illiterate and literate people. In this respect, the assumption that higher number of literate member in the family may be positively related to household-level benefits from community forests is accepted positively and significantly related to forest income. This finding is dissimilar to that of Gunatilake (1998) and Adhikari (2003) who observe that education of the family members is negatively related to forest income in the tropical biosphere reserves in Sri Lanka and community forest in Kavre and Sindhupalanchok district of Nepal. Regarding gender, it is remarkable that those households headed by male members benefit less from CF than those with female heads. Despite a very low level of saying in decision-making process of FUEC, women generally have high level of involvement in the entire forestry activities. Lacks of alternative sources of income, female-headed households are more dependent on CF and hence try to derive more income from CF than the male headed households. Male people have various alternate works outside from CF and hence they need not to be limited on and within the vicinity of community forest. Moreover, men may not involve as far as women to extract forest products due to the household financial responsibilities and other socio-political obligation. This observation

is also dissimilar to that of (Amacher et al., 1993; & Adhikari, 2003) who observed that women are not the sole collectors of fuel wood from commons.

With regard to the regression result of transaction costs day, the income from CF seems negatively associated with transaction days against the assumption that households who spent more time/days on decision-making, implementation and monitoring activities appear to obtain more income from different forest products. However, the subsequent sub-section 8.1.5 of the cost analyses in chapter eight indicates that, among the caste groups, *Dalit* and *Brahmin/Chhetri* households have lower transaction costs and membership fees (35.3 percent and 35.2 percent) than the *Newar* and *Janajati* households (36.3 percent and 36.2 percent) respectively. Consequently, *Dalit* and *Brahmin/Chhetri* households obtained lower level of benefits than the *Newar* and *Janajati*. This means that among the two caste/ethnic groups i.e. *Dalit*/ *Brahmin/Chhetri* and *Newar*/*Janajati* households, the income from CF seem positively associated with transaction days. Contrary to this, among the income groups, out of total cost, 31.0 percent for rich income group, 31.5 percent for middle-income group and 49.1 percent for poor income group's transaction costs and membership fees which is lower than the benefits for the rich and middle-income groups and higher for the poor income group. This means that among the poor and non-poor income groups of households, the income from CF seems negatively associated with transaction days. This cost is an obligatory cost of common property forest resource management to be remaining a legal and authorized member to use forest resources at subsistence scale from CF by all income groups as this was not a necessity when the forest was *de facto* an open access prior to management of forest by local community user groups.

'The number of more CFUG membership' variable, which is if household membership possession of more than two CFUGs appear positively and significantly related to forest income than the household belong to only one membership of CFUG. These may be because households get more forest products from other additional CFUG. Likewise, 'key post or member post hold in forest user's executive committee' variable, which is if 'key post or membership representation by household in 'forest user's executive committee' show positively and significantly related to forest income than the household not represented in 'forest user's executive committee'. These may be because members get correct information by engaging in the decision-making process about when and where to collect.

Regarding the forest condition, two types of forest were observed in the study area, i.e., more than 75.0 percent *crown covered* by forest species and less than 75.0 percent *crown covered* by forest species in community forest. The former is considered as good forest

condition and was assumed positively and significantly related with forest income from such type of forest than the later condition of forest that is considered a bad forest condition. However, the dummy variable for more green covered forest is found to be negatively associated with forest income, which is against the notion of community forestry. This indicates that, although, environmental value by vegetation cover (bio-physical condition) of forest resources are found remarkably enhanced since the forest resource management regime shifted from state to local community participatory management, however, it is little concern in such a society where poverty is pervasive and it warrants immediate goods to fulfill daily needs. This shows that there is an increasing trend in restricting the access to the dense forest resources for the rural poor after introducing the community forestry on which their livelihoods are deeply fastened. This may be the fact that either rules of CFUG or forest policy of government have given more emphasis exclusively on subsistence benefit from non wood forest products ignoring well being benefit from all form of forest resource which have greater and direct impact on rural poverty reduction. The past decade has witnessed an increasing emphasis on community-based resource management with a focus on poverty alleviation. The belief was that giving local user groups' formal property rights provides them with an incentive to manage extraction of fuel wood, fodder, and other forest products in a sustainable manner and community welfare will increase as a result of an increase in forest resources and halting degradation. But coming to date, despite having the most innovative policies to promote community-based resource management in place, community forestry in Nepal is said to be unable to reduce rural poverty and to provide a significant contribution to the livelihood of poor and marginalized people due to its failure to take into account well being benefit approach for commercial use and equity of sustainable resource distribution within the resource using heterogeneity community in the society (Dahal: 2003).

Similarly, regarding the forest quality, two types of forest were observed in the study area, i.e., broadleaved forests and pine forests *(Pinus roxburghii)*. Broadleaved forests have multiple uses and it is considered positively associated with forest income while pine forest has very limited use and it is negatively associated with forest income. Thus, the dummy variable for broad-leaf forest is positive and significant compared to pine forest. Because pine trees suppress the ground flora vegetation and make the sites unfavorable for ground grass collection. Further, they are useless for fodder and pine needles are an inferior source of manure (as well as being less effective in preserving the water supply) (Somanathan *et al.,* 2002). This indicates that forest types influence the amount of harvest and income level by their effect on productivity of labour used in collection and gathering. The variable of distance to community forest, which is if near

(in km) from the house is positively and significantly related to forest income and if it is far (in km) from the house is negatively and insignificantly related to forest income. The availability of forest products near to the forest, people may harvest more and people who are living far away from the forest have a tendency of less harvesting of forest products from CF due to long traveling. Similarly, the market distance variable, which is also if near (in km) from the house is negatively and insignificantly related to forest income and if it is far (in km) from the house is positively and significantly related to forest income. The availability of market near to the house may divert people from forest dependent activities due to alternate earning opportunities. People who are living far away from the market depends more on the local commons to sustain their livelihoods. (Gunatilake, 1998; & Adhikari, 2003) also show similar result in the Sinharaja forest of Sri Lanka and community forest in Kavre and Sindhupalanchok district of Nepal.

CHAPTER 8

8 EXTERNALITIES AND BENEFIT-COST ANALYSIS OF COMMUNITY FORESTS

In this chapter, externalities and community forests have been analyzed in terms of benefits accrued from the community forests and costs incurred of community forest management by heterogeneous caste/ethnic and income groups of households in the study area. The working definition of externalities refers to the effects of benefits and costs of forest resource management activities not directly reflected in the market. An externality occurs when one person's consumption or production behavior affects that of another without any compensation. A community forest refers to common property resources that benefit all users who are authorized members of FUG. Externalities and CF goods are important sources of market failure and thus raise serious public policy questions. Therefore, Forest Act 1993 and Forest Regulation 1995 are in place to regulate CF in Nepal.

The price of the forest goods need not reflect its social value in consumption and management due to presence of externalities. Therefore, some households may use or consume too much and some households may use or consume too little so that equity outcome of forests may be inefficient. Thus, in this chapter, an attempt has been made to show exactly how externalities create equity inefficiencies in terms of net benefits and cost-benefit ratio of CF among the caste and income groups at household level. The possible remedies involve legal rights of those adversely affected to charge and provision of alternative incentives such as availability of electricity and gas at discount rate to those who create negative externalities.

Externalities can be negative or positive. Negative externality occurs in the community forests when one income and caste group uses or consumes too little CF goods by sharing high common management costs than the other income and caste groups, i.e., they are unable to internalize the positive externality in terms of benefits from CF as their rivals could do. Similarly, positive externality occurs in the community forests when one income and caste group uses or consumes too many by imposing common management costs on the other income and caste groups, i.e., they are able to externalize the negative externality in terms of costs from CF as their rival could not do. The benefits and costs of one's action (use and management of CF) are said to be internalized when one is made to bear them in full (Todaro, 2004). Each of the income group as well as caste/ethnic group of households, however, have no incentive to account for the external costs and benefits that they impose or share to one another when making use and

management decisions of community forests as a common property resources. Moreover, there is no market in which these external costs and benefits from the community forests can be transmitted into the price of forest products used by different income and caste groups of forest dependent rural households.

Therefore, this section tries to explore the positive-negative externality effects of community forest management to seek uneven distribution of benefit and transaction costs of common forest resource management on different income and caste groups of households. The part of externality issues- negative externality in terms of transaction cost and positive externality in terms of benefit from community forest management is taken into account to measure the positive-negative externality effects of community forest management. The positive-negative externalities have differential impacts of actual benefits accrued and transaction costs incurred by different wealth- ranked and caste groups within the community forest user groups (CFUGs). The CPR literature argued that defining property rights internalized the externality. However, despite the defining communal usufruct property rights of community forests of Nepal in place, those non-poor and high caste households are benefiting more than the poor and low caste households by imposing the greater transaction costs on the poor and low caste households. Unless internalization of positive externality in terms of benefits reaped and negative externality in terms of costs incurred by all different income and caste groups of households within the CFUGs, there is remaining the question about the likelihood of collective action, equity and efficiency issues in the people's participatory communal management of community forests. This is the main question, which this study has tried to seek the answer based on analysis of positive externality (benefits) and negative externality (transaction costs) of common forest resource management.

Hence, this chapter analyses cost structure of use and management and gross and net benefits from community forest to examine the positive and negative externality effects (in terms of gross income accrued from and transaction cost incurred of community forest management) on different caste/ethnic groups and income classes to show the benefits and costs sharing pattern of CF management at local level. Finally, yet importantly, based on gross benefits accrued from and gross cost incurred of CF management by different caste/ethnic groups and income classes, this chapter discusses the results of net benefits and benefit-cost ratios obtained by different caste/ethnic groups and income classes from cost-benefit analysis.

8.1 Cost structures over Community Forest Management

Three types of costs-labour cost, transaction cost and cash cost, borne by users were identified for the cost analysis. Labour cost were calculated as labour costs of time directly associated with finding, extracting, processing and transporting the different types of forest products from the forest areas to the house multiplying by the per man day average wage rate at all the study sites. According to the local condition average 7 hours were reported for one-day working hour and average wage rate for one-day were reported as NRs. 50.

Transaction costs- (decision making cost, implementation cost and monitoring cost) simply measured in terms of labour opportunity costs of time spent in decision-making activities, different types of forestry implementing activities and different types of forestry monitoring activities. It was calculated as labour costs of time directly associated with decision-making activities, implementing activities and monitoring activities multiplying by the per man day average wage rate at all the study sites. According to the local condition average 7 hours were reported for one-day working hour and average wage rate for one-day were reported as NRs. 50. A membership fee refers the fees required to pay to become a socially permitted user within the specified CFUG. It is a compulsory fee amount decided by the general assembly of each CFUG to enter into the CFUG. Those users who do not have willingness to pay outright excluded from the forest resource use. To get the total gross cost for each caste and income group, these costs were added in each case. The cost incurred by households were quantified and averaged to represent the cost per household for each caste and income groups.

8.1.1 Labour Cost of Community Forest by Caste/Ethnic and Income Groups

Labour costs were calculated as labour costs of time directly associated with finding, extracting, processing and transporting the different types of forest products from the forest areas to the house multiplying by the per man day average wage rate at all the study sites. According to the local condition average 7 hours were reported for one-day working hour and average per capita wage rate for one-day were reported as NRs. 50. Based on these two data, labour cost per household was estimated as follows. Table 8.1 reveals numerous interesting remarks regarding the relative and absolute share of per household labour cost incurred by different caste/ethnic and income groups within and between the each of CFUG in the study area. The following Table 8.1 summarizes the labour cost per household among the caste/ethnic groups and income groups of households at the household level based on surveyed households of sixteen CFUGs of

four caste/ethnic and three income groups in category which is presented in detail in the annex Table 8-A and 8-B for the whole study area.

Table 8.1

Labour Cost per Household of CF Use by Income and Caste/Ethnic Groups (In Nepalese Rupees)

Income Groups

Caste/Ethnic Groups	Rich			Middle			Poor			Total & Average		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	3,234	42.2	15	3,064	40.0	18	1,363	17.8	43	2,392	24.0
Janajati	29	3,676	45.4	51	3,151	38.9	76	1,274	15.7	156	2,334	23.0
Newar	10	3,440	42.9	18	3,206	39.9	14	1,380	17.2	42	2,653	26.0
Brahmin/Chhetri	62	3,396	43.2	59	2,937	37.4	37	1,521	19.4	158	2,786	27.0
Total & Average	111	3,458	44.0	143	3,061	39.0	145	1,359	17	399	2,553	100.0

Source: Field Survey, 2003.

Note: *Number of households.

Table 8.1 shows that, among the income groups, average share of labour cost for rich, medium and poor income groups are Rs.3,458 (44.0 percent), Rs. 3,061 (39.0 percent) and Rs.1,359 (17.0 percent) respectively. The share of household level labour cost of forest harvesting is high for rich income group followed by medium income group and poor income group from all the caste groups. Similarly, among the caste groups, average share of labour cost of forest harvesting is high for *Brahmin/Chhetri* households (Rs. 2,786 or 27.0 percent), followed by *Newar* (Rs.2,653 or 26.0 percent), *Dalit* (Rs.2,392 or 24.0 percent) and *Janajati* (Rs.2,334 or 23.0 percent) respectively. Within the rich income groups, the rich *Janajati* households are sharing higher level of labour cost (45.4 percent) followed by *Brahmin/Chhetri* (43.2 percent), *Newar* (42.9 percent) and the *Dalit* (42.2 percent) respectively. Likewise, within the middle-income groups, the *Dalit* households are sharing higher level of labour cost (40.0 percent) followed by *Newar* (39.9 percent), *Janajati* (38.9 percent) and *Brahmin/Chhetri* (37.4 percent) respectively. Within the poor income groups, Brahmin/Chhetri households are sharing higher level of labour cost (19.4 percent) followed by *Dalit* (17.8 percent), *Newar* (17.2 percent) and the *Janajati* (15.7 percent) respectively. This means that the labour cost sharing between income groups from all the caste/ethnic groups appears uneven due to uneven distribution of CF benefits. The difference in labour cost sharing by all the caste/ethnic groups is not always so different but the poor income class from all the caste/ethnic

groups invariably differs from the other two income groups in this respect. Moreover, it is apparently severe for the different poor income group of households from all caste/ethnic groups.

The summary statistics of Table 8.1 demonstrates about the variation of labour costs incurred by different caste/ethnic groups of households within and between the groups of households. It could be viewed in relation with average household level benefits accrued by different caste/ethnic groups of households. For example, out of four cast/ethnic groups, *Brahmin/Chhetri* households are sharing an average labour costs by 27.0 percent followed by *Newar* 26.0 percent, *Dalit* 24.0 percent and the *Janajati* 23.0 percent while they are getting gross value per household by 27.5 percent, 28 percent, 22.5 percent, and 23.6 percent respectively. Similarly, the variation of labour costs incurred by different income groups of households within and between the groups could be viewed in relation with average household level benefits accrued by different income groups of households. For example, out of three income groups of households, the rich households are sharing an average labour costs by 44.0 percent followed by middle income 39.0 percent and the poor households 17.0 while they are getting gross value per household by 45.0 percent, 37.0 percent and 18.0 percent respectively. This indicates that benefits obtained from CF and labour costs sharing among the caste/ethnic groups are positively related with the degree of income status or household wealth endowment (agricultural land and livestock ownership) rather than class status.

However, from the externality viewpoint, benefits from harvesting of forest products and labour cost of forest products harvesting are seen to be completely internal for all the income and caste/ethnic groups of households. The externality effect of CF in terms of benefits (positive externality) and labour costs (negative externality) is positively related on different caste/ethnic and income groups of households i.e. higher the labour costs higher will be the benefits and vice versa. According to Table 8.1 even considerable variation of labour cost sharing to harvest forest products among the caste/ethnic and income groups indicates that equity outcome of forests may not be inefficient. Because users themselves are being able to internalize both the positive and negative externality of forest harvesting activities in terms of benefits and labor costs. Enjoying the benefit according to burdening the labour cost is the central notion of internalization of positive and negative externality from common property resources. Nobody could externalize the labour costs (negative externality) to others to gain benefits (positive externality) from CF as common property resources. Despite the notion that distribution of high share income from CPR goes to the rich income class rather than high caste group is true in the context of the study area however, in case of labour cost of forest product harvesting,

externalities did not create equity inefficiencies among the different caste/ethnic and income groups of households in the study area.

8.1.2 Transaction Costs of Community Forest Management by Caste/Ethnic and Income Groups

Three broad types of transaction costs- decision making cost, implementation cost and monitoring cost were taken to calculate the total transaction cost. To get the total transaction cost for each caste/ethnic and income group, these three costs were added in each case. The total transaction cost including decision making cost, implementation cost and monitoring cost incurred by households were quantified and averaged to represent the transaction cost per household for each caste/ethnic and income groups. Tables 8.2, 8.3, 8.4 and 8.5 reveal numerous interesting remarks regarding the relative and absolute share of decision making cost, implementation cost and monitoring cost including total transaction costs per household incurred by caste/ethnic and income groups within and between the caste/ethnic and income groups of each CFUG in the study area.

8.1.2.1 Decision Making Cost of Community Forest Management by Caste/Ethnic and Income Groups

Cost of decision making refers the costs incurred during the process of acquiring information about forest and community, and the cost of coordinating the activities such as identification of potential users, preparation of forest management plan, and negotiating with the forest department. These costs are mainly the time spent for general assembly meetings and executive committee meetings by all the user communities, conflict resolution and so on. Decision making cost were simply measured in terms of labour opportunity costs of time spent in decision-making activities. Table 8.2 summarizes the decision-making cost per household among the caste/ethnic groups and income groups of households at the household level based on surveyed households of sixteen FUGs of four caste/ethnic and three income groups in category which is presented in detail in the annex Table 8-C and 8-D.

Table 8.2

Decision Making Cost per Household of CF Management by Caste/Ethnic and Income Groups (in Nepalese Rupees)

Income Groups

Caste/Ethnic Groups	Rich			Middle			Poor			Average Per Household		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	88	36.3	15	77	31.9	18	77	31.8	43	80	21.0
Janajati	29	100	38.0	51	82	31.0	76	81	30.9	156	85	22.0
Newar	10	116	39.2	18	69	23.4	14	111	37.4	42	95	25.0
Brahmin/Chhetri	62	146	39.8	59	116	31.7	37	105	28.5	158	125	33.0
Average Per Household	111	126	41.0	143	94	30.0	145	90	29.0	399	101	100.0

Source: Field Survey, 2003.

*Number of Households

The Table 8.2 illustrates that, among the income groups, average per household share of decision-making cost for each of the rich, medium and poor income groups are Rs.126 (41.0 percent), Rs. 94 (30.0 percent) and Rs.90 (29.0 percent) respectively. The share of household level decision-making cost of CF management is high for rich income group followed by medium income group and poor income group. Similarly, among the caste/ethnic groups, average per household share of decision-making cost of forest management is high for *Brahmin/Chhetri* households (Rs. 125 or 33.0 percent), followed by *Newar* (Rs.95 or 25.0 percent), *Janajati* (Rs.85 or 22.0 percent) and the *Dalit* (Rs.80 or 21.0 percent) respectively. Within the rich income groups, *Brahmin/Chhetri* households are sharing higher level of decision-making cost (39.8 percent) followed by *Newar* (39.2 percent), *Janajati* (38, 0 percent), and the *Dalit* (36, 3 percent) respectively. Likewise, within the middle-income groups, *Dalit* households are sharing higher level of decision-making cost (31.9 percent) followed by *Brahmin/Chhetri* (31.7 percent), *Janajati* (31.0 percent) and the *Newar* (23.4 percent) respectively. Within the poor income groups, *Newar* households are sharing higher level of decision-making cost (37.4 percent) followed by *Dalit* (31.8 percent), *Janajati* (30.9 percent) and the *Brahmin/Chhetri* (28.5 percent) respectively. This means that the decision-making cost sharing between income groups from all the caste/ethnic groups appears uneven regarding the uneven distribution of benefits from CF. Table 7.5 clearly indicates that the difference in decision-making cost sharing by all the caste/ethnic groups is not always so different but the poor income class from all the caste/ethnic groups invariably differs from the other two income groups in this respect. Moreover, it is apparently severe for

the different poor income group of households from the all caste/ethnic groups. This indicates that benefits obtained from CF and decision-making cost sharing among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership).

The benefits from CF and decision-making costs of CF management are said to be internalized if each of the caste/ethnic group of households is made to bear them in full. The summary statistics of Table 8.2 demonstrates the variation of decision-making costs incurred by different caste/ethnic groups of households could be viewed in relation with average household level benefits accrued by different caste/ethnic groups of households. For example, out of four cast/ethnic groups of households, *Brahmin/Chhetri* households are sharing an average decision-making costs by 33.0 percent followed by *Newar* 25.0 percent, *Janajati* 22.0 percent and the *Dalit* 21.0 percent while they are getting gross value per household by 27.5 percent, 28 percent, 23.6 percent and 22.5 percent respectively. Comparative data of the benefits accrued and decision-making costs incurred by different caste/ethnic groups of households indicates that even the *Brahmin/Chhetri* households have more involvement in decision-making but *Newar* have more gross value per household despite to have low decision-making cost compared to the *Brahmin/Chhetri*. Both of *Janajati* and the *Dalit* households have also higher gross value/benefits per household than the decision-making costs incurred by them. Thus, the *Brahmin/Chhetri* have completely failed to internalize the benefit from CF as per the decision-making costs incurred and rest of other caste/ethnic groups led by the *Newar* have disproportionately being able to internalize the benefit from CF by externalized the decision-making costs on the *Brahmin/Chhetri*. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the Brahmin/Chhetri should take part in overall decision-making costs of forest management. Thus, the *Newar, Janajati* and the *Dalit* are getting more benefit and paying less decision-making costs without any compensation to the *Brahmin/Chhetri* households.

Thus, the externality effect of CF in terms of benefits (positive externality) and decision-making costs (negative externality) is negatively related to so called high caste *Brahmin/Chhetri*. According to Table 8.2, considerable variation of decision-making cost sharing to manage CF among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of four caste/ethnic groups, one of *Brahmin/Chhetri* is being unable to internalize both the positive and negative externality of CF management in terms of benefits and decision-making costs. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place nobody

could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued and decision-making costs incurred of CF use and management by the different caste/ethnic groups of households, the externalities of CF has not created equity efficiencies within and between the caste/ethnic groups of households in the study area.

Similarly, the benefits from CF and decision-making costs of CF management are said to be internalized if each of the income group of households made to bear them in full. The summary statistics of Table 8.2 demonstrates the variation decision-making costs incurred in relation with benefits accrued by different income groups of households within and between the income groups. For example, three income groups of households – rich, middle and poor income households are sharing an average decision-making costs by 41.0 percent, 30.0 percent and 29.0 percent respectively while they are getting average gross value/benefit per household 45.0 percent, 37.0 percent and 18.0 percent respectively.

Comparative data of the benefits accrued and decision-making costs incurred by different income groups of households indicates that even the rich income groups of households have more involvement in decision-making process but middle income groups of households have more gross value per household despite to have low decision-making cost compared to the rich income groups of households. Contrary to this, poor income group of households has low decision-making cost per household than the non-poor households but they have lowest average gross value per household than the decision-making cost incurred. In summary, the poor income group of households has more decision-making cost per household than gross value/benefit per household and the rest of other income groups of households have more gross value/benefit per household than decision-making cost per household. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the high decision-making costs incurred by them. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the poor income groups of households should take part in overall decision-making costs of forest management. Thus, the middle and rich income households are getting more benefit and paying less decision-making costs without providing any compensation to the poor income groups of households.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (decision-making costs) is negatively related to the poor income groups of households. According to Table 8.2, considerable variation of decision-making

cost sharing to manage CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups one of the poor groups of households is being unable to internalize both the positive and negative externality of CF management in terms of benefits and decision-making costs. While middle and rich income groups of households are disproportionately being able to internalize the benefit from CF by externalized the decision-making costs on poor income group of households. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the costs (negative externality) on others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefit accrued and decision-making costs incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups of households in the study area.

8.1.2.2 Implementation Cost of Community Forest Management by Caste/Ethnic and Income Groups

Implementation cost refers the costs incurred in carrying out obligatory forestry activities such as thinning, pruning, fire protection and cost of local trail construction and repair/maintenance from community to forest areas and so on in order to meet the terms with management decisions. Implementation costs were simply measured in terms of labour opportunity costs of time spent in different types of forestry implementing activities.

Table 8.3 summarizes the implementation cost per household among the caste/ethnic groups and income groups of households at the household level based on surveyed households of sixteen CFUGs of four caste and three income groups in category which is presented in detail in the Annex Table 8-E and 8-F.

Table 8.3

Implementation Cost per Household of CF Management by Income and Caste/Ethnic Groups (in Nepalese Rupees)

Caste/Ethnic Groups	Income Groups											
	Rich			Middle			Poor			Total Per Household		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	1,055	36.8	15	927	32.3	18	883	30.8	43	938	23.0
Janajati	29	1,117	36.9	51	974	32.1	76	940	31.0	156	984	24.0
Newar	10	1,100	32.3	18	1,178	34.5	14	1,132	33.2	42	1,144	28.0
Brahmin/Chhetri	62	1,142	35.9	59	1,075	33.8	37	964	30.3	158	1,075	26.0
Total Per Household	111	1,124	35.4	143	1,036	33.3	145	958	31.4	399	1,032	100.0

Source: Field Survey, 2003.

* Number of Households

Table 8.3 illustrates that, among the income groups, average per household share of implementation cost for each of the rich, medium and poor income groups is Rs.1,124 (35.4 percent), Rs. 1,036 (33.3 percent) and Rs.958 (31.4 percent) respectively. The share of household level implementation cost of CF management is high for rich income group followed by medium income group and poor income group. Similarly, among the caste/ethnic groups, average per household share of implementation cost of forest management is high for *Newar* households (Rs.1, 144 or 28.0 percent) followed by the *Brahmin/Chhetri* (Rs. 1,075 or 26.0 percent), *Janajati* (Rs. 984 or 24.0 percent) and the *Dalit* (Rs.938 or 23.0 percent) respectively. Within the rich income groups, *Janajati* households are sharing higher level of implementation cost (36.9 percent) followed by *Dalit* (36.8 percent), *Brahmin/Chhetri* (35.9 percent) and the *Newar* (32.3 percent) respectively. Likewise, within the middle-income groups, *Newar* households are sharing higher level of implementation cost (34.5 percent) followed by *Brahmin/Chhetri* (33.8 percent), *Dalit* (32.3 percent) and the *Janajati* (32.1 percent) respectively. Within the poor income groups, *Newar* households are sharing higher level of implementation cost (33.2 percent) followed by *Janajati* (31.0 percent), *Dalit* (30.8 percent) and the *Brahmin/Chhetri* (30.3 percent) respectively. This means that the implementation cost sharing between income groups from all the caste/ethnic groups appears uneven regarding the uneven distribution of benefits from CF. Table 8.3 clearly indicates that the difference in implementation cost sharing by all the caste/ethnic groups is not always so different but the poor income class from the three caste/ethnic groups except *Newar* households invariably differs from the other two income groups in this respect. Moreover, it is apparently severe for the poor income group of households from the three caste/ethnic groups. This indicates that benefits obtained from CF and implementation

cost sharing among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than high and low caste/ethnic groups.

The summary statistics of Table 8.3 demonstrates the variation of implementation costs incurred by different caste/ethnic groups of households which could be viewed in relation with average household level benefits accrued by different caste/ethnic groups. For example, out of four cast/ethnic groups - *Newar*, *Brahmin/Chhetri, Janajati* and the *Dalit* are sharing an average implementation costs by 28.0 percent, 26.0 percent, 24.0 percent, and 23.0 percent respectively while they are getting gross value per household 28.2 percent, 27.5 percent, 23.6 percent and 22.5 percent respectively. Thus, benefits from CF and implementation of CF management are said to be internalized if each of the caste/ethnic group is made to bear them in full. The summary statistics of Table 8.3 demonstrates the variation of benefits accrued and implementation costs incurred by different caste/ethnic groups of households within and between the caste/ethnic groups. Comparative data of the benefits accrued and implementation costs incurred by different caste groups of households indicates that the *Newar* and *Brahmin/Chhetri* have more involvement in implementation activities and hence to have more gross value per household than the *Janajati* and the *Dalit*. Contrary to this, *Janajati* and the *Dalit* have less involvement in implementation activities and hence to have less gross value per household than *Newar* and the *Brahmin/Chhetri*. However, *Janajati* and the *Dalit* households have failed to internalize the benefit from CF as per the implementation costs incurred and *Newar* and the *Brahmin/Chhetri* are being able to internalize the benefit from CF by externalized little share of implementation costs on *Janajati* and the *Dalit*. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, *Janajati* and the *Dalit* must have taken additional share in overall implementation costs of forest management. Thus, *Newar* and the *Brahmin/Chhetri* are getting a little bit more benefit and paying less implementation costs without providing any compensation to *Janajati* and the *Dalit* households.

Thus, the externality effect of CF in terms of benefits (positive externality) and implementation costs (negative externality) is negatively related to *Janajati* and the *Dalit*. According to Table 8.3, however insignificant variation of implementation cost sharing to manage CF among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of four caste/ethnic groups, two caste/ethnic groups are being unable to internalize both the positive and negative externality of CF management in terms of benefits and implementation costs. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If

equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued and implementation costs incurred of CF management by the different caste/ethnic groups, the externalities of CF has not created equity efficiencies within and between the caste/ethnic groups of households in the study area.

Similarly, the benefits from CF and implementation costs of CF management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of Table 8.3 demonstrates the variation of implementation costs incurred in relation with benefits accrued by different income groups of households within and between the income groups. Comparative data of the benefits accrued and implementation costs incurred by different income groups of households indicates that even the rich income groups of households have more involvement in implementation but middle income groups of households have more gross value per household despite to have low implementation cost compared to the rich income groups of households. Contrary to this, poor income group of households has more implementation cost per household than gross value/benefit per household. For example, three income groups of households – rich, middle and poor income groups of households are sharing an average implementation costs by 35.4 percent, 33.3 percent and 31.4 percent respectively while they are getting average gross value per household 45.0 percent, 37.0 percent and 18.0 percent respectively.

This implies that the rich and middle income group of households seems to be active in forest management and utilization activities and hence ensure more likely the higher benefit from CF than the poor income groups of households. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the high implementation costs incurred by them. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the poor income groups of households should take part in overall implementation costs of forest management. Thus, the middle and rich income households are getting more benefit and paying less decision-making costs without any compensation.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (implementation costs) is negatively related to the poor income groups of households. According to Table 8.3, considerable variation of implementation cost sharing to manage CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups one of the poor groups of households is being unable to internalize both the positive and

negative externality of CF management in terms of benefits implementation costs. While middle and rich income groups of households are disproportionately being able to internalize the benefit from CF by externalized the implementation costs on poor income group of households. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the costs (negative externality) on others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefit accrued and implementation costs incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups of households in the study area.

8.1.2.3 Monitoring Cost of Community Forest Management by Caste/Ethnic and Income Groups

Monitoring cost refers to those costs incurred for monitoring and enforcement of agreed-upon rules, record keeping, minute book maintenance financial monitoring of CFUGs and other monitoring related activities. Monitoring costs were simply measured in terms of labour opportunity costs of time spent in different types of forestry monitoring activities. Table 8.4 summarizes the monitoring cost per household among the caste/ethnic groups and income groups of households at the household level based on surveyed households of sixteen CFUGs of four caste and three income groups in category which is presented in detail in the Annex Table 7-G and 8-H.

Table 8.4
Monitoring Cost per Household of CF Management by Caste/Ethnic and Income Groups

(in Nepalese Rupees)

Caste/Ethnic Groups	Income Groups											
	Rich			Middle			Poor			Total Per Household		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	47	50.8	15	17	18.5	18	29	30.8	43	29	24.0
Janajati	29	34	55.5	51	19	31.6	76	8	12.9	156	16	14.0
Newar	10	26	39.9	18	11	17.3	14	28	42.8	42	20	17.0
Brahmin/Chhetri	62	77	50.3	59	37	24.0	37	39	25.7	158	53	45.0
Total Per Household	111	58	56.0	143	25	24.0	145	20	20.0	399	33	100.0

Source: Field Survey, 2003.

*Number of households.

The Table 8.4 illustrates that, among the income groups, average per household share of monitoring cost for each of the rich, medium and poor income groups are Rs.58 (56.0 percent), Rs. 25 (24.0 percent) and Rs.20 (20.0 percent) respectively. The share of household level monitoring cost of CF management is high for rich income group followed by medium income and poor income group. Similarly, among the caste/ethnic groups, average per household share of monitoring cost of forest management is high for *Brahmin/Chhetri* households (Rs.53 or 45.0 percent), followed by *Dalit* (Rs.29 or 24.0 percent), *Newar* (Rs.20 or 17.0 percent) and the *Janajati* (Rs.16 or 14.0 percent) respectively. This means that the monitoring cost sharing between income groups differs invariably and appears uneven while monitoring cost sharing between caste/ethnic groups indicates not positively related with the degree of caste groups (high and low caste). Because *Dalit* households are sharing higher level of average per household monitoring cost than *Newar* and the *Janajati*. However, *Brahmin/Chhetri* households are sharing highest level of average per household monitoring cost.

Within the rich income groups, *Janajati* households are sharing higher level of monitoring cost (55.5 percent) followed by *Dalit* (50.8 percent), *Brahmin/Chhetri* (50.3 percent) and the *Newar* (39.9 percent) respectively. Likewise, within the middle-income groups, *Janajati* households are sharing higher level of monitoring cost (31.6 percent) followed by *Brahmin/Chhetri* (24 percent), *Dalit* (18.5 percent) and the *Newar* (17.3 percent) respectively. Within the poor income groups, *Newar* households are sharing higher level of monitoring cost (42.8 percent) followed by *Dalit* (30.8 percent), *Brahmin/Chhetri* (25.7 percent) and the *Janajati* (12.9 percent) respectively. This means that although the difference in the sharing of monitoring cost by income group is positively related to income status of households but it is not positively related to caste/ethinicity status. Thus, household level sharing of monitoring cost between income group seems relevant but is seems irrelevant between caste/ethnic groups.

Table 8.4 clearly indicates that the difference in monitoring cost sharing by all the caste/ethnic groups is not always so different but the poor income class from all the caste/ethnic groups invariably differs from the other two income groups in this respect. Moreover, it is apparently severe for the different poor income group of households from the all caste/ethnic groups. This indicates that benefits obtained from CF and monitoring cost sharing among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than caste/ethnic groups.

The benefits from CF and monitoring costs of CF management are said to be internalized if each of the caste group of households is made to bear them in full. The summary

statistics of Table 7.4 demonstrates about the variation of monitoring costs incurred in relation with benefits accrued by different caste groups of households within and between the caste/ethnic groups. For example, out of four cast groups, *Brahmin/Chhetri* households are sharing an average monitoring cost by 45.0 percent, followed by *Dalit* 24.0 percent, *Newar* 17.0 percent and the *Janajati* 14.0 percent while they are getting gross value per household by 27.5 percent, 22.5 percent, 28.0 percent and 23.6 percent respectively. Comparative data of the household level gross benefits accrued and monitoring costs incurred by different caste/ethnic groups indicates that even the *Brahmin/Chhetri* have more involvement in monitoring activities i.e. highest monitoring cost with lower gross value per household but *Newar* households have highest gross value per household with lower monitoring cost. Despite to have lowest monitoring cost *Janajati* households have higher gross value per household compared to the *Dalit*. *Dalit* households have more monitoring costs than gross value per household from CF.Thus, *Brahmin/Chhetri* and *Dalit* have completely failed to internalize the benefit from CF as per the monitoring costs incurred and *Newar* and the *Janajati* are disproportionately being able to internalize the benefit from CF by externalized the monitoring costs on the *Brahmin/Chhetri* and *Dalit* particularly on the *Brahmin/Chhetri*. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, *Brahmin/Chhetri* and *Dalit* must have taken part in overall monitoring costs of forest management. Thus, *Newar* and *Janajati* are getting more benefit and paying less monitoring costs without providing any compensation to *Brahmin/Chhetri* and *Dalit*.

Thus, the externality effect of CF in terms of benefits (positive externality) and monitoring costs (negative externality) is negatively related to the so called high caste *Brahmin/Chhetri* and *Dalit*. According to Table 8.4, considerable variation of monitoring cost sharing to manage CF among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of four caste groups, *Brahmin/Chhetri* and *Dalit* are being unable to internalize both the positive and negative externality of CF management in terms of benefits and monitoring costs. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued and monitoring costs incurred of CF use and management by the different caste/ethnic groups of households, the externalities of CF use and management has not created equity efficiencies within and between the caste/ethnic groups in the study area.

Similarly, the benefits from CF use and monitoring costs of CF management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of Table 8.4 demonstrates the variation of benefits accrued and monitoring costs incurred by different income groups of households within and between the income groups. For example, three income groups of households – rich, middle and poor income households are sharing an average monitoring costs by 56.0 percent, 24.0 percent and 20.0 percent respectively while they are getting average gross value/benefit per household 45.0 percent, 37.0 percent and 18.0 percent respectively.

Comparative data of the benefits accrued and monitoring costs incurred by different income groups of households indicates that even the rich income groups of households have more involvement in monitoring activities but they have low gross value per household than the middle income groups of households who have more gross value per household despite to have low monitoring cost. Contrary to this, poor income group of households have low monitoring costs cost per household than the non-poor households but they have lowest average gross value per household than the monitoring cost incurred. In summary, the poor income group of households has more monitoring cost per household than gross value/benefit per household and the rest of other income groups of households have high gross value/benefit per household than monitoring cost per household. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the high monitoring costs incurred by them. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the poor income groups of households should take part in overall monitoring costs of forest management. Thus, the middle and rich income households are getting more benefit and paying less decision-making costs without providing any compensation to the poor income groups of households.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (monitoring costs) is negatively related to the poor income groups of households. According to Table 8.4, considerable variation of monitoring cost sharing to manage CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups the poor group of households is being unable to internalize both the positive and negative externality of CF management in terms of benefits and monitoring costs. While middle and rich income groups of households are disproportionately being able to internalize the benefit from CF by externalized the monitoring costs on poor income group of households. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the costs

(negative externality) on others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefit accrued and monitoring costs incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups of households in the study area.

Table 8.5 summarizes the total transaction cost per household among the caste/ethnic and income groups of households at the household level based on surveyed households of sixteen CFUGs of four caste and three income groups in category which is presented in detail in the Annex Table 8-I and 8-J.

Table: 8.5

Transaction Costs per Household of CF Management by Income and Caste/Ethnic Groups (in Nepalese Rupees)

Income Groups

Caste/Ethnic Groups	Rich			Middle			Poor			Total Per Household		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	1190	37.2	15	1021	31.9	18	989	30.9	43	1047	22.5
Janajati	29	1251	37.3	51	1075	32.0	76	1029	30.7	156	1085	23.4
Newar	10	1242	32.9	18	1258	33.4	14	1271	33.7	42	1259	27.1
Brahmin/Chhetri	62	1365	36.9	59	1227	33.2	37	1108	29.9	158	1253	27.0
Total Per Household	111	1308	37.1	143	1155	32.7	145	1068	30.2	399	1166	100

Source: Field Survey, 2003.

Note: *Number of households.

The Table 8.5 illustrates that, among the income groups, average per household share of total transaction cost for each of the rich, medium and poor income groups are Rs.1,308 (37.1 percent), Rs. 1,155 (32.7 percent) and Rs.1,068 (30.2 percent) respectively. The share of household level total per household transaction cost of CF management is high for rich income group followed by medium income group and poor income group. Similarly, among the caste/ethnic groups, average per household share of total transaction cost of forest management is equally high for *Newar* and *Brahmin/Chhetri* households (Rs.1,259 or 27.1 percent and Rs.1,253 or 27.0 percent) followed by *Janajati* (Rs.1,085 or 23.4 percent) and the *Dalit* (Rs.1,047 or 22.5 percent) respectively. This means that the total transaction cost sharing between income groups differs invariably and appears uneven showing positively related with the degree of income groups while total transaction cost sharing between caste/ethnic groups differs erratically and indicates not positively related with the degree of caste groups (high and low caste). Because

Newar households are sharing higher level of average per household total transaction cost than the *Brahmin/Chhetri* followed by *Janajati* and the *Dalit* households.

Within the rich income groups, *Janajati* households are sharing higher level of average per household total transaction cost (37.3 percent) followed by *Dalit* (37.2 percent), *Brahmin/Chhetri* (36.9 percent) and the *Newar* (32.9 percent) respectively. Likewise, within the middle-income groups, *Newar* households are sharing higher level of total transaction cost (33.4 percent) followed by *Brahmin/Chhetri* (33.2 percent), *Janajati* (32.0 percent) and the *Dalit* (31.9 percent) respectively. Within the poor income groups, *Newar* households are sharing higher level of total transaction cost (33.7 percent) followed by *Dalit* (30.9 percent), *Janajati* (30.7 percent) and the *Brahmin/Chhetri* (29.9 percent) respectively. This means that although the insignificant difference in the sharing of total transaction cost by income group is positively related to income status of households but it is not positively related to caste/ethnicity status. Thus, household level sharing of total transaction cost between income groups seems relevant but it seems irrelevant between caste/ethnic groups.

Table 8.5 clearly indicates that the difference in total transaction cost sharing by all the caste/ethnic groups is not always so different but the poor income class from all the caste/ethnic groups invariably differs, except *Newar* households, from the other two income groups in this respect. However, it is apparently insignificant for the different poor income group of households from the all caste/ethnic groups. This indicates that benefits obtained from CF and total transaction cost sharing among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than caste/ethnic groups.

The benefits from CF and total transaction costs of CF management are said to be internalized if each of the caste group of households is made to bear them in full. The summary statistics of Table 8.5 demonstrates the variation of total transaction costs incurred by different caste/ethnic groups could be viewed in relation with average household level benefits accrued by different caste/ethnic groups. For example, out of four cast/ethnic groups, *Newar* households are sharing an average transaction costs by 27.1 percent followed by *Brahmin/Chhetri* 27 percent, *Janajati* 23.4 percent, and the *Dalit* 22.5 percent while they are getting gross value per household by 28.2 percent, 25.7 percent, 23.6 percent and 22.5 percent respectively**.** Comparative data of the household level gross benefits accrued and total transaction costs incurred by different caste/ethnic groups indicates that *Newar* and *Brahmin/Chhetri* have more involvement in decision making, implementation and monitoring activities in CF management than *Janajati* and the *Dalit* households and hence they have higher gross value per household than *Janajati*

and the *Dalit* households. However, *Brahmin/Chhetri* households have more transaction cost than gross value/benefit per household than rest of the caste/ethnic groups. On the other hand, *Janajati* households have higher total transaction cost and gross value per household compared to *Dalit* households. Despite to have lowest both of total transaction cost and gross value/benefit per household compared to all other caste/ethnic groups, *Dalit* households have seem to be similar between gross benefits accrued and total transaction costs incurred by internalized the benefit and cost because they seem to bear them in full. Only *Brahmin/Chhetri* households have completely failed to internalize the benefit from CF as per the total transaction costs incurred and *Newar* and the *Janajati* households are being able to internalize the benefit from CF by externalized a little bit of total transaction on the *Brahmin/Chhetri* households. Due to non-exclusive characteristics of common property resource management, since even a benefit loser, the *Brahmin/Chhetri* households must have taken part in overall total transaction costs of forest management. Thus, *Newar* and *Janajati* are getting a little bit benefits and paying less total transaction costs without providing any compensation to the *Brahmin/Chhetri* households.

Thus, the externality effect of CF in terms of benefits accrued (positive externality) and total transaction costs incurred (negative externality) is negatively related to the so called high caste *Brahmin/Chhetri* households. According to Table 8.5, although insignificant variation of household level total transaction costs sharing to manage CF among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of four caste/ethnic groups, *Brahmin/Chhetri* households are being unable to internalize both the positive and negative externality of CF management in terms of household level benefits and total transaction costs. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued and transaction costs incurred by the different caste/ethnic groups, the externalities of CF use and management has not created equity efficiencies within and between the caste/ethnic groups in the study area.

Similarly, the benefits from CF use and transaction costs of CF management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of Table 8.5 demonstrates the variation of transaction costs incurred in relation with benefits accrued by different income groups of households within and between the income groups. For example, three income groups of

households-rich, middle and poor income households are sharing an average transaction costs by 37.1 percent, 32.7 percent and 30.2 percent respectively while they are getting average gross value/benefit per household 45.0 percent, 37.0 percent and 18.0 percent respectively.

Comparative data of the benefits accrued and average transaction costs incurred by different income groups of households indicates that the rich income groups of households have more involvement in decision making, implementing and the monitoring activities in the overall management of CF and they have high gross value per household than the middle income groups of households. Contrary to this, poor income group of households have low average transaction costs per household than the non-poor households having lowest average gross value per household than the per household total transaction costs incurred. In summary, the poor income group of households has more total transaction cost per household than gross value/benefit per household and the rest of other income groups of households have more gross value/benefit per household than total transaction cost per household. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the high total transaction costs incurred by them. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the poor income groups of households should take part in overall total transaction costs of forest management. Thus, rich and the middle income households are getting more benefit and paying less total transaction costs without providing any compensation to the poor income groups of households.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (transaction costs) is positively related to the poor and non-poor income groups of households, i.e., low benefit and cost for low income group and high benefits and costs for higher income groups of households. According to Table 8.5, considerable variation of per household transaction costs sharing to manage CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups the poor group of households is being unable to internalize both the positive and negative externality of CF management in terms of benefits and transaction costs. While middle and rich income groups of households are disproportionately being able to internalize the benefit from CF by externalized the transaction costs on poor income group of households. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the costs (negative externality) on others to gain disproportionate benefits (positive externality)

from CF as common property resources. Thus, it is concluded that in case of benefit accrued and transaction costs incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups of households in the study area.

8.1.3 Membership Fees of Community Forest Management by Caste/Ethnic and Income Groups

A membership fee refers the fees required to pay to become a legal and authorized user within the specified CFUG. It is a compulsory fee decided amount by the general assembly of each CFUG to enter into the CFUG. Those users who do not have willingness to pay outright excluded from the forest resource use. Table 8.6 summarizes the membership fees per household among the caste/ethnic groups and income groups of households at the household level based on surveyed households of sixteen FUGs of four caste and three income groups in category which is presented in detail in the Annex table 8-K and 8-L.

Table 8.6

Membership Fees per Household of CF Management by Income and Caste/Ethnic Groups (In Nepalese Rupees)

Income Groups

Caste/Ethnic Groups	Rich			Middle			Poor			Total Per Household		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	260	33.8	15	253	32.9	18	256	33.2	43	256	25.5
Janajati	29	245	34.2	51	241	33.7	76	230	32.1	156	237	23.6
Newar	10	260	34.1	18	239	31.3	14	264	34.6	42	252	25.2
Brahmin/Chhetri	62	250	32.4	59	268	34.7	37	254	32.9	158	258	25.7
Total Per Household	111	250	33.6	143	253	33.2	145	243	33.2	399	249	100.0

Source: Field Survey, 2003.

Note: *Number of households.

Table 8.6 shows that among the caste/ethnic and income groups of households, average per household share of once membership fees for each group appears similar due to being a compulsory fee amount decided by the general assembly of each CFUG to enter into and remaining in the CFUG. However, among the income groups, average per household share of membership fees for each of the rich, medium and poor income groups is Rs.250 (33.6 percent), Rs.253 (33.2 percent) and Rs.243 (33.2 percent) respectively. The share of household level per household membership fees of CF

management is slightly high for rich income group and it is similar to medium income and poor income groups of households. Similarly, among the caste/ethnic groups, average per household share of membership fees of forest management is slightly high for *Brahmin/Chhetri* households (Rs.258 or 25.7 percent) followed by *Dalit* (Rs.256 or 25.5 percent), *Newar* (Rs.252 or 25.2 percent) and the *Janajati* (Rs.237 or 23.6 percent) respectively. This means that the membership fees sharing between income groups differs insignificantly and appears evenly however, showing positively related with the degree of income groups while it is also seems similar between caste/ethnic groups however, indicates not positively related with the degree of caste/ethnic groups (high and low caste). Because *Dalit* households are sharing higher level of average per household membership fees than *Newar* and the *Janajati*.

Within the rich income groups, *Janajati* households are sharing higher level of average per household membership fees (34.2 percent) followed by *Newar* (34.1 percent), *Dalit* (33.8 percent) and the *Brahmin/Chhetri* (32.4 percent) respectively. Within the middle-income groups, *Brahmin/Chhetri* households are sharing higher level of per household membership fees (34.7 percent) followed by *Janajati* (33.7 percent), *Dalit* (32.9 percent) and the *Newar* (31.3 percent) respectively. Within the poor income groups, *Newar* households are sharing higher level of per household membership fees (34.6 percent) followed by *Dalit* (33.2 percent), *Brahmin/Chhetri* (32.9 percent) and the *Janajati* (32.1 percent) respectively. This means that although the insignificant difference in the sharing of per household membership fees by income group is positively related to income status of households but it is not positively related to caste/ethnicity status. Thus, household level sharing of per household membership fees between income groups seems somehow relevant but it seems irrelevant between caste/ethnic groups.

Table 8.6 clearly indicates that the difference in per household membership fees sharing by all the caste/ethnic groups is not always so different but the poor income class from all the caste groups differs insignificantly, except the *Newar* households, from the other two income groups in this respect. However, it is apparently insignificant difference for the different poor income group of households from the all caste/ethnic groups. This indicates that benefits per household obtained from CF and per household membership fees sharing among the income groups is somehow positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than caste/ethnic groups.

The benefits from CF and membership fees of CF management are said to be internalized if each of the caste group of households is made to bear them in full. The summary statistics of Table 8.6 demonstrates the variation of benefits accrued and

membership fees incurred by different caste/ethnic groups of households within and between the caste/ethnic groups. For example, out of four cast/ethnic groups, average per household share of membership fees of forest management is slightly high for *Brahmin/Chhetri* households (25.7 percent) followed by *Dalit* (25.5 percent) *Newar (*25.2 percent) and the *Janajati* (23.6 percent) respectively while they are getting gross value/benefit per household by (25.7 percent), (22.5 percent), (28.2 percent) and (23.6 percent) respectively**.** Comparative data of the household level gross benefits accrued and membership fees **i**ncurred by different caste/ethnic groups indicates that *Brahmin/Chhetri* and *Dalit* households are paying slightly more membership fees than *Newar* and the *Janajati* but *Brahmin/Chhetri* has lower per household gross value/benefit than the *Newar* households. On the other hand, *Newar* households have higher per household gross value/benefit than the membership fees. *Dalit* households have lowest per household gross value/benefit than the rest of all other households. However, both of *Brahmin/Chhetri* and *Janajati* have equal membership fees with their per household gross value/benefits. They appear internalized the benefits and costs because they seem to bear them in full. Only the *Dalit* households have failed to internalize the benefit from CF as per the membership fees paid by them. *Newar* households are absolutely being able to internalize the benefit from CF by externalized the membership fees on the Dalit households. Due to non-exclusive characteristics of common property resource management, since even a benefit loser, the *Dalit* households must have taken part in overall membership fees of forest management. Thus, the *Newar* households are getting more benefits and paying less membership fees without providing any compensation to the *Dalit* households.

According to Table 8.5, although insignificant variation of household level sharing of membership fees to manage CF among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be efficient for the *Brahmin/Chhetri* and *Janajati* and it seems likely to be inefficient for the *Newar* and *Dalit*. Because out of four caste groups, *Brahmin/Chhetri* and *Janajati* households are being unable to internalize both the positive and negative externality of CF management in terms of household level benefits and membership fees. Contrary to this, *Newar* households are absolutely being able to internalize the benefit from CF by externalized the membership fees on the *Dalit* because *Dalits* have completely failed to internalize the benefit from CF as per the membership fees paid by them. Enjoying the benefits according to burdening the costs/fees is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources.

Thus, it is concluded that in case of benefits accrued and membership fees incurred of CF use and management by the different caste/ethnic groups, the externalities of CF use and management has not created equity efficiencies within and between the caste/ethnic groups in the study area.

Similarly, among the income groups, the benefits from CF use and membership fees of CF management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of the above Table 8.6 demonstrates the variation of membership fees incurred in relation with benefits accrued by different income groups of households within and between the income groups. For example, three income groups of households–rich, middle and poor income households are sharing an average membership fees by 33.6 percent, 33.2 percent and 33.2 percent respectively while they are getting average gross value/benefit per household 45.0 percent, 37.0 percent and 18.0 percent respectively.

Comparative data of the per household benefits accrued and membership fees incurred by different income groups of households indicates that all the income groups of households are paying similar amount of membership fees to enter into and remaining in CFUG. However, this fee is slightly high for the rich income groups than the middle and the poor income groups of households. Contrary to this, rich households have high gross value/benefit per household than the middle income groups of households. Ironically, poor income group of households have low gross value/benefit per household than the non-poor households. In summary, the poor income group of households has more per household membership fees than gross value/benefit per household than the non-poor income groups of households. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the high per household membership fees incurred by them. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the poor income groups of households should take part in overall membership fees of forest management. Thus, rich and the middle income households are getting more benefit and paying less membership fees without providing any compensation to the poor income groups of households.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (membership fees) is seen positively related to the poor and non-poor income groups of households i.e. low benefit and cost for low income group and high benefits and costs for higher income groups of households. According to Table 8.6, considerable variation of per household membership fees sharing to manage CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups the poor group of households is being

unable to internalize both the positive and negative externality of CF management in terms of benefits and membership fees. While rich and middle income groups of households are disproportionately being able to internalize the benefit from CF by externalized the membership fees on poor income group of households. Enjoying the benefits according to burdening the fees/costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the fees/costs (negative externality) on others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefit accrued and membership fees incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups of households in the study area.

8.1.4 Gross Cost of Use and Management of Community Forest by Caste/Ethnic and Income Groups

To get the gross cost for each economic group, these three costs were added in each case. The cost incurred by households were quantified and averaged to represent the cost per household for each caste and income groups. Table 8.7 summarizes the gross cost per household among the caste groups and income groups of households at the household level based on surveyed households of sixteen CFUGs of four caste and three income groups in category which is presented in detail in the Annex Table 8-M and 8-N.

Table 8.7

Gross Cost per Household of Use and Management of CF by Income and Caste/Ethnic Groups (in Nepalese Rupees)

Caste/Ethnic Groups	Income Groups											
	Rich			Middle			Poor			Total Per Household		
	N*	NRs	%	N*	NRs	%	N*	NRs	%	N*	NRs	%
Dalit	10	4,684	40.3	15	4,338	37.3	18	2,608	22.4	43	3,694	23.4
Janajati	29	5,172	42.5	51	4,467	36.7	76	2,534	20.8	156	3,656	23.1
Newar	10	4,942	39.3	18	4,703	37.4	14	2,915	23.2	42	4,164	26.3
Brahmin/Chhetri	62	5,011	40.7	59	4,433	36.0	37	2,882	23.4	158	4,297	27.2
Total Per Household	111	5,017	41.0	143	4,469	37.0	145	2,669	22.0	399	3,967	100.0

Source: Field Survey, 2003.

Note: *Number of households.

Table 8.7 illustrates that, among the income groups, average per household share of total gross cost for each of the rich, medium and poor income groups are Rs.5,017 (41.0 percent), Rs. 4,469 (37.0 percent) and Rs.2,669 (22.0 percent) respectively. The share of household level total per household gross cost of CF use and management is high for rich income group followed by medium income group and poor income group. Similarly, among the caste/ethnic groups, average per household share of total gross cost of forest use and management is high for *Brahmin/Chhetri* households Rs. 4,297or (27.2 percent) followed by *Newar* Rs. 4,164 or (26.3 percent), *Dalit* Rs. 3,694 or (23.4 percent) and the *Janajati* Rs. 3,656 or (23.1 percent) respectively. This means that the total gross cost sharing between income groups differs invariably and appears uneven showing positively related with the degree of income groups while total gross cost sharing between caste/ethnic groups differs inconsistently and indicates not positively related with the degree of caste/ethnic groups (high and low caste). Because *Dalit* households are sharing higher level of average per household total gross cost than *Janajati*. However, *Brahmin/Chhetri* households are sharing higher level of average per household total gross cost than rest of other caste/ethnic groups with insignificant variation.

Within the rich income groups, *Janajati* households are sharing higher level of average per household total gross cost (42.5 percent) followed by *Brahmin/Chhetri* (40.7 percent), *Dalit* (40.3 percent) and the *Newar* (39.3 percent) respectively. Likewise, within the middle-income groups, *Newar* households are sharing higher level of total gross cost (37.4 percent) followed by *Dalit* (37.3 percent), *Janajati* (36.7 percent) and the *Brahmin/Chhetri* (36.0 percent) respectively. Within the poor income groups, *Brahmin/Chhetri* households are sharing higher level of total gross cost (23.4 percent) followed by *Newar* (23.2 percent), *Dalit* (22.4 percent) and the *Janajati* (20.8 percent) respectively. This means that invariably difference in the sharing of total gross cost by income group is positively related according to income status from all the caste/ethnic groups while although the insignificant variation in the sharing of total gross cost by caste/ethnic groups is not positively related according to caste/ethnicity status from all the income groups. Thus, household level sharing of total gross cost between income groups seems positively related and is relevant but it seems not positively related between caste/ethnic groups and so it is irrelevant.

Table 8.7 clearly indicates that the difference in total gross cost sharing by all the caste/ethnic groups is not always so different according to caste/ethnic status but the poor income class from all the caste/ethnic groups invariably differs from the other two income groups in this respect. Moreover, it is apparently severe for the different poor income group of households from the all caste/ethnic groups. However, it appears that the variation of household level sharing of total gross cost within income and

caste/ethnic groups is insignificant from the all caste/ethnic groups and income groups as well. This indicates that benefits obtained from CF and total gross cost sharing among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than caste/ethnic groups.

The benefits from CF and total gross cost of CF management are said to be internalized if each of the caste/ethnic group of households is made to bear them in full. The summary statistics of Table 7.7 demonstrates the variation of total gross cost incurred in relation with benefits accrued by different caste/ethnic groups of households within and between the caste/ethnic groups of households seems uneven and inconsistent. For example, out of four cast/ethnic groups, *Brahmin/Chhetri* households are sharing an average gross cost by (27.2 percent) followed by *Newar* (26.3 percent), *Dalit* (23.4 percent) and the *Janajati* (23.1 percent) respectively while they are getting gross value per household by (25.7 percent), (28.2 percent), (22.5 percent) and (23.6 percent) respectively**.** Comparative data of the household level gross benefits accrued and share of labour cost, total transaction cost and membership fees to total gross cost per household incurred by different caste/ethnic groups of households indicates that *Brahmin/Chhetri* groups of households have more involvement in forest product harvesting from CF than decision making, implementation and monitoring activities in CF management than the *Newar* and hence they have higher gross cost per household than the *Newar*. However, even the *Brahmin/Chhetri* households have more gross cost than rest of the caste/ethnic groups, *Newar* households have more gross value/benefit per household than rest of the caste/ethnic groups. On the other hand, *Dalit* households have higher gross cost than the *Janajati* and lowest gross value/benefit than rest of the caste/ethnic groups. Thus, *Brahmin/Chhetri* and the *Dalit* have higher total gross cost per household than gross value/benefit per household. *Newar* and the *Janajati* have higher gross value/benefit per household than total gross cost per household. Therefore, *Brahmin/Chhetri* and the *Dalit* have completely failed to internalize the benefit from CF as per the total gross cost per household incurred and *Newar* and the *Janajati* are being able to internalize the benefit from CF by externalized the total gross cost on *Brahmin/Chhetri* and the *Dalit*. Due to non-exclusive characteristics of common property resource management, since even a benefit loser, *Brahmin/Chhetri* and *Dalit* must have taken part in overall total gross cost of forest use, operation and management. Thus, *Newar* and *Janajati* are getting higher benefits and paying less total gross cost per household without providing any compensation to *Brahmin/Chhetri* and *Dalit* households.

Thus, the externality effect of CF in terms of benefits accrued (positive externality) and total gross cost incurred (negative externality) is negatively related to the so called high caste *Brahmin/Chhetri*. According to Table 8.7, although insignificant variation of

household level total gross cost sharing to use and manage of CF among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of four caste/ethnic groups, *Brahmin/Chhetri* and the *Dalit* are being unable to internalize both the positive and negative externality of CF use and management in terms of household level benefits and total gross costs. On the other hand, enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued and gross cost incurred of CF use and management by the different caste/ethnic groups, the externalities of CF use and management has not created equity efficiencies within and between the caste/ethnic groups in the study area.

Similarly, the benefits from and gross costs of CF use management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of Table 8.7 reveals the fact that household level variation of benefits accrued and gross costs incurred by different income groups of households within and between the income groups seems to be uneven. For example, three income groups of households-rich, middle and poor income households are sharing an average gross cost by (41.0 percent), (37.0 percent) and (22.0 percent) respectively while they are getting per household gross value/benefit (45.0 percent), (37.0 percent) and (18.0 percent) respectively.

Comparative data of the benefits accrued and average gross cost incurred by different income groups of households indicates that the rich income groups of households have more involvement in the overall forestry activities and they have high gross value per household than the middle income groups of households. Contrary to this, poor income group of households have low average gross cost per household than the non-poor households having lowest average gross value per household than the per household total gross cost incurred. In summary, the poor income group of households has more total gross cost per household than gross value/benefit per household and the non-poor groups of households have high gross value/benefit per household than total gross cost per household. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the total gross cost incurred by them. Due to non-exclusive characteristics of common property resource management, since even a benefit loser, the poor income groups of households must have taken part in overall total gross costs of forest use and management. Thus, rich and the middle income households are

getting more benefit and paying fewer total per household gross cost without providing any compensation to the poor income groups of households.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (gross cost transaction costs) is positively related to the poor and non- poor income groups of households i.e. low benefit and cost for low income group and high benefits and costs for higher income groups of households. According to Table 8.7, considerable variation of per household gross cost sharing to use and manage of CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups, the poor group of households is being unable to internalize both the positive and negative externality of CF use management in terms of gross benefits and gross cost. While rich and middle income groups of households are disproportionately being able to internalize the benefit from CF by externalized the gross cost on poor income group of households. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the costs (negative externality) on others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefit accrued and gross cost incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups of households in the study area.

8.1.5 Comparative Costs Analysis by Caste/Ethnic and Income Groups

Table 8.8 summarizes the labour costs and membership fees of forest use and transaction costs of forestry operation based on surveyed households of sixteen CFUGs of four caste/ethnic groups in category which are presented in detail in the annex tables 8-A, 8-I and 8-K. The Annex Tables also reveal numerous interesting remarks regarding the relative and absolute per household share of different types of cost incurred by differentcaste/ethnic groups of households within and between the groups of each CFUG.

Table 8.8

Labour Cost, Transaction Costs and Membership Fees per Household by Caste/Ethnic Groups (in Nepalese Rupees)

Caste/Ethnic Groups	Average Costs						Total Average Gross Cost	
	Labour Cost		Transaction Cost		Membership Fees			
	NRs.	%	NRs.	%	NRs.	%	NRs.	%
Dalit (N*=43)	2,392	64.7	1,047	28.4	256	6.9	3,694	100.0
Janajati (N*=156)	2,334	63.8	1,085	29.7	237	6.5	3,656	100.0
Newar (N*=42)	2,653	63.7	1,259	30.2	252	6.1	4,164	100.0
Brahmin/Chhetri (N*=158)	2,786	64.8	1,253	29.2	258	6.0	4,297	100.0
Average Cost	2,553	64.3	1,166	29.4	249	6.3	3,967	100.0

Source: Computed from Annex Tables 8-A, 8-I and 8-K.

*Number of Households

Table 8.8 shows that average labour cost is more than two times higher than the average transaction cost of and membership fees is around 6.5 percent to total cost of forestry operation and management for all the caste/ethnic groups. Among the caste/ethnic groups, most caste/ethnic groups are appeared bearing a similar but largest fraction of labour costs than transaction cost and the membership fees. However, *Brahmin/Chhetri* households are bearing a largest fraction of labour costs (64.8 percent) followed by *Dalit* (64.7 percent), *Janajati* (63.8 percent) and the *Newar* (63.7 percent) respectively. This implies that most forest product harvesting is labour intensive activities in rural area and most rural households are yet depending on biomass for their daily energy requirement. Similarly, most caste/ethnic groups are appeared bearing a similar fraction of transaction cost. Despite that, the *Newar* households have higher fraction of transaction cost (30.2 percent) followed by *Janajati* (29.7 percent), *Brahmin/Chhetri* (29.2 percent) and the *Dalit* (28.4 percent) respectively. Contrary to this, *Dalit* households are appeared paying a high fraction of membership fees (6.9 percent) followed by *Janajati* (6.5 percent), *Newar* (6.1 percent) and the *Brahmin/Chhetri* (6.0 percent) respectively. Thus, percentage shares of membership fees are not so different around 6.5 percent to total cost which was raised as a compulsory entrance fees equal to all the identified members of CFUGs.

This means that *Newar* and *Janajati* households seem to be active in forest management and utilization activities due to high share of transaction cost than *Brahmin/Chhetri* and the *Dalit* households. Low level of transaction costs for *Brahmin/Chhetri* and *Dalit*

compared to *Newar* and *Janajati* households is an indication of low level of leadership in the management of CF and hence ensures more likely the lower benefit from CF. This has been justified by the benefit-cost analysis in section 8.3 of the chapter eight that due to have the lower average transaction cost of *Brahmin/Chhetri* and *Dalit* (29.2. percent and 28.4 percent) than *Newar* and the *Janajati* (30.2 percent and 29.7 percent), per household gross benefits received by *Brahmin/Chhetri* and *Dalit* are low (25.7 percent and 22.5 percent) than *Newar* and the *Janajati* households (28.2 percent and 23.6 percent). Hence, *Brahmin/Chhetri* and *Dalit* have negative net benefit (-1.5 and –0.9) with less than one B/C ratio (0.94 and 0.96) and *Newar* and the *Janajati* have positive net benefits (1.9 and 0.5) with more than one B/C ratio (1.07 and 1.02).

However, transaction costs including membership fees were forced after community forestry. This means that this is an obligatory cost of common property forest resource management to be remaining a legal and authorized member to use forest resources at subsistence scale from CF by all caste/ethnic groups as this was not a necessity when the forest was *de facto* an open access prior to management of forest by local community user groups.

Table 8.9 summarizes the labour costs and membership fees of forest use and transaction costs of forestry operation based on surveyed households of sixteen CFUGs of three income groups in category which are presented in detail in the annex tables 8-B, 8-J and 8-L. The Annex Tables also reveal numerous interesting remarks regarding the relative and absolute per household share of different types of cost incurred by income groups of households within and between the groups of each FUG.

Table 8.9

Labour Cost, Transaction Costs and Membership Fees per Household by Income Groups (in Nepalese Rupees)

Income Class	Average Costs						Total Average Gross Cost	
	Labour Cost		Transaction Cost		Membership Fees			
	NRs.	%	NRs.	%	NRs.	%	NRs.	%
Rich (N*=111)	3,458	69.0	1,308	26.0	250	5.0	5,017	100.0
Middle (N*=143)	3,061	68.5	1,115	25.8	253	5.7	4,469	100.0
Poor (N*=145)	1,359	50.9	1,068	40.0	243	9.1	2,669	100.0
Average Costs	2,553	64.3	1,166	29.4	249	6.3	3,967	100.0

Source: Computed from Annex Tables 7-B, 7-J and 7-L.

*Number of Households

Table 8.9 shows that average labour cost is two times higher than the average transaction cost of forestry operation and management for all income groups. While average membership fees is less than 1 percent to total cost. The table shows clearly that within the income groups all are appeared bearing a largest fraction of average labour costs (64.3 percent) followed by transaction cost (29.4 percent) and membership fees (6.3 percent) respectively. However, households from the poor income group have bearing relatively higher transaction cost than the households of rich and middle-income groups. It can be said that out of total cost, 31.0 percent for rich income group, 31.5 percent for middle income group and 49.1 percent for poor income group are attributed to transaction costs including membership fees which was forced after community forestry. A very high level of transaction costs to poor income groups compared to rich and middle- income group is an indication of disproportionate shares in implementation activities rather than decision-making and monitoring activities by poor income groups than rich and medium income groups do. However, this implies that poor income group seems to be active in forest implementation activities rather than overall forest management and utilization activities than the rich and medium groups of households. The great variation of share of transaction cost between poor and non-poor households indicates the differences in scale of forest management. However, this difference means that the higher intensity of forest management may not always need higher transaction costs in meetings and decision-making. It may not be true that higher transaction cost leads leadership in meetings implementation and decision-making activities and hence ensures more likely the higher benefit from CF. This has been justified by the benefit – cost analysis in section 7.3 of the chapter seven that even to have the lower average transaction cost of non-poor households (26.0 percent and 25.8 percent) than the poor households (40.0 percent), the gross benefits received by the rich and middle income groups of households are high (45.0 percent and 37.0 percent) than the poor households (18.0 percent per household). Hence, the non-poor households have positive and zero net benefit (4 and 0) with more than one and equal to one B/C ratio (1.09 and 1.0) and the poor income households have negative net benefit (-3) with less than one B/C ratio (0.81).

Thus, the transaction costs including membership fees seems an obligatory cost of common property forest resource management to be remaining a legal and authorized member to use forest resources at subsistence scale from CF by all income groups as this was not a necessity when the forest was *de facto* an open access prior to management of forest by local community user groups.

8.2 Benefits of Community Forest Management by Caste/Ethnic and Income Groups

As mentioned in methodology section of chapter one, gross value/benefits (income) of community forests refers total annual community forest (CF) gross income received to be involved in forestry activities by all the caste and income groups of households of sixteen different forest users groups in the study area. To estimate the economic value of different forest products the market price, barter method and opportunity cost approach were used. Household level benefits derived from community forest by the local users were calculated by valuing the different forest product collected and harvested from forest areas. The economic value of different forest based products such as fuel wood, fodder, green grass, dry litter, green leaf litter, small tree pool for vegetable and timber for plough, house and animal shed construction by local user households were estimated. In the entire study site, these all are the potential forest products significantly contribute to the local level household economy. Details of benefit calculation (per household per year benefit based on four caste/ethnic and three income groups of sixteen surveyed CFUGs) are discussed in chapter 7.

following Table 8.10 summarizes the household level gross value/benefits among the caste/ethnic groups and income groups of households based on surveyed households of sixteen CFUGs of four caste/ethnic and three income groups in category which is presented in detail in the Annex Table 8-M and 8-N.

Table 8.10

Gross Value/Benefit (Income) per Household of CF by Income and Caste/Ethnic Groups

Income Groups

Caste/Ethnic Groups	Rich			Medium			Poor			Total and Average		
	N#	NRs*	Percent	N#	NRs*	Percent	N#	NRs*	Percent	N#	NRs*	Percent
Dalit	10	6,669	41.0	15	6,528	40.0	18	3,057	19.0	43	5,108	22.5
Janajati	29	9,004	48.0	51	6,743	36.0	76	3,063	16.0	156	5,370	23.6
Newar	10	9,104	46.0	18	7,207	37.0	14	3,410	17.0	42	6,393	28.2
Brahmin/Chhetri	62	7,184	43.0	59	5,816	35.0	37	3,615	22.0	158	5,837	25.7
Total and Average	111	7,786	45.0	143	6,397	37.0	145	3,236	18.0	399	5,635	100.0

Source: Field Survey, 2003

Note: # Number of households.

* Nepalese Rupees.

Table 8.10 illustrates the contribution of community forests in terms of average gross value/benefits per household of different caste/ethnic and income groups of households from community forests in the study area. Among the income groups, average per household share of gross value/benefits for each of the rich, medium and poor income groups are Rs.7,786 (45.0 percent), Rs.6,397 (37.0 percent) and Rs.3,236 (18.0 percent) respectively. The share of household level gross value/benefits from CF is high for rich income group followed by medium income and poor income groups of households. Similarly, among the caste/ethnic groups, average per household share of gross value/benefits from CF is high for *Newar* households Rs.6, 393 or (28.2 percent) followed by *Brahmin/Chhetri* (Rs.5, 837 or (25.7 percent), *Janajati* Rs.5, 370 or (23.6 percent) and the *Dalit* Rs.5, 108 or (22.5 percent) respectively. This means that the gross value/benefits sharing between income groups differs invariably and appears uneven showing positively related with the degree of income groups while gross value/benefits sharing between caste/ethnic groups differs inconsistently and indicates not positively related with the degree of caste/ethnic groups (high and low caste). Because *Newar* households have higher level of average per household gross value/benefits than rest of the caste/ethnic groups. However, *Brahmin/Chhetri* households are getting higher level of per household gross value/benefits than *Janajati* and *Dalit* with insignificant variation.

Within the rich income groups, *Janajati* households have higher level of average per household gross value/benefits (48.0 percent) followed by *Newar* (46.0 percent), *Brahmin/Chhetri* (43.0 percent), and the *Dalit* (41 percent) respectively. Within the middle-income groups, *Dalit* households have higher level of gross value/benefits (40.0 percent) followed by *Newar* (37.0 percent), *Brahmin/Chhetri* (35.0 percent) and the *Janajati* (36.0 percent) respectively. Within the poor income groups, *Brahmin/Chhetri* households have higher level of gross value/benefits (22.0 percent) followed by *Dalit* (19.0 percent), *Newar* (17.0 percent) and the *Janajati* (16.0 percent) respectively. This means that invariably difference in the sharing of gross value/benefits by income group is positively related according to income status from all the caste/ethnic groups while although the significant variation in the sharing of gross value/benefits by caste/ethnic groups is not positively related according to caste/ethnic status from all the income groups. Thus, household level sharing of gross value/benefits between income groups seems relevant positively related to income status but it seems irrelevant positively related to caste/ethnic status. Table 8.10 clearly indicates that the difference in gross value/benefits sharing by all the caste/ethnic groups is not always so different according to caste/ethnic status but the poor income class from all the caste/ethnic groups invariably differs from the other two income groups in this respect. Moreover, it is apparently severe for the different poor income group of households from the all

caste/ethnic groups. However, it appears that the variation of household level sharing of gross value/benefits within income and caste/ethnic groups is significant from the all caste/ethnic groups and income groups as well. This indicates that the household level benefits obtained from CF and total gross cost sharing among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than caste/ethnic groups.

The gross benefits from CF and total gross cost of CF management are said to be internalized if each of the caste group of households is made to bear them in full. The summary statistics of Table 8.10 demonstrates the variation of household level benefits accrued in relation with total gross cost incurred by different caste/ethnic groups of households within and between the caste/ethnic groups of households seems uneven and inconsistent. For example, out of four cast/ethnic groups, *Brahmin/Chhetris* are sharing an average gross cost by (27.2 percent) followed by *Newar* (26.3 percent), *Dalit (*23.4 percent) and the *Janajati* (23.1 percent) respectively while they are getting gross value per household by (25.7 percent), (28.2 percent), (22.5 percent) and (23.6 percent) respectively**.** Comparative data of the household level gross benefits accrued and share of labour cost, total transaction cost and membership fees to total gross cost per household incurred by different caste/ethnic groups indicates that *Brahmin/Chhetris* have more involvement in forest product harvesting from CF than decision making, implementation and monitoring activities in CF management than the *Newar* and hence they have higher gross cost per household than the *Newar*. However, even the *Brahmin/Chhetri* households have more gross cost than rest of the caste/ethnic groups, *Newar* households have more gross value/benefit per household than rest of the caste/ethnic groups. On the other hand, *Dalit* households have higher gross cost than *Janajati* and lowest gross value/benefit than rest of the caste/ethnic groups. Thus, *Brahmin/Chhetri* and the *Dalit* have higher total gross cost per household than per household gross value/benefit. *Newar* and the Janajati have higher per household gross value/benefit per household than total gross cost. Therefore, *Brahmin/Chhetri* and the *Dalit* have completely failed to internalize the benefit from CF as per the total gross cost per household incurred and *Newar* and the *Janajati* are being able to internalize the benefit from CF by externalized the total gross cost on *Brahmin/Chhetri* and the *Dalit*. Due to non-exclusive characteristics of common property resource management, since even a benefit loser, *Brahmin/Chhetri* and the *Dalit* must have taken part in overall total gross cost of forest use, operation and management. Thus, *Newar* and *Janajati* households are getting higher level of benefits and paying less per household total gross cost without providing any compensation to *Brahmin/Chhetri* and *Dalit* households.

Thus, the externality effect of CF in terms of benefits accrued (positive externality) and total gross cost incurred (negative externality) is negatively related to the so called high caste *Brahmin/Chhetri*. According to Table 8.10, significant variation of household level gross value/benefit sharing among the caste/ethnic groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of four caste/ethnic groups, *Brahmin/Chhetri* and the *Dalit* are being unable to internalize both the positive and negative externality of CF use and management in terms of household level benefits and total gross costs. On the other hand, *Newar* and the *Janajati* households are enjoying more benefits than burdening the costs from the management of common property resources and hence they are being able to internalize both the positive and negative externality of CF use and management in terms of household level benefits and total gross costs. If equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued and gross cost incurred of CF use and management by the different caste/ethnic groups, the externalities of CF use and management has not created equity efficiencies within and between the caste/ethnic groups in the study area.

Similarly, the benefits from and gross costs of CF use management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of Table 8.10 demonstrates the household level variation of benefits accrued in relation with gross costs incurred by different income groups of households within and between the income groups. For example, three income groups of households-rich, middle and poor income households are getting per household average gross value/benefit by (45.0 percent), (37.0 percent) and (18.0 percent) while they are sharing per household average gross costs by (41.0 percent), (37.0 percent) and (22.0 percent) respectively.

Comparative data of the benefits accrued and average gross cost incurred by different income groups of households indicates that the rich income groups of households have more involvement in the overall forestry activities and they have high gross value per household than the middle income groups of households. Contrary to this, poor income group of households have low average gross cost per household than the non-poor households having lowest average gross value per household than the per household total gross cost incurred. In summary, the poor income group of households has more gross cost per household than gross value/benefit per household and the non-poor groups of households have high per household gross value/benefit than per household gross cost. Thus, the poor income groups of households have completely failed to internalize the benefit from CF as per the total gross cost incurred by them. Due to non-exclusive

characteristics of common property resource management, since even a benefit loser, the poor income groups of households must have taken part in overall total gross costs of forest use and management. Thus, rich and the middle income households are getting more benefit and paying less per household total gross cost without providing any compensation to the poor income groups.

Thus, the externality effect of CF in terms of positive externality (benefits) and the negative externality (gross cost transaction costs) is positively related to the poor and non- poor income groups of households i.e. low benefit and cost for poor income group and high benefits and costs for higher income groups of households. According to table 8.10, substantial variation of per household gross value/benefit sharing from CF among the income groups indicates that equity outcome of CF management seems likely to be inefficient. Because out of three income groups, the poor group of households are getting less benefits than the costs and hence they are being unable to internalize both the positive and negative externality of CF use management in terms of gross benefits and gross cost. While rich and middle income groups of households are disproportionately getting more benefits than the costs and hence they are being able to internalize the benefit from CF by externalized the gross cost on poor income group of households. Enjoying the benefits according to burdening the costs is the central notion of internalization of positive and negative externality from the management of common property resources. If equity outcome of CF management would be in place, nobody could externalize the costs (negative externality) on others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefit accrued and gross cost incurred of CF use and management by different income groups of households, the externalities of CF has not created equity efficiencies within and between the income groups in the study area.

8.3 Benefit-Cost Analysis of Community Forest Management by Caste/Ethnic and Income Groups

8.3.1 Net Benefits of Community Forest Management by Caste/Ethnic and Income Groups

Tables 8.11a and 8.11b summarize the household level net benefits for each caste/ethnic and income group of the sixteen CFUGs based on preceding discussions in section 6.6.1.1.3 to 6.6.1.2.4 of chapter six and calculations made from the relevant data of Annex Tables 8-M, 8-N, 8-O and 8-P. The details of gross benefits, gross cost and net benefit distribution to four caste/ethnic and three income groups of surveyed households of sixteen CFUGs are presented in detail in Annex Tables 8-M, 8-N, 8-O and 8-P. The net benefit from forest products was estimated in Nepalese rupees and calculated as gross

value (income) accrued minus total gross cost (labour costs + transaction costs + membership fee) incurred by forest resource user households.

Table 8.11a

Net Benefits (Income) per Household from CF by Caste/Ethnic and Income Groups (in Nepalese Rupees)

Income Groups

Caste/Ethnic Groups	Rich			Medium			Poor			Average of Caste Groups		
	Gross Benefits	Gross Costs	Net Benefits	Gross Benefits	Gross Costs	Net Benefits	Gross Benefits	Gross Costs	Net Benefits	Gross Benefits	Gross Costs	Net Benefits
Dalit	6,669	4,684	1,985	6,528	4,338	2,190	3,057	2,608	449	5,108	3,694	1,414
Janajati	9,004	5,172	3,832	6,743	4,467	2,276	3,063	2,534	529	5,370	3,656	1,714
Newar	9,104	4,942	4,262	7,207	4,703	2,504	3,410	2,915	495	6,393	4,164	2,229
Brahmin/Chhetri	7,184	5,011	2,173	5,816	4,433	1,383	3,615	2,882	733	5,837	4,297	1,540
Average of Income Groups	7,786	5,017	2,769	6397	4,469	1928	3,236	2,669	567	5,635	3,967	1,668

Source: Computed from Annex Tables 8-M, 8-N, 8-O and 8-P.

Table 8.11b

Net benefits (income) per household from CF by Caste Ethnic and Income and groups

(In Percentage) **(in Nepalese Rupees)**

Income Groups

Caste Groups	Rich			Medium			Poor			Average of Caste Groups		
	Gross Benefits	Gross Costs	Net Benefits	Gross Benefits	Gross Costs	Net Benefits	Gross Benefits	Gross Costs	Net Benefits	Gross Benefits	Gross Costs	Net Benefits
Dalit	41.0	40.3	0.7	40.0	37.3	2.7	19.0	22.4	-3.4	22.5	23.4	-0.9
Janajati	48.0	42.5	5.5	36.0	36.7	-0.7	16.0	20.8	-4.8	23.6	23.1	0.5
Newar	46.0	39.3	6.7	37.0	37.4	-04	17.0	23.2	-6.2	28.2	26.3	1.9
Brahmin/Chhetri	43.0	40.7	2.3	35.0	36.0	-1	22.0	23.4	-1.4	25.7	27.2	-1.5
Average of Income Groups	45.0	41.0	4.0	37.0	37.0	0.0	18.0	22.0	-4.0	-	-	-

Source: Computed from Table 8.11a.

Table 8.11a and 8.11.b illustrates the contribution of community forests in terms of average net benefits per household per year for different caste/ethnic and income groups of household from community forests in the study area. Table 8.11a shows the difference between average per household gross value and gross cost or the average per household net benefits among the caste/ethnic and income groups of households. On an average, average per household net benefits for each of the rich, medium and poor income groups

are Rs.2, 769, Rs.1, 928 and Rs.567 respectively. Similarly, it is for each of the *Brahmin/Chhetri, Newar, Janajati* and the *Dalit* groups are NRs 1,540, Rs2, 229, Rs1,714 and Rs1,414 respectively. Likewise, Table 7.11b shows the percentage difference between average per household gross value and gross cost or the average per household net benefits among the caste/ethnic and income groups of households. On an average, average percentage of per household net benefits for each of the rich, medium and poor income groups are (4.0 percent), (0.0 percent) and (-4.0 percent) respectively. Similarly, it is for each of the *Brahmin/Chhetri, Newar, Janajati* and the *Dalit* are (-1.5 percent), (1.9 percent), (0.5 percent) and (-0.9 percent) respectively. Table 8.11b indicates that the average percentage share of household level net benefits from CF is high for rich income group, zero for medium income group and negative for poor income groups of households. Similarly, among the caste/ethnic groups, it is high for *Newar* and *Janajati* and negative for *Brahmin/Chhetri* and the *Dalit*. This means that the percentage distribution of net benefits between income groups differs invariably and appears uneven showing positively related with the degree of income groups while the percentage distribution of net benefits between caste/ethnic groups differs inconsistently and indicates not positively related with the degree of caste/ethnic groups (high and low caste) because *Newar* households have positively higher percentage of average per household net benefits followed by *Janajati. Brahmin/Chhetri* and the *Dalit* have negatively lower percentage of average per household net benefits.

Within the rich income groups, all the caste/ethnic groups have higher percentage of average per household gross benefits than gross costs or net benefits. *Newar* households have higher level of average per household net benefits (6.7 percent) followed by *Janajati* (5.5 percent), *Brahmin/Chhetri* (2.3 percent) and the *Dalit* (0.7 percent) respectively. Within the middle-income groups, only the *Dalit* households have higher percentage of net benefits (2.7 percent) and rest of all have negative net benefits i.e. *Newar* (-0.4 percent), *Janajati* (-0.7 percent) and the *Brahmin/Chhetri* (-1 percent) respectively. Within the poor income groups, all the caste/ethnic groups have negative net benefits per household. *Newar* households have higher percentage of average per household negative net benefits (-6.2 percent) followed by *Janajati* (-4.8 percent), *Dalit* (-3.4 percent) and the *Brahmin/Chhetri* (-1.4 percent) respectively. This means that invariably difference in the percentage of average per household negative net benefits by income group is positively related according to income status from all the caste/ethnic groups while significant variation of the percentage of net benefits sharing by caste/ethnic groups is not positively related according to caste/ethnicity status from all the income groups of households. Because *Brahmin/Chhetri* households from rich income groups have lower percentage of average per household net benefits and the

Dalit households from the middle-income groups have higher percentage of average per household net benefits than rest of other caste/ethnic groups. Thus, household level percentage sharing of average per household net benefits between income groups seems relevant positively related to income status but it seems irrelevant positively related to caste/ethnicity status. Table 8.11b clearly indicates that the difference in percentage sharing of average per household net benefits by all the caste/ethnic groups is not always so different according to caste/ethnicity status but the poor income class from all the caste/ethnic groups invariably differs from the other two income groups in this respect. Moreover, it is apparently severe negative net benefits for the different poor income groups from the all caste/ethnic groups. However, it appears that the variation of household level sharing of average per household net benefits within income and caste/ethnic groups is significant from the all the income groups and caste/ethnic groups as well. This indicates that the household level net benefits obtained from CF among the income groups are positively related with the degree of household wealth endowment (agricultural land and livestock ownership) rather than caste/ethnic groups.

The benefits from CF and cost of CF management are said to be internalized if each of the caste group of households is made to bear them in full. The summary statistics of Tables 8.11.a and 8.11.b demonstrates the variation of household level benefits accrued in relation with total gross cost incurred by different caste/ethnic groups within and between the caste/ethnic groups seems uneven and inconsistent. For example, out of four caste/ethnic, *Newar* and *Janajati* have higher percentage of average per household net benefits (1.9 percent) and (0.5 percent) while percentage of average per household net benefits is negative for *Brahmin/Chhetri* and the *Dalit* (-1.5 percent) and (-0.9 percent). Comparative data of the household level gross benefits accrued minus gross cost per household incurred and percentage of average per household net benefits obtained by different caste/ethnic groups indicates that *Brahmin/Chhetri* and the *Dalit* have completely failed to internalize the benefit from CF as per the total gross cost per household incurred equivalent by negative net benefits of (-1.5 percent) and (-0.9 percent). *Newar* and the *Janajati* are being able to internalize the benefit from CF by externalized the total gross cost on *Brahmin/Chhetri* and the *Dalit* households equivalent by positive net benefits of (1.9 percent) and (0.5 percent). Due to non-exclusive characteristics of common property resource management, since even a benefit losers *Brahmin/Chhetri* and the *Dalit* households must have taken part in overall total gross cost of forest use, operation and management. Thus, *Newar* and *Janajati* households are getting higher percentage of net benefits and paying less percentage of gross cost per household without providing any compensation to *Brahmin/Chhetri* and the *Dalit* households.

Thus, the net externality effect of CF in terms of benefits accrued (positive externality) minus total gross cost incurred (negative externality) i.e. net benefit is negatively related to the so called high caste *Brahmin/Chhetri* and positively related to the richer households. Thus, Table 8.11a and 8.11b indicate that however, significant variation of household level net benefit among the caste/ethnic groups, equity outcome of CF management seems likely to be inefficient. Because out of four caste/ethnic groups, *Brahmin/Chhetri* and the *Dalit* households are being unable to internalize both the positive and negative externality of CF use and management in terms of household level benefits minus gross costs i.e. net benefit. On the other hand, *Newar* and *Janajati* households are enjoying more benefits than burdening the costs from the management of common property resources and hence they are being able to internalize both the positive and negative externality of CF use and management in terms of household level net benefits. If equity outcome of CF management would be in place nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued minus gross cost incurred i.e. net benefit from CF use and management by the different caste/ethnic groups, the externalities of CF use and management has not created equity efficiencies within and between the caste/ethnic groups in the study area.

Similarly, the benefits from and gross costs of CF use management are said to be internalized if each of the income group of households is made to bear them in full. The summary statistics of two Tables - 8.11a and 8.11b demonstrate the household level variation of benefits accrued in relation with gross costs incurred by different income groups of households within and between the income groups seems uneven. For example, three income groups of households – rich, middle and poor income households are getting average per household percentage of net benefits (4.0 percent), (0.0 percent) and (-4.0 percent) respectively.

Comparative data of the household level gross benefits accrued minus gross cost per household incurred and percentage of average per household net benefits obtained by different income groups of households indicates that the poor income households are completely failed to internalize the benefit from CF as per the total gross cost per household incurred equivalent by negative net benefits of (-4.0 percent). The middle income households are being able to internalize by equalize both of gross benefit (37.0 percent and the total gross cost (37.0 percent) from CF. The rich income households are being able to externalize the total gross cost on the poor income households to gain disproportionate net benefits (4.0) from CF. Due to non- exclusive characteristics of common property resource management, since even a benefit loser, the poor income

households should take part in overall total gross cost of forest use, operation and management. Thus, the rich income households are getting higher percentage of net benefits and paying less percentage of gross cost per household without providing any compensation to the poor income households. The middle income households appeared in a position of no more gain nor more loss or zero net benefit.

Thus, the net externality effect of CF in terms of benefits accrued (positive externality) minus total gross cost incurred (negative externality) i.e. net benefit is negatively related to the poor income households and positively related to richer households. Thus, Table 8.11a and 8.11b indicate that, however, significant variation of household level net benefit among the income groups, equity outcome of CF management seems likely to be inefficient. Because out of three income groups, only the middle income households are being able to internalize both the positive and negative externality of CF use and management in terms of household level benefits minus gross costs i.e. net benefit. On the other hand, the rich income households are enjoying more benefits from CF than burdening the costs of management of CF as common property resources and hence they are being able not only to internalize both the positive and negative externality of CF use and management in terms of household level net benefits but they are also able to externalize the total gross cost on the poor income households to gain disproportionate net benefits from CF. If equity outcome of CF management could be in place, nobody could externalize costs (negative externality) to others to gain disproportionate benefits (positive externality) from CF as common property resources. Thus, it is concluded that in case of benefits accrued minus gross cost incurred i.e. net benefit from CF use and management by the different income groups of households, the externalities of CF use and management has not created equity efficiencies between the rich and poor income groups of households in the study area.

8.3.2 Percentage Distribution of Net benefits by Caste/Ethnic and Income Groups

Table 8.12 summarizes the distribution of household level net benefits for three income groups of the sixteen CFUGs based on preceding discussions in section 7.3 of chapter seven and calculations made from the Annex Tables 8-M and 8-O. the details of net benefit distribution to four caste/ethnic groups of surveyed households of sixteen CFUGs are presented in Annex Table 8-Q.

Table 8.12

Distribution of Net benefits among Caste/Ethnic Groups (in Percentage)

(in Nepalese Rupees)

Caste/Ethnic Groups (a)	Gross Benefits(b)	Gross Costs(c)	Net Benefits(d) = b-c	B/C Ratio (e) = b/c
Dalit	22.5	23.4	-0.9	0.96
Janajati	23.6	23.1	0.5	1.02
Newar	28.2	26.3	1.9	1.07
Brahmin/Chhetri	25.7	27.2	-1.5	0.94

Source: Computed from Annex Tables 8-Q.

The same data sets of Table 8.12 are presented graphically in Figures 6 and 7.

Figure 6

Percentage Distribution of Gross benefits and Gross Costs by Caste/Ethnic Groups

(in Nepalese Rupees)

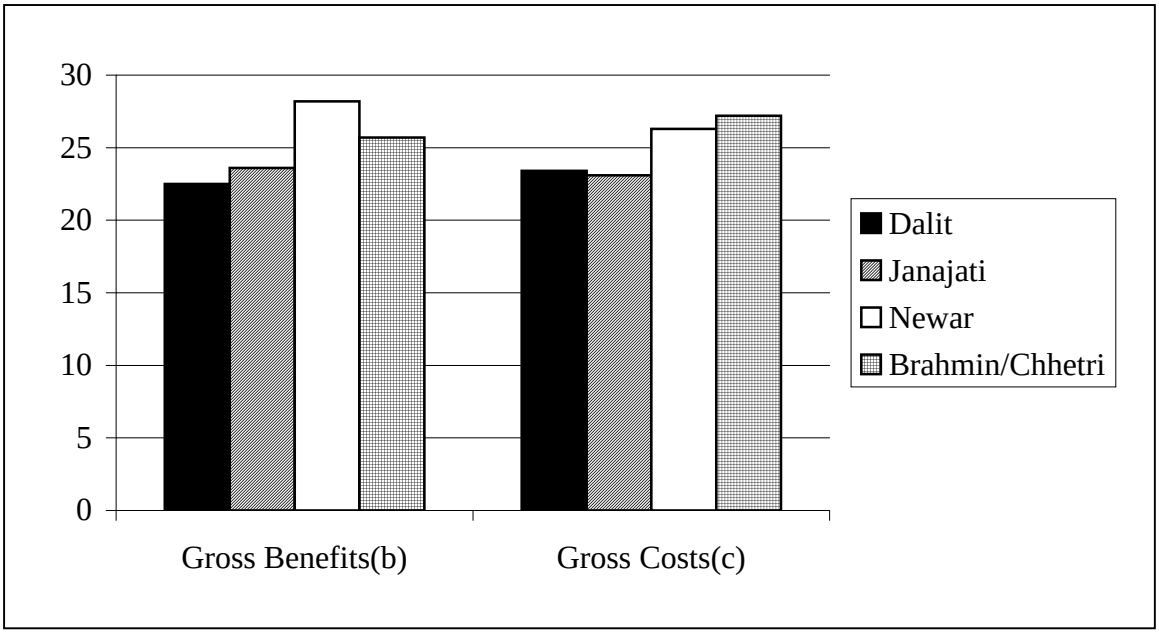


Figure 7

Percentage Shares of Net benefits and Benefit/Cost Ratio by Caste/Ethnic Groups (in Nepalese Rupees)

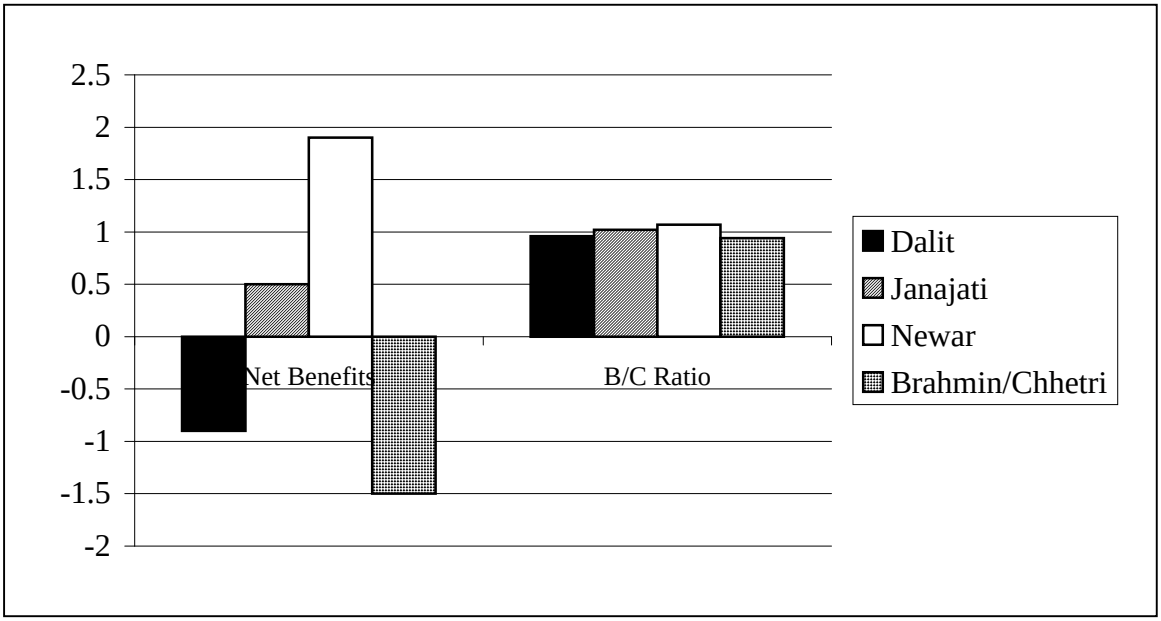


Table 8.12 and Figures 6 and 7 show that *Brahmin/Chhetri* and the *Dalit* households from most CFUGs have getting relatively less gross value from and sharing more gross cost to CF and hence have negative benefit to them contrary to *Newar* and the *Janajati* households. Table 8.12 depicts the fact that the total gross cost shared by the *Brahmin/Chhetri* and *Dalit* households exceed (27.2 percent and 23.4 percent per household) the benefits received (25.7 percent and 22.5 percent per household) and hence they have negative net benefit (-1.5 and -0.9) with less than one B/C ratio (0.94 and 0.96). On the other hand, the gross value obtained by *Newar* and the *Janajati* households exceed (28.2 percent and 23.6 percent per household) the gross cost incurred (26.3 percent and 23.1 percent per household) and hence they have positive net benefits (1.9 and 0.5) with more than one B/C ratio (1.07 and 1.02). The reasons behind to be negative net benefit and the less than one B/C ratio for the *Dalit* households are: a) high share of membership fees b) lower opportunity costs of labor c) failure to internalize the benefit from CF d) use low value products from CF and moreover, e) dominance of non-exclusive characteristics of benefit – cost sharing of a common property forest resource management regime.

The reasons behind to be negative net benefit and the less than one B/C ratio for the *Brahmin/Chhetri* households are: a) high share of labour cost to total gross cost, b) hired labor to harvest forest products, c) failure to internalize the benefit from CF and

moreover and d) dominance of non-exclusive characteristics of benefit–cost sharing of a common property forest resource management regime. Similarly, the reasons behind to be positive net benefit and the more than one B/C ratio for the *Newar* and the *Janajati* households are: a) harvesting and use more and almost all types of forest products, b) harvesting and use of high value forest products such as timber green fodder and grass from CF, c) domination in forest management and utilization activities and d) high purchasing power for bidding the forest products if set out for auction sale.

Table 8.13 summarizes the distribution of household level net benefits for three income groups of the sixteen CFUGs based on preceding discussions in section 7.3 of chapter 7 and calculations made in the Annex Tables 8-N and 8-P. The details of net benefit distribution to three income groups of surveyed households of sixteen CFUGs are presented in Annex Table 8-R.

Table 8.13

Distribution of Net benefits among Income Groups (in Percentage)

(in Nepalese Rupees)

Income Groups(a)	Gross Benefits(b)	Gross Costs(c)	Net Benefits(d) = b-c	B/C Ratio (e) = b/c
Rich	45.0	41.0	4.0	1.09
Medium	37.0	37.0	0.0	1.0
Poor	18.0	22.0	-4.0	0.81

Source: Computed from Annex Tables 8-R.

The same data sets of Table 8.13 are presented graphically in Figures 8 and 9.

Figure 8

Percentage Distribution of Gross benefits and Gross Costs by Income Groups (in NRs)

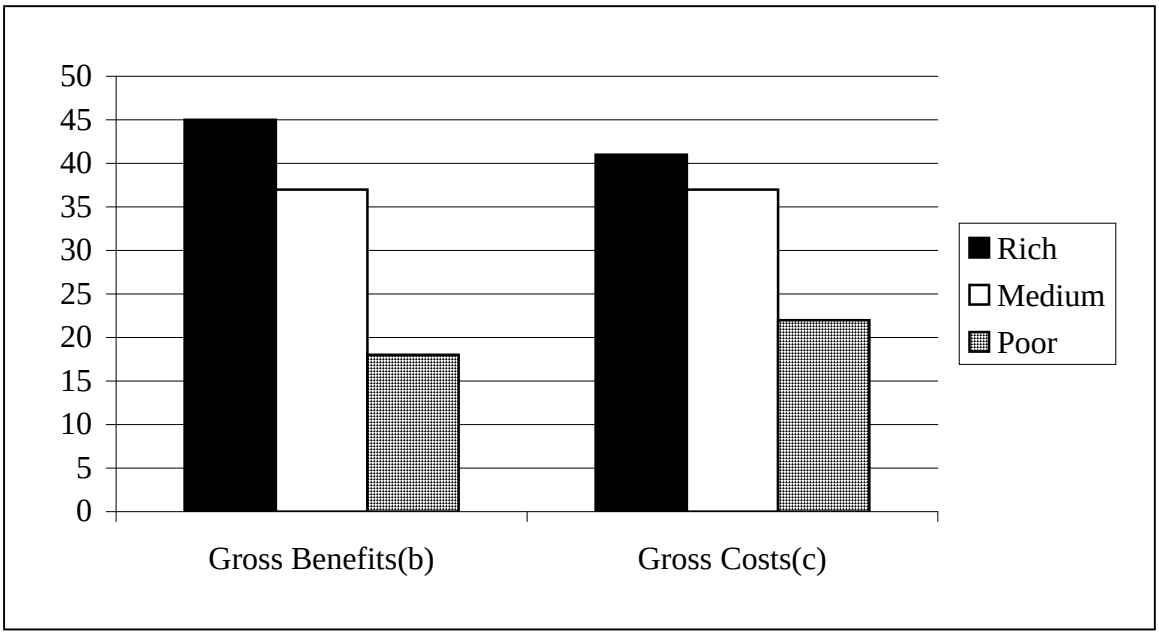


Figure 9

Percentage Shares of Net Benefit and Benefit/Cost Ratio by Income Groups

(in Nepalese Rupees)

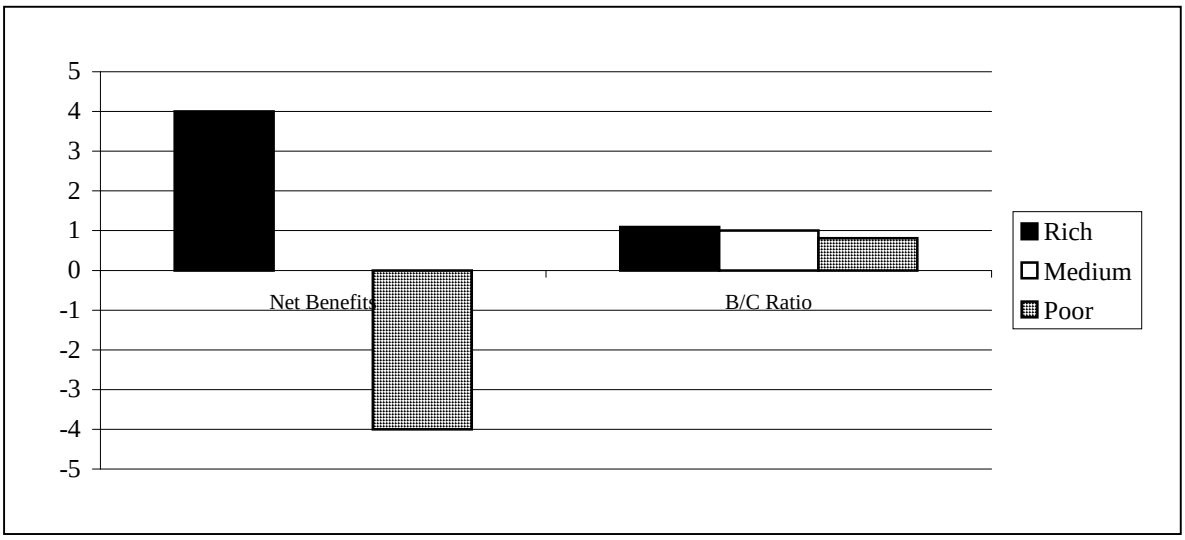


Table 8.13 and Figures 8 and 9 show that poor households from most CFUGs have getting relatively less gross value from and sharing more gross cost to CF and hence have negative benefit to them contrary to the non-poor households. Table 8.13 depicts the fact that even the lowest absolute cost incurred by the poor group than non-poor groups, the total cost shared by the poor households exceed (22.0 percent per household) the benefit received (18.0 percent per household) and hence the poor income households have negative net benefit (-3) with less than one B/C ratio (0.81). The reasons behind to be negative net benefit and the negative B/C ratio for poorer households are: a) high share of transaction costs, b) lower opportunity costs of labour, c) failure to internalize the benefit from CF, d) use low value products from CF and moreover and e) dominance of non-exclusive characteristics of benefit–cost sharing of a common property forest resource management regime.

Table 8.13 shows that rich households have highest gross cost and benefits from CF followed by middle-income households. The reasons of high gross cost and benefits of rich income group are: a) harvesting and use more and almost all types of forest products, b) harvesting and use of high value forest products such as timber green fodder and grass from CF, c) domination in forest management and utilization activities ans d) high purchasing power for bidding the products if set out for auction sale.

Households from middle-income groups have equal gross cost and benefits from CF and hence they obtained zero net benefits and zero benefit cost ratio apparently to be no net loss and no net gain situation from forestry activities. The likely causes for this are: a) high opportunity cost of labour, b) harvesting highest number of low value bedding materials for agriculture and livestock and c) harvesting small quantity of high value forest products such as timber. It can be said that this group is able to internalize the externalities by equalize the benefit from and cost of CF. Zero net benefit and zero b/c ratio of middle-income group are the evidence of this fact. However, the middle-income group has higher gross benefit and cost compared to poor income group even to be zero net benefit and zero b/c ratio.

CHAPTER 9

9 CONCLUSION

9.1 Summary

Nearly 85 percent of the total population has been residing in rural areas since mid 90s. Nepal still remains one of the least developed and the poorest countries in the world with nearly half of its population living below the poverty line. However, Nepal has already completed nine periodic plans and the Tenth Plan is in its final stage. The summary results of poverty analysis by the Central Bureau of Statistics (CBS) of Nepal, using Nepal Living Standard Survey data and poverty line 2003/04, shows that rural poverty has been decreased by 8 percentage point (from 43 percent to 35 percent) and the urban poverty has declined by 12 percentage point (from 22 percent to 10 percent) during the eight years of interval (1995/96-2003/04). Overall incidence of poverty in Nepal is to be about 31 percent. It has indicated the existence of the acute poverty in rural areas in comparison to the national average and urban areas of Nepal. Value of human development has increased by 0. 471 in 2004 (HDR, 2004) since it was 0.378 in 1998 (HDR, 1998) and 0.466 in 2001 (HDR, 2001). This means that the performance of human poverty seems to move towards the positive trend. However, Gini Coefficient for inequality increased from 0.34 to 0.41 during the period 1996/96-2003/04.

Forest resources are the second largest resource after water resources in Nepal. About 50 percent of the total area is under some sort of natural vegetation cover such as trees, shrubs or grasses. However, forest areas are under great pressure for meeting firewood, fodder, timber, medicines and infrastructure development. The problem was further compounded due to change of forests from private to public ownership as per the Private Forests Nationalization Act, 1957. Nepal comprised of 6.4 million hectares of forests in 1964, which constitute declined to 5.8 million hectares including shrub land by the mid-1990s. During these three decades 0.6 million ha of forestland has been destroyed. However, until now total area of the country's forests is remaining only 4.27 million hectares (29 per cent) of which about 61 percent is categorized as potential community forest to be handed over to the local communities for management. It is estimated that there is a potential of 18, 76,300 hectares forested and 15, 85,800 hectares not forested land which can be developed as community forests. Similarly, 23, 13,100 hectares of Nepal's current national forests can also be considered potential community forests.

Thus, in the context of decreasing forest areas and increasing intensity and severity of rural poverty in Nepal, natural resource management at local level by the communities has become an integral part of sustainable development policy in the last few years. Recognizing the importance of organized civil society, the governments of many developing countries have begun to support community–based resource management. In Nepal and other developing countries, such attempt has focused on poverty reduction, local level socio-economic development and forest conservation and management. Two decades and half have been passed of the formal introduction of community forest management in Nepal focusing initially on participatory environmental conservation through the planting of trees in the hill area and latter on the emphasis turned to the institutional development of CFUGs with a distinctive models of community based participatory natural resource management approaches so that they could undertake forest management activities themselves and have better control of local resources. Nepal's Community Forestry Program is considered a leading example of community forest management in South Asia. Currently, some 13,397 Forest User Groups (FUGs) with 1,509,023 households are engaged in the management of approximately 1,094,107 hectares of forest areas in Nepal.

Although, environmental value by vegetation cover (bio-physical condition) of forest resources are found remarkably enhanced since the forest resource management regime shifted from state to local community participatory management, however, due to lack of relationship about different linkages between rural poverty and environmental/natural resources, equitable distribution of forests resources as a CPRs within the rural community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated. Thus, this study has examined this broad concern by investing whether recent policy shifts towards community-based forest resource management in Nepal have increased access of poorer households to community forest resources.

Despite having of some studies including cost-benefit analyses of CF management, little attention has been paid to the differential nature of CPRs dependence and returns to different caste/ethnic and income groups within heterogeneous resource-using communities. Therefore, this study has aimed to bridge this gap analyzing the dependency syndromes and externality effects of CPRs focusing the distributional implications of community forest management on different socio-economic groups of households at local level in understanding about how and to what extent of benefit and cost sharing they are dependent on community forests in Nepal. Keeping in mind these broad concerns prevalent in rural forestry sector, the present study has been undertaken in order to achieve the objectives as mentioned in chapter one.

Thus, at a more general level, this study has reviewed some theories of development, poverty environmental/natural resource nexus and verified the victim hypothesis into Nepal's community forestry by investigating to what extent community forestry has been contributed to the household level welfare for poor people. More specifically, this study focuses to understand the relationship of household socio-economic characteristics and incomes from and costs of community forests management. The equity issues of community forest management on different caste groups and income classes of households are the primary concern of this study. This has been examined with the help of cost-benefit analysis presenting the empirical evidences of differential distributional impacts and externalities effects of community forest management on different caste and income groups of households at the local level. Towards this end, this research study compares income from community forests and different types of cost that accrued and incurred to higher and lower caste and poor and non-poor groups of households. On the other hand, this study compares gross incomes accrued from CF and gross costs incurred of CF management to the four caste groups i.e. Brahmin/Chhetri, Newar, Janajati and Dalit households and three income groups i.e. rich, medium and poor households.

The study was under taken in sixteen Community Forest User Groups (CFUGs) including fourteen CFUGs from three VDCs- Jarayotar, Yaku and Chharamwi of Bhojpur district and two CFUGs from one VDC- Leguwa of Dhankuta district in the lower Arun river valley.

Two major types of forest products–consumption based and production based forest products were observed in the study area. Fuel-wood and timber are consumption based forest products that the households directly use to fulfill the subsistence needs. Other biomass products such as green fodder, green cut grass and green/dry leaf litter are production based forest products that households use them indirectly as input to complement other productive assets such as paddy fields or livestock. This means that the level of harvesting of production-based biomass forest products is an increasing function of agricultural land holding size and the number of livestock ownership. Most users' rights of forest products are non-transferable. Cash income earned by community forest is the common income and not distributed among the users. Moreover, users are not allowed to sell their private share of the products in the market. Thus, there is a strong argument to be made that CF in Nepal is incentive-incompatible. Traditionally, poorer households were dependent more on local forests for firewood and other NTFPs. Conversely, with the introduction of usufruct property right regimes in forestry, the access of poorer households to forests has been reduced due to a restrictive management regime that yields negative benefits to poorer income groups in comparison to non-poor income groups. On the other hand, such restrictive management regime of community

forest discourages NTFP collection, charcoal making and other activities in which occupational households (i.e., blacksmith, local liquor makers, etc.) were traditionally involved.

Thus, the existing institutional base and distributional rules of community forestry in Nepal is said to be unable to distribute the common property forest resources and provide a significant contribution to the livelihood of poor and marginalized people. The main reason of community forestry not to be poverty responsive may be the basic policy objective remains only the fulfillment of subsistence needs and its failure to take into account well being benefit approach for sustainable use and equity of forest resource distribution within the rural poor communities.

The study findings seem to suggest that because of the dependence in absolute terms on intermediate products, the so called high caste and rich households with assets endowment gain more from CF than the lowest caste and poorest households in the Eastern mid-hill rural villages of Nepal. On the contrary, in relative terms, the so called higher caste and richer income class of households gain the least from CF and the lowest caste and the poorest households gain the most from CF due to the low non-CF cash income for the poorer income households than higher caste and the non-poor income households. The results also suggest a negative relationship between net CPR income and caste group i.e. the high caste *Brahmin/Chhetri* households have the lowest net income from CF as a percentage of total income than the lower caste even than the lowest caste *Dalit* and a possible positive relationship between net CPR income and wealth-ranked group i.e. the poor income households have the lowest net income from CF as a percentage of total income than the rich and middle-income households due to the high share of transaction costs of community forest management for the poorer income group than the non-poor income groups. Thus, CF contributes more to rich and middle-income households in comparison to the poor households. Hence, the current practices of community forest management have negative impact on rural poor that lacks the provisions for addressing equitable system of benefit distribution and cost sharing among the forest user groups and user households. What has been shown here is only more indicative than conclusive although, the trend has to be analyzed using the time series data for the future research perspective.

Thus, this study raises the concern of whether conservation-oriented measures that promote regulated systems of forest management in Nepal under-mine social goals such as equitable distribution of benefits, however, in relative terms, the so called lowest caste and the poorest households are more dependent on community forests. It is reasonable to require that policies aimed at allocating natural resources should not eschew equity

considerations altogether (Tsur & Dinar, 1995). Some scholars such as (Majone, 1993) argue that policy changes in CF management should not be precipitated by ideas about conservation and efficiency, rather, they need to be fully cognizant of redistributive concerns. CF interventions, to some extent, are unable to recognize that resources often have multiple users, who are characterized by different use patterns and conflicting interests. Thus, there is a risk that CF will focus on long-term accumulation of timber and ecological service values in order to meet the need of external donors, central government and the local elites, whereas this might reduce opportunities available for the poor. Since this study could not compare pre and post impact of CFs on household income, further comparative study on this issue may help understand the complexity involved in poverty, inequality and distributive consequences of regulated forms of CPR regime.

9.2 Findings of the Study

1) Results of socio-demographic status of sampled household and population:

According to the operational plan of each 16 CFUGs, the total household numbers of the study area comprised of 1,227 in 2003. Out of this, 399 numbers of households with average of 32 percent were surveyed. Among the surveyed households the total number of population in the whole study area was found to be 2,416 including the male population 1,211 (50.1 percent) and female population 1205 (49.9 percent) with average household size 6.05 (Table 5.1). Out of the total sampled households and population (399 and 2416), *Brahmin/Chhetri* households had higher percentage of population (39.8 percent) with male (50.2 percent) and female (49.8 percent) followed by Janajati households (37.5 percent) with male (51.3 percent) and female (48.7 percent), Newar households (11.7 percent) with male (47.7 percent) and female (52.3 percent), and Dalit households (11.0 percent) with male (48.7 percent) and female (51.3 percent) respectively (Table 5.2). Similarly, *Dalit* and *Newar* households had higher percentage of below five years of age populations (12.8 percent and 12.4 percent) than *Brahmin/Chhetri* and *Janajati* households (10.2 percent and 9.3 percent). Similarly, population between 6-10 years age was higher for low caste *Dalit* (19.6 percent) and it was lower for high caste *Brahmin/Chhetri* households (10.5 percent). Population between 11-14 years age was also higher for low caste *Dalit* (14.7 percent) and it was lower for Newar households (10.6 percent). The population between 15-59 years age was higher for *Brahmin/Chhetri* and *Janajati* households (59.2 percent) and it was low for lower caste *Dalit* households (46.0 percent). The population above 60 years age was higher for *Brahmin/Chhetri* and *Janajati* households (8.2 percent) and it was lower for low caste *Dalit* households (6.8 percent) (Table 5.3).

The total number of population of middle-income group of households was found to be 903 (37.4 percent) with male (50.8 percent) and female (49.2 percent) followed by the rich income group 757 (31.3 percent) with male (47.6 percent) and female (52.4 percent) and the poor income group 756 (31.3 percent) with male (51.8 percent) and female (48.1 percent) respectively (Table 5.4). The poor households had more male than female population with low sex ratio (0.92) and the rich households had more female than male population with high sex ratio (1.1). The middle income households also had slightly more male than female population with low sex ratio (0.96) (Table 5.4). Among the three income groups, the proportion of young people below 15 years of age in total population was relatively high (55.8 percent) for the poor income group followed by the middle income (33.8 percent) and rich income groups (28.2 percent) respectively (Table 5.5). The proportion of independent population of the rich income group was relatively high (60.9 percent) than the proportion of dependent population (39.1 percent) of its total population followed by the middle income (59.0 percent) and (41.0 percent) and the poor income group (52.5 percent) and (47.5 percent) of their total population respectively (Table 5.6).

Out of the total population 2,416, the total number of illiterate people (6 years age and above) are comparatively high as 590 (24.4 percent of total population) than literate people (6 years age and above) 506 (20.9 percent) in the whole study area. Regarding the educational status prevailing in the study area, the finding of the study show that the number of primary level of education received people are 471 (19.5 percent) followed by the secondary level of education received people 500 (20.7 percent), higher secondary level of education received people 67 (2.8 percent), graduate level of education received people 25 (1.0 percent) and post graduate level of education received people 6 (0.2 percent) respectively (Table 5.7).

Within the caste group, *Dalit* group had more illiterate people (34.70 percent) than literate people (17.0 percent). As the level of formal educational attainment is concerned, the primary level of education-received people was higher (27.9 percent) than the secondary level of education received people (7.5 percent). On the other hand, they did not have any higher secondary, graduate and postgraduate level of education received people as well. There was a sharp caste/ethnic gap in further successive level of educational attainment for marginalized groups in comparison to dominant caste/ethnic groups in the society. Within the *Brahmin/Chhetri* community, the illiterate people were less (20.1 percent) than literate people (22.0 percent). Similarly, the secondary levels of education-received people were more (25.7 percent) than the primary level of education-received people (15.4 percent). This indicates that the number of higher secondary (43), graduate (17) and postgraduate level of education-received people (4) are decreasing at

each successive level of educational attainment. Within the *Janajati* and *Newar* groups, both had higher illiteracy (25.7 percent and 25.4 percent) than literacy (20.5 percent and 22.6 percent). Likewise, both had decreasing trends of the level of educational attainment from primary level to graduate level. There was no postgraduate educated member seen in the *Newar* families (Table 5.8). Access to education above the S.L.C. level for the poor and so called lower caste people seems not only difficult but also extremely inaccessible.

The rich income group had lower illiterate people (21.8 percent) than the literate people of six years age and above (25.8 percent). Contrary to this, the poor income group had higher illiterate people (35.7 percent) than the literate people (20.1 percent). The middle-income group had also more illiterate people (25.0 percent) than literate people (24.0 percent). The rich income group had higher number of the secondary level of educational attainment (196) than the number of primary level educational attainment (188). The middle-income group had also the same trend regarding the level of primary and the secondary educational attainment. It had more secondary education-received people (212) than the primary education-received people (170). On the contrary, the poor income group had more primary education-received people (193) than the secondary education-received people (92). Most FUGS had higher number of illiterate female than male. The gender gap in education widens further at each successive level of educational attainment (Table 5.8, 5.9 and 5.10).

2) Results of economic status of sampled household and population:

Agriculture is the mainstay of Nepalese rural economy. This sector absorbs around 67 percent of labour force and contributes around 38.0 percent to GDP in real term. However, the findings of the study show that there is wide disparity in the distribution of operated land*)* among the households in the study area. The worked out figures show that out of 509.3 hectares of total operated land in the study area, the poor farmers having only holdings of less than 0.5 hectare with the total 30.8 hectares (6.0 percent) of all types of operated land while the middle farmers having holdings of 0.5-2 hectares with total 222.6 hectares (43.7 percent) of all types of operated land. The rich farmers having holdings more than 2 hectares with total 255.9 hectares (50.3 percent) of all types of operated land. (Table 5.11 and 5.12)

Out of the total 509.28 hectares of land and the total 399 households in the study area, 39.6 percent of *Brahmin/Chhetri* households had the highest area (49.0 percent) of the total land. 39.1 percent of *Janajati* had 34.0 percent of the total land and 10.5 percent of *Newar* had 9.4 percent of the total land. While 10.8 percent of *Dalit* had lowest percent (7.7) of the total land (Table 5.13b). Likewise, out of total 43 *Dalit* households, only 6

households owned more than two hectares of land, 24 households owned 0.5-2 hectares of land and 13 households owned less than 0.5 hectare of land with an average of 0.9 hectare. Out of total 156 *Janajati* households, 26 households owned more than two hectares of land, 98 households owned 0.5-2 hectares of land and 32 households owned less than 0.5 hectare of land with an average of 1.1 hectares. Similarly, Out of total 42 *Newar* households, only 6 households owned more than two hectares of land, 29 households owned 0.5-2 hectares of land and 7 households owned less than 0.5 hectare of land with an average of 1.2 hectares. Out of total 158 *Brahmin/Chhetri* households, 56 households owned more than two hectares of land, 75 households owned 0.5-2 hectares of land and 27 households owned less than 0.5 hectare of land with an average of 1.6 hectares.

Similarly, out of 145 poor households (36.3 percent of total households), only one household owned more than two hectares of land. The number of 72 households of small farmers owned 0.5-2 hectares of land whereas 72 marginal farmer households owned less than 0.5 hectares of land with an average of 0.5 hectares for poor income households. Out of 143 middle-income households (35.8 percent of the total households), 13 households owned more than two hectares of land. The number of 124 households of small farmer owned 0.5-2 hectares of land whereas 6 households owned less than 0.5 hectare of land with an average of 1.2 hectares for the middle-income households. Similarly out of 111 richer households, majority households (80 households) owned more than two hectares of land. The number of 30 households of small farmer households owned 0.5-2 hectares of land and only one household owned less than 0.5 hectare of land with an average of 2.5 hectares (Table 5.14a and 5.14b).

The findings of the study show that there is wide disparity in livestock holdings among the households in the study area. The worked out figures show that out of total 5,075 numbers of livestock and 399 households in the study area, the *Brahmin/Chhetri* group had the highest average per household livestock holding (15.4) followed by *Newar* (11.7), *Janajati* (11.4) and the *Dalit* (8.6) respectively. The wealthier households had the highest average household livestock holding (19.1) followed by the middle income households (12.7) and the poor income households (7.9) with the total average of 12.7 respectively. Among the types of livestock, the average household holdings of goat was highest (6.6) followed by cow/ox (4.1), Buffalo (1.3) and pig (0.7). (See Table 5.15 and 5.16)

The findings of the study show that food deficit problem was pervasive among the households in the study area. The worked out figures show that out of total sample households, majority of the households (53.6 percent) were unable to fulfill their food

requirement by their own production. Only 26.6 percent households were able to fulfill just to meet their yearly food requirement by their own production while only 19.8 percent households were able to produce more than adequate surplus food grain. Large proportions of Dalit households were facing food deficit problems for whole year whereas *Brahmin/Chhetri* households were less food deprived. *Newar* and *Janajati* households had food deficit month of less than 3 month and there was no any *Newar* and *Brahmin/Chhetri* household suffering from food deficit problem for whole year. Among the wealth-ranked groups, more rich households (46.8 percent) had food surplus situation for one year by their own production in comparison with medium households (16.1 percent) and poor households (2.8 percent) with total average of 19.8 percent of food surplus households out of total households in the study area. Among wealth-ranked groups, only the poor income households had food deprivation for whole year. (Table 5.17, 5.18, 5.19 and 5.20).

Regarding the occupational activities and sources of income, the study concludes that agriculture and livestock were the dominant occupational activities among the households in the study area. The worked out figures show that the *Brahmin/Chhetri* households were receiving relatively higher income from the agriculture and livestock occupational activities followed by government services and remittance/ wage. On the contrary, the most important occupational activities of the *Janajati* households were non-farm activities that contributed more than 50.0 percent of the total household income. The *Newar* households had relatively high importance of agriculture farming and livestock rearing occupational activities. Remittance/wage income from occupational activities had significant contribution to household income for *Dalit* households (Table 5.21).

Likewise, the rich income households were receiving relatively higher income from the occupational activities of agriculture and livestock followed by government services and remittance/ wage. Contrary to this, the most important occupational activities of the middle-income households were non-farm activities. Similarly, the poor-income households had low interest in agricultural occupation due to the low farm size. They had relatively higher level of income from the occupation of government services and remittance/wage. The relatively high-income share from government services and remittance/wage of the middle income and the poor-income households reflects an increasing trend of local youth recruitment in police and security force and emigration for foreign employment (Table 5.22).

3) Results of rural poverty scenario across the sampled household and population

Findings of the rural poverty scenario based on multidimensional local criteria show that across the socio-demographic and economic indicators poverty is common among the households in the study area. The worked out figure of poverty across the socio-demographic and economic indicators reveals the fact that poverty is not the plight of the so called lower caste and poor income groups only and prosperity is not the fate of high caste and rich income groups only. It affects all the caste/ethnic groups and income groups of households as well. Because each of the caste/ethnic group had rich, medium and poor households and population and each of the income group had *Dalit*, *Janajati*, *Newar* and *Brahmin/Chhetri* households and population with poverty syndromes and prosperity symptoms. Although, the profile of existing performance of major socio-demographic and economic indicators with varying extents and magnitudes for different caste and income groups of households seems to be ranking the poor and low caste households at the bottom level than those of non-poor and the so called upper caste households in the study area. However, the state of poverty in rich and middle-income households as well as the so called higher caste groups of households seems transient; with small efforts, these households could escape poverty. While, poverty remains chronic in poor income group of households as well as the so called low caste group of households; due to their small farm size, lack of irrigated land, small livestock holdings, very low level of household income etc. they may be unable to escape poverty. (Table 5.23)

4) Results on institutional mechanisms, property rights arrangement and distributional rules of community forestry:

Among the sixteen CFUGs selected for the study, two community forest user groups (CFUGs) were smaller and remaining CFUGs were bigger than the national average of 73 hectares. Most CFUGs covered two common forest types in study area: forests dominated by *Pinus roxburghi*.and mixed forests of *Schima-castanopsis* along with *Alnus*. Altogether, four major caste groups and three income groups of households in the study area have used nine items of forest products from community forests (Table 7.1). However, it was observed that two major types of forest products – consumption based and production based forest products were using by the local villagers in each CFUG. The level of harvesting of production-based biomass forest products was found to be an increasing function of agricultural land holding size and the number of livestock ownership.

The findings of the study regarding institutional mechanisms, property rights arrangement and distributional rules based on field observations show that these were

common to most CFUGs. Presently, all the CFUGs were governing the functioning of community forest as per the Forest Act (1993) and the Forest Regulations (1995) in the study area. However, all the CFUGs had their own institutional mechanism and the operational rules regarding the extraction and provision rules, detection and graduated sanctions, collective-choice arrangements, conflict-resolution mechanisms and monitoring systems. Forest user's assembly was the highest authority, which made decisions regarding the rules of community forest management and governance. The constitution of the CFUG was prepared by the general assembly. The five-year operational plans define user rights, and determine the rules for forest product collection and distribution should be sanctioned by the general assembly. All the CFUGs had formed a working committee-Forest User's Executive Committee (FUEC) comprised of 7 to 11 members including two women. The executive committee of the CFUG implements decisions as per the direction of assembly. Generally, 12 meetings Forest User's Executive Committee and 1 to 2 numbers of assemblies were held in a year. All the key post/designation holders including the members were elected by mutual consent.

The findings of the study show that the number of members from a particular caste/ethnic group in the forest user group still played a major role in the formation of CFUG leadership in the study area. The worked out figure show that out of the total of 157 members in sixteen FUECs including all the designations, 70 numbers (44.6 percent) were filled by *Bramhin/Chhetri* followed by *Janajati* 57 number (36.3 percent), *Newar* 17 number (10.8 percent) and Dalit 13 number (8.3 percent) respectively. In most caste/ethnic groups the level of female representation in FUEC was very low in comparison to the male representation. Less than 20.0 percent of female members (against the provision of one third of the forest user's executive committee) were representing in the local forest user's executive committee. Out of the total 16 designations of chairman, 8 or (50.0 percent) were held by only the male *Bramhin/Chhetri*, followed by only the male *Janajati* (48.3 percent) and only the male *Newar* (6.3 percent) respectively. The representation of both male and female *Dalit* in all the key designation was completely nil whose total numbers of user were 265. Likewise, most females from rest of all other caste/ethnic groups in the key posts of forest user's executive committee were almost nil whose total numbers of user were 1,205. Only one female vice-chairman and Joint-Secretary from the *Janajati* were represented in the name of the female in the key posts in the entire forest user's executive committee in the study area. The trends of other key post holding was as the position of chairman occupied by only the male *Bramhin/Chhetri*, only the male *Janajati* and only the male *Newar* respectively. The trend of general membership post holding was also the same as

the key post holding i.e. higher number of the male member representation of *Bramhin/Chhetri* followed by *Janajati*, *Newar* and the *Dalit* respectively.

Property rights structure over forest resources had frequently changed in Nepal. The Forest Nationalization Act of 1957 brought huge tracts of forests previously managed as private and common property under the state control. Consequently, this act increased the rate of deforestation as villagers hurried to convert affected lands into agricultural use to exempt them from the transfer. By the mid 1970s, it was clear that the local people had to be involved in every aspects of forest management. As a result, the new and far-sighted Community Forestry Legislation and Decentralization Act (Forestry Master Plan) were passed in 1982 which spelled out a comprehensive policy statement for CF management and emphasized that control of forest should be turned over to Community Forest User Groups (CFUGs). As a result, Forest Act of 1993 and Forest Rules of 1995 came in place with an increasing emphasis on community-based resource management under the communal collective property regimes.

Regarding the provision rules on forest products harvesting and distribution among the households, the findings of the study show that all CFUGs had written norms about forest products harvesting and distribution including penalties, fines and graduated sanctions for those who violated the rules and regulations of CF. Not any CFUG had employs the forest watcher (*Ban Pale*). There were strict rules in harvesting green fuel-wood and other green forest products from CF. The worked out figures of distributional rules for access to *Sal* and non-*Sal* forest products show that such timber (*Kath*) was an important forest product supplied to construct houses and animal shed according to the need and demand of users. Nominal amount of fee was required that the users had to pay to get such *Sa*l and non-*Sal* timber (*Kath*) from community forest (Table 6.4 and 6.5).

The worked out figures of distributional rules for access to firewood products show that user households were not allowed collecting firewood throughout the year. In most of the study sites, *Kancho Daura* (green cut wood) was distributed once a year from March to April. In addition, unwanted inferior species of trees and shrubs such as *Bhogate* (*Maesa microphylla*), *Dhursul* (*Colebrokia oppositifolia*) were cut, chopped into burnable sizes and distributed to local users. In most FUGs, dead branches & fallen twigs (*Sukay Daura*) and plant residue (*Jhikra*) were collected free of cost throughout the year and its use was not restricted. Green tree branches were collected free of cost once a year from February to March. Green firewood harvesting from green tree cut was a collective activity and households were required to pay Rs5/- to Rs 25 per green tree cut as a fee to the CFUG (Table 6.6). Ground grass is allowed free of cost from July to November in a year while tree grass fodder is allowed free of cost throughout the year (Table 6.7).

Households that did not use grass and tree fodder were not allowed to harvest for commercial purposes.

The worked out figures of distributional rules for access to green and dry leaf litter forest products show that most of the households used bedding materials for animal such as combination of dry leaf litter, non-palatable green vegetative material, crop residues and remains of uneaten fodder in the study area. Green leaf litter (*Syaula*) such as *Bhogate* (*Maesa microphylla*), *Dhursul* (*Colebrokia oppositifolia*), *Simali* (*Vitex negundo*) and *Angeri*) were collected free of cost mainly on summer from June to September. An alternate to chemical fertilizers most households had a common practice to collect dry leaf litter (*Patkar*) from CF for animal bedding and mulching to maintain soil fertility. Dry leaf litter were collected free of cost at any time. Many user groups allowed collecting and gathering dry *Patkar* free of cost without restriction. The time to collect dry *Khar* and *Babio* from community forest was mainly in November and December (Table 6.8).

The worked out figures of distributional rules for access to forest's fruit products show that energy-rich forest fruits in local forests such as *Bayar, Bel, Bhalayo, Jamun/Fadir, Kattus, Sarifa, Satibayar and Trifala* (*Harro, Barro and Amala*) were collected from CF mainly on October to December, May to June, June to August, July to August, May to August, September to November and December to January respectively. The *Trifala* fruit including *Harro, Barro* and *Amala* from CF was allowed to collect free of cost throughout the year (Table 6.9). In most FUGs, users were prohibited from cutting fruit trees and certain other special species. There is no provision of transferable property rights for any forest product. Livestock grazing was observed free in most of the community forests.

5) Results of income and expenditure pattern of community forests:

Regarding the income of CFUGs, the workout figures show that cash income earned by community forest was the common income and not distributed among the users. Income from the membership fees, sale of timber, NTFPs and other products was directly deposited in community funds. Most CFUGs used these funds for lending to earn interest, and very few CFUGs used these funds for community development works. Most forest users' groups were obtaining the smaller portions of the income (32.0 percent of total income) from the forestry sources such as sale of different forest products. While they were obtaining the greater portions of the income (68.0 percent of total income) from the non-forestry sources (Table 6.10). Likewise, regarding the investment/expenditure pattern, the worked out figures show that most CFUGs were investing average 41.3 percent of their fund on lending area with 24.0 percent interest

rate. There was little expenditure on forest protection and management. Huge amount of fund was found to be diverted to reap high rate of interest (Table 6.11).

6) Results of conflict resolution pattern and monitoring practices of community forests:

Conflicts related to illegal collection of forest products, and cutting of trees was resolved through cautioning and imposing penalties. The worked out figures of the number of offenders and types of penalty of each CFUG regarding illegal activities in the forest area show that conflicts related to illegal forestry activities were resolved through imposing penalty and providing cautioning the offenders. The operational rules of penalties and fines of each CFUGs varied from one to another. The total number of absentee offenders was high (35) from five CFUGs followed by grazing offenders (25) from two CFUGs, forest product harvesting offenders (15) from three CFUGs, timber-cutting offenders (9) from four CFUGs and fair offenders (5) from three CFUGs respectively (Table 6.12). Any member of CFUG with a major harvesting tool entered into the community forest was strictly prohibited unless such member was allowed to do so by the executive committee of CFUG.

Regarding the existing monitoring practices of CF in the study area, the worked out figures show that most CFUGs had lack monitoring by the DFOs and if visited to few of CFUGs, they emphasized only the conservation objective i.e. forest cover. Even though unit level forest agencies, i.e., *Ilaka* forest post was emphasized the budget and conservation objective. Only the CFUGs were concerned the community development objective focusing the use and management of CF. However, there was no apparent monitoring practice from both the forest agencies and community on livelihood impact of the management of CF to the local poor and the disadvantaged groups (Table 6.13).

7) Results of absolute and relative dependence on community forests by sampled caste/ethnic and income groups of households:

Regarding the testing of victim hypothesis into Nepal's community forestry to investigate absolute and relative dependency on CF or to what extent community forestry had been contributed to the household level welfare (income) to the different caste/ethnic and income groups of households, the results clearly showed differences in the amount of forest products harvested and gross income derived by the different caste/ethnic groups and income class's households (Table 7.2, 7.3, 7.4 and 7.5). The *Newar* households obtained annually much more gross CF income (NRs 6,393) and net CF income (NRs 2,229) from CF followed by the *Brahmin/Chhetri* (NRs 5,837) and (NRs1,541), *Janajati* (NRs 5,370 and (NRs1,714) and the *Dalit* (NRs5,108 and (NRs1,413) respectively (Table 7.8 and 7.10). This indicates that *Newar* households were more dependent on CF followed by the *Brahmin/Chhetri, Janajati* and *Dalit* households. This means that the

dependency on commons was not positively related to the degree of caste/ethnic groups (high and low caste/ethnic). Because *Newars* were getting higher level per household gross and net CF income than the *Brahmin/Chhetri* households. *Brahmin/Chhetris* were less dependent on CPR than *Newar* households. *Dalit* households were less dependent than the rest of other caste/ethnic groups on CPR in terms of gross and net value/income from CF. Thus, the distribution of gross and net income among the different caste/ethnic groups indicates that both the gross income and net income from CPR was an increasing function of household wealth endowments rather than degree of so called high and low caste/ethnic groups.

Likewise, forest dependent poorer households in the local communities obtained much less gross and net value/income from community forests than the middle income and the rich households. Poor households were less dependent on CF, in absolute term, than the non-poor households or the rich and middle-income households. On the other hand, the non-poor households were more dependent on community forests in absolute term, than the poor income households. Because gross household CF income to total household income were far less for the poor income groups as Rs.3,236 (18.6 percent) than the rich income groups as Rs.7,786 (44.7 percent) and the medium income groups as Rs. 6,397 (36.7 percent) per year from the community forests respectively. Similarly, poorer households were getting lower net value/income (NRs 567) from CF than wealthier households (middle-income households (NRs 1,928) and the rich income households (NRs 2,769) (Table 7.9 and 7.10). Thus, in terms of absolute contribution of forests to the total household income, community forests contribute more to non-poor households in comparison to the poor households. For example, households that benefited more from CFs were members with higher caste, large land holdings and herds of livestock who had the capacity to use intermediate forest products such as timber for plough, leaf litter, fodder and grass products.

In terms of relative dependence, i.e., in terms of the percentage contribution of forests to total non-CF cash income, the study showed the mixed results to the previous findings. The results suggest that gross income from CF as a percentage of total non-CF cash income was lower for *Brahmin/Chhetri* households (14.0 percent) than those for *Newar* (21.8 percent), *Dalit* (16.6 percent) and the *Janajati* households (14.1 percent) (Table 7.15). *Brahmin/Chhetri* households had lowest net income from CF as a percentage of total non-CF cash income than the lower caste even than the *Dalit*. For example, the average percentage of net CF income relative to total non-CF cash income of *Newar* households was higher (7.6 percent) followed by *Dalit* (4.6 percent), *Janajati* (4.5 percent) and the *Brahmin/Chhetri* (3.7 percent) respectively (Table 7.16). Similarly, in terms of relative dependence, wealthier households were less dependent on CPRs than

poorer households were. For example, gross income from CF as a percentage of total non-CF cash income was lower for non-poor households i.e. middle-wealth households (15.6 percent) and richer households (13.1 percent) than the poorer households (18.2 percent) (Table 7.17). This means poorer households were more dependent on CPRs, in relative terms, than those of non-poor households. Contrary to the absolute dependency relationship of CF with different income classes, the relative dependency relationship between CPR income and household income was likely to be the decreasing function of the level of household non-CF income for the poor income households and vice-versa. On the contrary, poorer households had lower net income from CF as a percentage of total income than the non-poor households. For example, the average percentage of net CF income relative to total household income of the poor households was lower (3.2 percent) than the non-poor households (4.7 percent) (Table 7.18).

8) Results of distributional implications of community forests on sampled caste/ethnic and income groups of households:

Another interesting result from this study is the distributional significance of comparing net and gross income from community forests. A straightforward comparison of gross income showed that the *Brahmin/Chhetri* households had lower gross value/income from CF as a percentage of total income than other caste/ethnic groups. On the contrary, the richest classes of households gained the most from CF, the middle-income classes gained less than the rich and the poorest households gained the least. However, when the net income from CF across these caste groups and income categories are compared, then an interesting inverted U shaped relationship emerges. In terms of net income (taking all costs into consideration), the average percentage of net CF income relative to total household income of *Newar* households was higher (7.6 percent) followed by the *Dalit* households (4.6 percent), *Janajati* households (4.5 percent) and the *Brahmin/Chhetri* households (3.7 percent) respectively (Table 7.19). The poor, on average, obtained 3.2 percent of total household income from CPRs, middle-income households obtained 4.7 percent of total income from forests and the rich households obtain 4.7 percent of their total net income from forests (Table 7.20). It seems that the relative dependence on forest resources declines as income increases. This study, however, uses cross sectional data and categorical data on income. Therefore, it would be better to think the results in a suggestive way rather than conclusive end.

9) Results of econometric analyses:

The econometric analyses carried out in this study support the notion that the so called higher caste and richer households with more land and livestock assets gained the most from community forests. Analysis of the determinants of household level income through regression analysis indicates a strong relationship between household's asset

endowments and dependency on community forests. In other words, household wealth such as land and livestock holdings, literacy status, caste/ethnicity, income status of households and gender exert considerable influence on collection of forest products at the household level (Table 7.21 and 7.22).

Regarding gender, the regression analysis clearly shows that those households headed by male members benefited less from CF than those with female heads. This means that men might not involve as far as women to pull out forest products due to the household financial responsibilities and other socio-political obligation. The assumption that the higher number of the literate members in the family might be positively related to household-level benefits/income from community forests was accepted positively and significantly by the regression result. Most forestry activities in the rural areas appeared to be the phenomenon of work of illiterate and literate people. This finding is dissimilar to that of (Gunatilake, 1998; Yanggen & Reardon, 2001, & Adhikari, 2003). With regard to the regression result of transaction costs day, the income from CF seems negatively associated with transaction days against the assumption that households who spent more time/days on decision-making, implementation and monitoring activities appeared to obtain more income from different forest products. Among the poor and non-poor income groups of households, the income from CF seems negatively associated with transaction days. Contrary to this, among the caste groups, the income from CF seems positively associated with transaction days (Table 8.8, 8.9 and 8.10).

Regarding the regression analyses of the number of more CFUG membership and the household level CF income, the coefficient result appears positively and significantly related to the forest income than the households belong to only one membership of CFUG. These might be because if household membership possession of more than two CFUGs, only those high class and rich income households got more forest products (CF income) from other additional CFUGs. Realizing the benefits generated from membership possession of more than two CFUGs was impossible for the lowest caste and the poorest households because they did not have ability to pay the required users' fees to enter into the more than one CFUG.

Likewise, the representation in forest users' executive committee as a key post or member influences the income from CF. Regarding this, the regression analyses shows that membership representation by household in 'forest users' executive committee' had positive relation to forest income than the household not represented in 'forest users' executive committee'. These may be because being a member in the FUEC gets correct information by engaging in the decision-making process about when, where and how to collect.

A good forest condition can be seen in community forests if the community forest has covered by more than 75 percent green forest species. It was assumed that good forest condition where (more than 75 percent green covered by forest species) had positively and significantly related to the forest income. Contrary to this, the regression result shows that the good forest condition was found to be negatively associated with the forest income, which is against the welfare notion of community forestry. Similarly, the regression result shows that the broadleaved forests were positively associated with the forest income while plantation of pine trees did not serve requirements of users which had very limited use in people's livelihoods and it was negatively associated with forest income.

Regarding the distance to community forests, the regression result proves that the distance to community forests is negatively and insignificantly related to the forest income. On the other hand, near distance of the forest is positively related to the forest income. Similarly, the regression analysis shows that the market distance determines the household level CF income to be positively if it is far (in KM) from the house and negatively if it is near (in KM) from the house. The availability of market near the house may divert the people from forest dependent activities due to alternate earning opportunities. Thus, access to markets seems to offer people with alternative livelihood opportunities and hence minimize dependence of families on community forests.

10) Results of benefit-cost and externality analyses:

A simple benefit-cost analysis employing in this study supports the notion that there are inequitable system of benefit distribution and cost sharing among the forest user households in rural Nepal where richer households with more land and livestock assets gain the most from community forests than the poorer households. The results of benefit-cost analysis in terms of gross income and gross cost, net benefit and benefit–cost ratio clearly show differences in gross income derived and the gross cost incurred by households in different caste/ethnic and income groups (Table 8.1 to 8.10). The worked out figures shows the difference between the average household gross value and the gross cost among the caste/ethnic and income groups of households. Average household gross value and gross cost for each of the *Brahmin/Chhetri, Newar, Janajati* and the *Dalit* was NRs 1,540 and NRs 4,297, NRs 2,229 and NRs 4,164, NRs 1,714 and NRs 3,656 and NRs1, 414 and NRs 3,694 respectively. The differences between average household gross value and gross cost or the average household net benefits among them was NRs 1,540, NRs 2,229, NRs1, 714 and NRs1, 414 respectively. This means the average percentage differences of household level benefit and cost i.e. net benefits of CF was positive for *Newar* (28.2 - 26.3 = 1.9) and *Janajati* households (23.6 – 23.1 = 0.5)

and negative for the *Brahmin/Chhetri* (25.7 – 27.2 = -1.5) and the *Dalit* households (22.5 – 23.4 = -0.9). Hence, the benefit–cost ratio (B/C) for the *Newar* and the *Janajati* households was more than one (1.07 and 1.02) and it was less than one for the *Brahmin/Chhetri* and the *Dalit* households (0.94 and 0.96) (Table 8.12, Figure 5 and 6).

Similarly, average gross cost for *Rich was (*NRs 5,017 or 41%), Middle income (NRs 4,469 or 37%) and *Poor* (NRs 2,669 or 22%), (Table 8.7). Average percentage differences of household level benefit and cost i.e. net benefits of CF was positive for rich (45.0 – 41.0 = 4.0), zero for middle income group (37.0 –37.0 = 0) and negative for poor income groups of households (18.0–22.0 = -4.0) respectively (Table 8.11a and 8.11.b.). Consequently, the benefit–cost ratio (B/C) for the rich households was more than one (1.09), middle income group (1) and the poor income group (- 0.81) respectively (Table 8.13 Figure 7 and 8). Hence, the results of externality analysis showed that among the caste/ethnic groups, the *Brahmin/Chhetri* and the *Dalit* households failed to internalize the benefit from CF as per the total gross cost per household incurred by them. The *Newar* and the *Janajati* households were being able to internalized the benefit from CF by externalized the total gross cost on the *Brahmin/Chhetri* and the *Dalit* households. On the other hand, the poor income households were failed to internalize the benefit from CF as per the total gross cost per household incurred. The middle income households were being able to internalize by equalized both of gross benefit and the total gross cost. The rich income households were being able to externalize the total gross cost on the poor income households to gain disproportionate net benefits from CF. Thus, it is concluded that in case of benefit accrued (positive externality) and gross cost incurred (negative externality) of CF use and management by different caste/ethnic and income groups of forest users' households, the externalities of CF had not created equity efficiencies within and between the caste/ethnic and income groups of households in the study area.

9.3 Recommendations

The potential of community forest management by people participation to secure basic needs for local people giving priority to poor community and to reduce rural poverty by improving the well-being of poor is frequently advocated in Nepal and elsewhere. Although, environmental value by vegetation cover (bio-physical condition) of forest resources were found remarkably enhanced since the forest resource management regime shifted from state to local community participatory management, however, due to the lack of relationship about different linkages between rural poverty and environmental/ natural resources, equitable distribution of forests resources as a CPRs within the rural

community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated.

Overall, the study findings seem to suggest that because of the dependence in absolute terms on intermediate products, the so called higher caste/ethnic and rich households with assets endowment gained more from CF than the so called lowest caste/ethnic and the poorest households in the rural Nepal. On the contrary, in relative terms, the higher caste and richer income class of households gained the least from CF and the lowest caste and the poorest households gained the most from CF due to the low non-CF cash income for the poorer income households than the higher caste and the non-poor income households. The results also suggest a negative relationship between net CPR income and caste group i.e. the *Brahmin/Chhetri* households had lower net income from CF as a percentage of total income than other caste/ethnic groups. On the other hand, the results suggest a possible positive relationship between the net CPR income and the wealth-ranked groups, i.e., the poor income households had lower net income from CF as a percentage of total income than the rich and middle-income households due to the high share of transaction costs of community forest management for the poorer income group than the non-poor income groups.

As per the conclusion of externality analysis in case of benefit accrued (positive externality) and gross cost incurred (negative externality) of CF used and management by different caste/ethnic and income groups of forest users' households, the externalities of community forest management had not created equity efficiencies within and between the caste and income groups of households in the study area.

Thus, this study raises the concern of whether conservation-oriented measures that promote regulated systems of forest management in Nepal undermine social goals such as equitable distribution of benefits and costs, however, in relative terms, the poorest households were more dependent on community forests. It is reasonable to require that policies aimed at allocating natural resources should not eschew equity considerations altogether (Tsur & Dinar, 1995). Some scholars such as (Majone, 1993) argue that policy changes in CF management should not be precipitated by ideas about conservation and efficiency, rather, they need to be fully cognizant of redistributive concerns. CF interventions, to some extent, are unable to recognize that resources often have multiple users, who are characterized by different use patterns and conflicting interests. Thus, there is a risk that CF will focus on long-term accumulation of timber and ecological service values in order to meet the need of external donors, central government and the local elites, whereas this might reduce opportunities available for the poor.

There is a strong argument to be made that CF in Nepal is incentive-incompatible

(Adhikari, 2003). Traditionally, poorer households were dependent more on local forests for firewood and other NTFPs. Conversely, with the introduction of usufruct property right regimes in forestry, the access of poorer households to forests has been reduced due to a restrictive management regime that yields negative benefits to lower caste and poorer income groups in comparison to non-poor income groups. Based on the findings of this study, some specific recommendations have been prescribed for the equitable use and internalizing the externalities of CF which are as follow:

1) Class and income dichotomy concept of poverty should shift towards across the socio-demographic and economic indicators to capture the distinctive nature of multidimensional aspects and causes of poverty so that the nation could escape the absolute poverty. The results of poverty analysis of this study suggest that poverty is not the plight of the lower cast and the poor income groups only and prosperity is not the fate of the high caste and the rich income groups only.

2) Zero representation of both male and female from the *Dalit* households and most females from most caste groups in all the key designation and representation of less than 20 percent of female members (against the provision of one third of the user's executive committee) in the overall local forest user's executive committee, the decision-making process seem to be likely biased in favor of sex and high caste households. Consequently, in such a discriminatory representation in the entire forest user's executive committee in the study area (Table 6.1, 6.2, 6.3a and 6.3b), one could hardly expect equal benefit from the communal management of common property forest resources through active participation by all the users. Therefore, in order to ensure that the interests of lower caste and poorer households are fairly represented in an operational regime, it may be necessary to require that the number of lower castes, poorer and occupational households as well as women on the FUEC should at least be proportional to their numbers in the community. Equally important is supporting and empowering them through CFUGs in various aspects of CF management that especially focus on poorer forest-dependent households so that their interests are adequately represented in forest planning and management decisions.

3) The coefficient result of regression analyses suggests that the number of more CFUG membership is positively and significantly related to the household level CF income than the households belong to only one membership of CFUG. Realizing the benefits generated from membership possession of more than two CFUGs is seen a function of the socio-economic influence of high class and rich income households. Since, the lowest caste and the poorest households do not have ability to pay the required users' fees to enter into more than one CFUG. Therefore, there should be provision of membership possession in only one CFUG.

4) Realizing the benefits generated from the CFUG's fund in terms of lending and expenditure by most CFUGs was seen in favor of socio-economic influence of high class and rich income households. Therefore,

large portion of CFUG fund should be diverted for to generate income/employment and for more forest production instead of to reap the high rate of interest.

5) Most CFUGs had neither apparent monitoring systems nor practices on livelihood impact of CF on local poor and the disadvantaged groups. The DFOs and their subordinate staffs on behalf of government visit seldom to few CFUGs emphasizing only the conservation and budget objectives. Moreover, it is necessary to change of the Department of Forest (DOF's) perception of good FUG which is dominated by criteria such as good forest and good bank balance, and hence monitoring of the livelihood impact of community forest management is not observed an area of their explicit interest. Therefore, regarding monitoring systems and practices of CF, the existing attitude and capacity of DOFs and FUECs should be changed for the dynamic links among 'CFUG decisions', 'human actions', 'ecological processes of the forests' and the 'equity in forest products sharing'.

6) Even with supportive Forest Act (1993) and Forest Regulation (1995) in place, the role of the forest officer is limited to assist the CFUGs only in the development of an Operational Plan. Given the small size of many of the forest areas, a forest officer may be overwhelmed with the development, approval, and monitoring of a large number of Operational Plans that in total cover only a small area. Therefore, community forestry monitoring requires changes in the orientation of forestry department to work effectively with communities with the training of personnel and financial resources. Forestry extension activities through community forest has now become matured in the area of forestry sector in Nepal, yet to work effectively with local community forest users' groups require the retooling of forestry staffs to shift from perceiving people as the problem to as part of the solution.

7) Tree planting on community forests should be understood in light of local systems of people's livelihood and importance of forest species in meeting diverse needs of local poor inhabitants. Thus, FUGs should set up output sharing systems that deal with the special needs of the lowest caste/poorest marginalized and occupational households in the community who have relatively a high level of dependence on CPRs.

8) In the context of equity inefficiencies (inequality between benefit accrued (positive externality) from CF and gross cost incurred (negative externality) of CF use and management) within and between the caste and income groups of households, the contribution of CF as common property resources has been seen more to the rich and middle-income households compared to the lowest caste (*Dalit*) and the poor households. Hence, the current practices of community forest management have negative impact on them that lacks the provisions for addressing equitable system of benefit distribution and cost sharing among the forest user groups of households. Therefore, policy reconsiderations of benefits to each from commons according to costs (internalizing the externalities) for equity

efficiencies of CF is required urgently for addressing equitable system of benefit distribution and cost sharing among the forest user households.

9) To make ecological balance with environmental justice, strict provision of plantation at the rate of depletion should establish and to seek appropriate equitable system of benefit distribution and cost sharing among the forest users, the taxation on commons should impose on the basis of per household net benefit and the benefit-cost ratio in Nepal's forestry sector in general and entire CFUGs in particular.

10) Since the poor and marginalized households could not afford the tax on commons. Therefore, one reasonable substitute would be to include leasehold forestry provisions focusing to them on the basis of environmental service payment i.e. higher the payment for more vegetation of dry area of forest land within the management regimes of community forestry. Consequently, greenery may increase in dry area by the use of disguised labour force of rural poor at a time. Thus, provision of leasehold community forestry options within a common property arrangement may be one way to move toward conservation and social goal of community forestry at a time.

11) Most users' rights of forest products are found non-transferable. Moreover, users are not allowed to sell their private share of the forest products in the market under the existing system of CF management. Therefore, one reasonable substitute would be to include private property rights provisions under the system of transferability of property rights within CF management regimes. If property rights cannot be transferred, households poorly endowed with lands and livestock benefit less from commons. Voluntary exchange of rights within overall restrictions on resource-use may increase benefits to poorer households. (Posoner, 1977 as quoted in Bromley, 1989; Baland & Platteau, 1996). Thus, private property options within a common property arrangement may be one way to move toward more equitable distribution of benefits among heterogeneous social and economic groups.

12) Household and community characteristics and relevant management regimes need to be carefully considered when handing over the forests from government command ownership to user's communal ownership and management in local communities. Since poor people do not get substantial benefits from agricultural related forest products, forest management policy needs to be directed at increasing alternative forest products, mainly NTFPs that played a significant role in supplying livelihood needs to the poor households.

13) The main reason of community forestry not to be poverty responsive may be the basic policy objective remains only the fulfillment of subsistence needs and its failure to take into account well being benefit approach. Therefore, if community forestry is to be rural poor friendly, this weakness in policy should be changed. Moreover, the community forestry policy should go beyond subsistence attitudes and take into account well being benefit approach. More resource generation from CF depends on

more types and volume of forest products through the productive attitudes of policy rather than rely on conservation of nature gifted available resources. Therefore, to make the bigger cake for equal distribution, there should policy reconsiderations about encouragement of co-investment between multi sector stakeholders and NGO-community partnership programmes for more production of forest products within the CF.

14) Regarding the future perspective of the research, the issues on further comparative study of organizational development processes of CFUGs, participatory action research for various ecological belt and socio-economic circumstances and explore market and forest product development potential at commercial (beyond subsistence) levels based on time series information would contribute to a richer analysis on the complexity involved in poverty, inequality and distributive consequences of regulated forms of CPR regime. All these may help understanding comprehensively about dependency and externalities issues of CF. Since this study could not compare pre and post impact of CFs on household income and cost. It was difficult to get historical data (especially on labour time allocated to gathering and collection of forest products) when forests were under the government control.

The conclusions arrived at this study are expected to initiate a process of reflection among policy makers and stakeholders to look for ways so that the policy formulations processes should based on broader premises of rural livelihoods rather than the issue of forest conservation alone and community forestry may be modified to positively impact the livelihood of the poorer sections of the community.

APPENDICES

Appendix-A

Questionnaire for the Household Survey – Set 1

Name of Researcher: Name of Interviewer:

Name of FUG: Village/Ward:

Name and Caste of Household Head: Age .....

Date of Interview:

A. Demographic Information

Q.1. Please provide the following household level socio-demographic information

HH Members	Age (year)	Sex (M/F)	Educational Status*	Occupation**	
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

* 1= Illiterate, 2= Literate, 3= Primary education, 4= Secondary education, 5= Higher secondary, 6= Graduate, 7= Post graduate

** 1= Agriculture, 2= Business, 3= Public Service, 4= Private Service, 5= Cottage Industry, 6= Agriculture+ Business, 7= Agriculture+Service, 8= Wage Labur and 10= Other (Please Specify...)

Q. 2 Has any members of your family has been out of home for more than six months?

( ) Yes: Got to Q. 3 ( ) No: Go to Q. 4

Q. 3. Where and on what occupation they are working?

S.No.	HH member	Age	Sex (M/F)	Occupation	Place of Work
1.					
2.					
3.					
4.					
5.					

B. Land Holding and Agriculture Production

Q.4. Please give the following information of landholding ownership, agricultural production and local prices of agriculture products.

Land Characteristics	Land Type and Area (In Ropani)		
	Own land	Rented in	Rented out
Irrigated Land (Khet)			
Unirrigated Land (Bari)			
Marginal land (Khoriya, Pakho)			
Others (House yard, kitchen garden etc)			
Total Land			

Q. 5. What are the major crops you have produced in the past year and annual income from selling agriculture products?

S.N.	Unit	Total production	Unit Sold	Unit Price (Rs.)	Total Income (Rs)
Rice					
Maize					
Millet					
Wheat					
Legumes					
Mustard					
Barley					
Fruits					
Potatoes					
Vegetables					
Others					

Q.6 What are the approximate value of the following household assets?

S.No.	Asset	Value/price
1.	Building/ houses	
2.	Gold/silver etc.	
3.	Bed cloths	
4.	TV/radio	
5.	Kitchen utensils	
6.	Others	

Q.7 Which of the following livestock does your household own (now and before implementing the community forestry program) ?

S.No.	Type of livestock	Number of livestock	
		Before CF	Now
1.	Cattle		
2.	Buffalo		
3.	Goat		
4.	Sheep		
5.	Pig		
6.	Rabbits		
7.	Chicken		
8.	Others (please specify)		

Q.8. Please mention the annual income from sale of following livestock products?

Product	Unit	Total production	Unit Sold	Unit Price (Rs.)	Total income (Rs.)
Milk					
Meat					
Egg					
Wool					
Others					

Q.9 What was the income from the sale of live animals last year ?

Livestock	Unit	Unit sold	Unit Price (Rs.)	Total income (Rs)
Cattle				
Buffalo				
Goat/sheep				
Pig				
Chicken				
Others				

Q.10 Besides crop and livestock income, what are other sources of your family income?

Sources	No. HH member involved		Annual Income	(Rs.)
	Men	Women	Men	Women
Business				
Service				
Cottage				
Wage labour				
Remittance				
Pension				
Others				

Q.11 How long your own crop production can meet your household food requirement?

( ) <3 months ( ) 3 to 6 months ( ) 6 to 9 months

( ) 9 to 12 months ( ) > than 12 months

C. Natural Resource Management and Utilization

Q.12. What is your annual consumption of following forest products now and before the implementation of community forestry?

S.No.	Products	Unit	Annual Consumption	
			Before CF	Now
1.	Fuel wood			
2.	Tree fodder			
3.	Timber			
4.	Leaf litter			
5.	Grasses			
6.	Thatching grass			
7.	Fruits/Nuts			
8.	Herbal medicine			
9.	Others			

Q.13. What are the quantities of forest products available for your household annually from community forest and what amount from your own private forest?

Product	Before CF	Now*			Private Forest
	Unit**	CF1 (Unit)	CF2 (Unit)	CF3 (Unit)	(Unit)
Firewood					
Tree fodder					
Timber					
Leaf litter					
Thatching grass					
Fruits/nuts					
Herbal medicine					
Grasses					
Others					

* CFI Community forestry I, CF2 Community forestry 2, CF3 = Community forestry 3 (In case, household deserve the membership of more than one forest user group)

** Head load/Number/QBft. (one head load equivalent 45 K.G.)

Q.14 How forest products are distributed?

Family size/equity ( ) Equality ( )

Q.15 Are you satisfied with existing distribution process?

Yes ( ) No ( )

D. Forest Resource Harvesting/Utilization Costs

Q.16 How much time do you spend in collecting a unit of following forest product?

S.N.	Forest Products Unit	Unit	Collection Time/Days			Remarks
			Men	Women	Children	
1.	Firewood					
2.	Tree fodder					
3.	Timber					
4.	Leaf litter					
5.	Thatching grass					
6.	Ground grasses					
7.	Herbal medicine					
8.	Fruits/nuts					
9.	Others					

Q.17. How much time do you have to spend in traveling to and from your house in collecting following forest product?

S.N.	Forest products	Unit	Time	Responsible Person		
1.	Firewood			Men	Women	Children
2.	Tree fodder					
3.	Timber					
4.	Leaf litter					
5.	Thatching grass					
6.	Fruits					
7.	Herbal medicine					
8.	Grasses					
9.	Others					

Q.18 Do you pay any fees for harvesting the forest products from the community forest?

Yes ( ) No ( )

Q.19 If yes, how much do you have to pay (fees) for harvesting a unit of following forest products from the community forest?

S.N.	Forest Products	Unit	Unit Price (Rs.)	Remarks
1.	Firewood			
2.	Tree Fodder			
3.	Timber			
4.	Leaf litter			
5.	Thatching grass			
6.	Fruits			
7.	Herbal medicine			
8.	Grasses			
9.	Other			

Q.20 How much time required to spend for you annually in following obligatory activities of community forestry?

S.N.	Activities	Time Spent (Days)	Remarks
1.	FUG meetings		Decision making
2.	FUEC meetings		Decision making
3.	Thinning		Implementation
4.	Weeding		Implementation
5.	Afforestations		Implementation
6.	Road construction		Implementation
7.	Monitoring		Monitoring

Q.21 Is there any direct cash incur to your family annually for communicating, information gathering and traveling for community forestry related activities? If yes, what is the tentative direct cash expenses (Rs.)

Q.22 What amount you have to pay to remain as a member of Forest User Group?

(Once Rs.) (Annually Rs.) (Do not need to pay)

Q.23 How much number do you have possessed the membership of FUG?

Only one ( ) Two ( ) Three ( ) Four ( ) Five ( )

Q.24 What is the distance between your home and community forest? ( ) km

Q.25 How long do you have to travel to and from the community forest for animal grazing? Minutes ( ) Hours ( )

Q.26 Who in your family grazed? Men ( ) Women ( ) Children( )

E. Household Awareness/Participation/Policy issues in CPR Management

Q.27 When was the forest user group and executive committee formed? (BS 20)

Q.28 When was the community forestry handed over to the community (BS)

Q.29 Do you participate in users annual/monthly assembly?

Yes ( ) No ( )

Q.30 Are any women members from your household represented in users committee?

Yes ( ) No ( )

Q.31 How do you evaluate the performance of users committee?

Highly satisfactory ( ) Satisfactory ( ) Neutral ( ) Not satisfied ( )

Q.32 At what stages do you and your family members participate in organization activities?

Planning and decision-making ( ) Implementation ( )

Benefit sharing ( ) Evaluation ( )

Q.33 How do you evaluate the rate of your and family members participation in FUG activities?

Strong participation ( ) Occasional participation ( )

Not very often ( ) Hardly ever ( )

Q.34 How do you know when to collect various forest products?

Attending committee meeting ( ) Informed by committee members ( )

Informed by neighbours ( ) FUG assembly ( )

Q.35 What are the advantages and disadvantages of membership of the Forest Users Group?

S.No.	Advantages of Membership	Disadvantages of Membership

Q.36 What is your perception regarding equity issue in community forestry?

Equity Issues	Y/N	How?
Are you relatively satisfied with existing institutional arrangements?		
Have you even been disadvantaged by institutional arrangements?		
Is allocation of membership rights in organization fair?		
Has distribution of resources and wealth change?		
Are costs and benefits of resource management based on individual's ability to pay?		
Others (please specify)		

F. Natural Resource Quality and Management

Q.37 According to your idea, what is changing trend of the following indicators in the last 10 years?

Indicators	Trend		Remarks
	Increasing	Constant	Decreasing
Crop production			
Area under forest			
Area under pasture			
Tree species			
Number of water spring			
Time to collect fuel, fodder and leaf litter			
Tree on private land			
Flooding/landslides			
CF related employment opportunity			
Time to fetch water			

Q.38 In your opinion, what were the likely effects of institutional change i.e. from state management to community-based management in local livelihoods?

Impacts	Strongly Agree	Agree Disagree	Disagree Strongly
Increase equal access to resource base			
Threat alternative livelihood			
Unnecessary restriction			
Excessive collection charge			
Help reduce poverty			
Able to meet the household demand			
Decrease access to CF			

G. Miscellaneous

Q.39 Are you or your family members are associated/participated in any village level development organization?

Yes ( ) No ( )

Q.40. If yes, please provide following information?

S.No.	Name of Organization	Type*	Nature of work**	Number involved		Position held	Remarks
				Female	Male		
1.							
2.							
3.							
4.							

Local informal = I Local formal = 2 Saving and credit~=1 Conservation=2 Women's organization4, Village cooperative=5 Government 3NGO=4 Agriculture/livestock production = 3 Others=6 (specify)

Q.41. Do you need credit for your livelihood activities? ( ) Yes Q. 4h If yes, where do you go for credit?

Bank ( ) Land lord ( ) Neighbour ( ) Relatives ( ) Co-operatives ( ) others ( ) (please specify)

Q.42. How does FUG investing the surplus fund for various community development activities?

S.No.	Investment	Are you benefited from this investment		If no, give the reason
		Yes	No	
1.	Drinking water			
2.	Rural road			
3.	Irrigation scheme			
4.	Temple			
5.	School			
6.	Health Post			
7.	Community House			
8.	Others			

Q.43. What is the trend in employment opportunities in the past 10 years in your area?

S.No.	Nature of Employment	Increasing	Decreasing
1.	Forest-based opportunities		
2.	Agriculture-based opportunities		
3.	Cottage industry based opportunities		
4.	Government		
5.	Non-Government		
6.	Private sector		
7.	Others		

Q.44. Do you have any suggestions regarding the improvement of existing situation especially equity aspects of community forestry? How community forestry will be more profitable and sustainable?

Appendix-B

Questionnaire for Forest User Executive Committee – Set 2

Name of Community Forest: Number of User household:

Date of FUG Formation: Date ofHandover:

Area:

1. What are the income generating (IG) activities in community forest?

S.N.	IG Activities	Area	Beneficiary Households

2. What are the income sources for Forest User Group?

S.N.	Income Source	Remarks

3. What commodities are being extracted for commercial purpose so far?

S.N.	Commodity	Unit	Quantity	Total incomes

Q 4. How does FUG investing the surplus fund for various community development activities?

S.No.	Investment	No. of Beneficiary Households	Remarks
1.	Drinking water		
2.	Irrigation scheme		
3.	School		
4.	Temple		
5.	Health Post		
6.	Rural Access Road Foot Path		
7.	Community House		
8.	Others		

5. When FUG members gather for meeting?

( ) Once a month ( ) Once a two months ( ) As and when required

6. When the meeting of executive committee held?

Once a month ( ) Twice a month ( ) As and when required ( )

7. What is the percentage of user household who attend last 4 meetings?

8. What is the parentage of user committee members who attended last 4 meetings?

9. How do you evaluate the institutional performance of Forest User Group? (1= Least satisfactory and 5= Highly satisfactory)

S.N.	Name of Committee members	Rating				
		1	2	3	4	5

10. Does income generating and other activities undertaken by your group has been followed in neighboring areas?

Yes ( ) No ( )

11. What is the composition of Forest User Group Executive Committee in terms of gender?

Number of female ( ) Number of male ( )

12. How user groups were formed?

( ) Initiative from Forest Department ( ) Community's own initiative

13. How decision of executive committee is made?

Consensus () Majority ()

14. What is your suggestion regarding institutional development and distribution system of community forestry program?

Appendix-C

Box 1: Challenging the downward spiral of poverty–environmental degradation

The Middle Hills of Nepal

A classic example of revision to the I=PAT equation lies in the alleged cycle of population growth leading to deforestation and erosion in the Middle Hills of Nepal. In 1977, Eckholm wrote: Population growth in the context of a traditional agrarian technology is forcing farmers onto even steeper slopes, slopes unfit for sustained farming even with the astonishingly elaborate terracing practiced there. Meanwhile, villagers must roam further and further from their houses to gather fodder and firewood, thus surrounding villages with a widening circle of denuded hillsides. This quotation, which in many ways summarizes a downward spiral of poverty and environment, has been criticized in Nepal by a number of researchers. Criticisms point out, for example, that the underlying forces of environmental change are the result of long-term and complex biophysical processes such as tectonic uplift, and that farmers adapt organizational and land management practices to reduce the impact of population growth and environmental change, such as by using local landslides to increase soil fertility (Ives and Messerli, 1989).

The Hills of Northern Thailand

Further research has also challenged the Himalayan crisis model in other locations. In northern Thailand, research of agriculture on steep slopes has indicated that increasing population has not led to the increased use of steeper slopes. Instead, farmers realize that increase cultivation of steep slope leads to erosion and as a result avoid cultivating steep slopes. Research also suggests that much sedimentation from the hills is unrelated to agriculture, but instead originates from naturally occurring gullies (Forsyth, 1996).

The inland valleys of Papua New Guinea

Much orthodox thinking assumes that shifting cultivation degrades soil and forests in a wasteful way, particularly when increasing populations means that the fallow periods get shorter. Research in Papua New Guinea among the Wola people of the central highlands, however, has indicated that soils are kept fertile for long periods by the use of indigenous soil conservation methods, and particularly the use of soil mounds incorporating compost in conjunction with the cultivation of sweet potato. As a result, intensive agriculture can continue despite increasing population (Sillitoe, 1998).

Southern Bolivia and the Andes

It is commonly stated that increasing population and the collapse of mining in the mountains of Bolivia have led to a downward spiral of poverty and environmental degradation. Research has indicated that households may diversify income through a variety of activities. Furthermore, biophysical research of sedimentation has indicated that much erosion predates current agriculture (Preston, 1997).

The forest-savanna transition zone of Guinea

The landscape of Kissidougou in the West African Republic of Guinea has conventionally been interpreted as degraded, with forest patches the surviving relics of once extensive forest cover, as a result of destructive short-term land uses by local farmers. However, research of forest histories has indicated that these forest patches do in fact farmers create new zones, and that forest cover has actually increased, not decreased (Fairhead and Leach, 1996).

Machakos district of Kenya

Research in this semi-arid zone has indicated that despite the five-fold increase in population between 1930 and 1990, there has been 'more people, less erosion'. Local conservation measures such as terracing and complex land management, have resulted in an improvement in environmental standards. However, other research has suggested that such economic improvements have been socially differentiated, and that some land improvement has been lost because of migration to cities by skilled farmers Tiffen et al, 1994; Rocheleau et al, 1995; Murton, 1997).

The Northern Nigerian Sahel

Similarly, research in the Kano region of Northern Nigeria has shown that farmers may maintain high agricultural yields despite population densities in excess of 200 people per square kilometer through adopting a combination of different crops, livestock and trees. Farmers also protect their access to food by keeping distinct seed crops suited to different climatic conditions, and supplement incomes during drier years by increasing ownership of goats and sheep, and migrating to cities for short-term paid employment. Indeed, many farmers have also returned to the practice of collecting wild seeds for food crops in addition to gaining supply from commercial sources (Adams and Mortimore, 1997).

Source: Tim Forsyth: Poverty and Environment

Name of FUGs	Brahmin/Chhetri				Janajati				Newar				Dalit			
	R*	M#	P@	Tot	R	M	P	Tot	R	M	**P**	Tot	R	M	P	
1.Salghari	6	7	5	18	3	5	7	15	3	5	5	13	1	1	1	3
Surveyed HHs	2	3	1	6	1	2	2	5	1	2	2	5	1	1	1	3
2.Salleri	5	10	3	18	9	21	51	81	1	20	4	25	2	3	3	8
Surveyed HHs	2	3	1	6	3	7	16	26	1	6	2	9	1	1	1	3
3.Cha Bar	6	6	3	15	3	33	33	69	0	0	0	0	3	1	3	7
Surveyed HHs	2	2	1	5	1	10	10	21	0	0	0	0	1	1	1	3
4.Rupadhari	3	6	0	9	6	20	20	46	3	3	0	6	0	0	0	0
Surveyed HHs	1	2	0	3	2	6	6	14	1	1	0	2	0	0	0	0
5.Khorsane	3	14	1	18	3	6	2	11	2	6	1	9	0	0	0	0
Surveyed HHs	1	4	1	6	1	2	1	4	1	1	1	3	0	0	0	0
6.Oiputang	3	3	3	9	10	10	24	44	0	0	0	0	3	9	10	22
Surveyed HHs	1	1	1	3	3	3	8	14	0	0	0	0	1	3	3	7
7.Arunganga	20	15	8	43	6	6	16	28	3	3	10	16	3	3	3	9
Surveyed HHs	6	5	3	14	2	2	5	9	1	1	3	5	1	1	1	3
8.Panchakanya	7	0	2	9	3	3	6	12	10	10	6	26	3	6	3	12
Surveyed HHs	2	0	1	3	1	1	2	4	3	3	2	8	1	2	1	4
9.Banchharedanda	10	27	23	60	23	20	14	57	0	0	0	0	9	10	15	34
Surveyed HHs	3	8	7	18	7	6	5	18	0	0	0	0	3	3	5	11
10.Jalashinghadevi	15	4	6	25	0	9	3	12	5	2	2	9	0	0	0	0
Surveyed HHs	5	1	2	8	0	3	1	4	1	1	1	3	0	0	0	0
11.Dakshinkali	6	2	2	10	9	6	20	35	5	2	3	10	0	0	0	0
Surveyed HHs	1	1	1	3	3	2	6	11	1	1	1	3	0	0	0	0
12.Arunodaya	26	20	12	58	0	0	0	0	0	0	0	0	0	0	2	2
Surveyed HHs	8	6	4	18	0	0	0	0	0	0	0	0	0	0	1	1
13.Tarevhir	12	9	6	27	6	15	21	42	0	0	0	0	6	9	10	25
Surveyed HHs	4	3	2	9	2	4	7	13	0	0	0	0	2	3	3	8
14.Barne Belayate	10	53	13	76	0	3	0	3	0	1	0	1	0	3	0	3
Surveyed HHs	3	16	4	23	0	1	0	1	0	1	0	1	0	1	0	1
15.Shivaratri Ghat	30	10	20	60	10	6	8	24	0	0	0	0	0	3	3	6
Surveyed HHs	9	3	6	18	3	2	3	8	0	0	0	0	0	1	1	2
16.ChyangriPasini	10	9	0	19	3	3	0	6	10	6	0	16	3	3	0	6
Surveyed HHs	3	3	0	6	1	1	0	2	3	2	0	5	1	1	0	2
Total Households	171	195	112	474	92	164	231	485	44	58	36	131	27	41	53	121
TotalSurveyedHHs	62	59	37	158	29	51	76	156	10	18	14	42	10	15	18	43
Percentage	31.5	31.7	33.9	32.2	31.5	32.3	31.6	31.8	31.8	32.7	38.8	34	40	36.5	33.9	35.5

ANNEXES

Annex Table 1–A Total and Sample households by Caste/Ethnic Groups & Income Classes

Source: Field Survey, 2003.

Note: R*= Rich Households, M# = Medium Households, P@ = Poor Households

Annex Table 5-A Distribution of Sample Population by Caste/Ethnic and Sex in Study Area

Caste/Ethnic Groups

Name of CFUGs	Dalit			Janajati			Newar			
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male
1. Panchakanya	13	13	26	9	8	17	21	20	41	6
Percentage	50	50	26.26	53	47	17.17	51	49	41.41	40
2. Dakshinkali	0	0	0	37	30	67	11	11	22	9
Percentage	0	0	0	55	45	63.20	50	50	20.75	53
3. Arunganga	8	7	17	36	23	59	14	11	25	44
Percentage	47	53	100	61	39	100	56	44	100	47
4. Oiputang	19	27	46	33	37	70	0	0	0	5
Percentage	41	59	100	47	53	100	0	0	100	42
5. Jalasinghadevi	0	0	0	14	9	23	9	13	22	14
Percentage	0	0	100	61	39	100	41	59	100	45
6. Khorsane	0	0	0	9	15	24	9	11	20	16
Percentage	0	0	100	38	62	100	45	55	100	50
7. Shivaratrighat	3	6	9	13	17	30	0	0	0	41
Percentage	33	66	100	43	57	100	0	0	100	42
8. Barnebelayate	1	1	2	10	7	17	2	4	6	74
Percentage	50	50	100	59	41	100	33	66	100	48
9. Tarebhir	10	7	17	48	40	88	0	0	0	31
Percentage	59	41	100	55	45	100	0	0	100	54
10. Salleri	12	14	26	86	73	159	47	47	94	17
Percentage	46	54	100	54.	46	100	50	50	100	57
11. Salghari	9	10	19	17	17	34	16	22	38	23
Percentage	47	53	100	50	50	100	42	48	100	52
12. Arunodaya	1	3	4	0	0	0	0	0	0	60
Percentage	25	75	100	0	0	0	0	0	0	51
13. Rupadhari	0	0	0	39	46	85	6	9	15	12
Percentage	0	0	0	46	54	100	40	60	100	57
14. Chhyangripasini	0	0	0	6	5	11	0	0	0	51
Percentage	0	0	0	(55)	(45)	(100)	0	0	0	(53)
15. Chhabar	13	10	23	60	55	115	0	0	0	15
Percentage	(57)	(43)	(100)	(52)	(48)	(100)	0	0	0	(47)
16. Bancharedanda	40	38	78	52	52	104	0	0	0	64
Percentage	(51)	(49)	(100)	(50)	(50)	(100)	0	0	0	(57)
Grand Total	129	136	265	469	434	903	135	148	2 83	482
Percentage	49	51	100	52	48	100	48	52	100	50.1

Source: Field Survey, 2003

Annex Table 5-B Distribution of Sample Population by Income Groups and Sex

Income Groups

Name of CFUGs	Rich			Medium			
	Male	Female	Total	Male	Female	Total	Male
1. Panchakanya	11	21	32	19	13	32	19

Percentage	34.37	65.63	32.32	59.37	40.63	32.32	54.28
2. Dakshinkali	20	17	37	19	14	33	18
Percentage	54.05	45.95	34.90	57.57	42.43	31.13	50.00
3. Arunganga	29	28	57	34	31	65	39
Percentage	50.87	49.13	29.68	52.30	47.70	33.85	55.71
4. Oiputang	11	20	31	14	21	35	32
Percentage	35.48	16.52	22.46	40	60	25.36	44.44
5. Jalasingha Devi	15	18	33	15	14	29	7
Percentage	45.45	54.55	43.42	51.72	48.28	38.15	50
6. Khorsane	9	17	26	11	12	23	14
Percentage	34.61	65.39	34.21	47.82	52.18	30.26	51.85
7. ShivaRatri Ghat	30	45	75	8	12	20	19
Percentage	40	60	54.74	40	60	14.59	45.23
8. Barne Belayate	10	17	27	56	54	110	17
Percentage	37.03	62.97	15.60	50.90	49.10	63.58	47.22
9. Tarebhir	26	25	51	33	29	62	30
Percentage	50.98	49.02	31.48	53.22	46.78	38.27	61.22
10. Salleri	43	33	76	58	59	117	61
Percentage	56.57	43.43	24.59	49.57	50.43	37.86	52.58
11. Salghari	27	17	44	22	33	55	16
Percentage	61.36	38.64	32.59	40	60	40.74	44.44
12. Arunodaya	30	32	62	17	16	33	14
Percentage	48.38	51.62	51.23	51.51	48.49	27.27	53.84
13. Rupadhari	7	11	18	32	35	67	18
Percentage	38.88	61.12	14.87	47.76	52.24	55.37	50
14. Chhyangripasini	32	33	65	25	17	42	0
Percentage	49.23	50.77	60.74	59.52	40.48	39.25	0
15. Chhabar	14	13	27	40	38	78	34
Percentage	51.85	48.15	15.88	51.28	48.72	45.88	52.30
16. Bancharedanda	46	50	96	56	46	102	54
Percentage	47.91	52.09	32.65	54.90	45.10	34.69	56.25
Grand Total	360	397	757	459	444	903	392
Percentage	47.55	52.45	31.33	50.83	49.17	37.37	51.85

Source: Field Survey, 2003

Annex Table 5-C Educational Status of Sample Population by Illiteracy, Literacy, Level of Educational Attainment and Sex in the 16 CFUG of the Study Area

Level of Educational Attainment

Name of CFUGs	Illiterate			Literate			Primary			Secondary			Higher secondary			Graduate		
	M	F	Tot	M	F	Tot	M	F	Tot	M	F	Tot	M	F	Tot	M	F	T
1 Panchakanya	9	19	28	9	6	15	8	11	19	15	8	23		3	3	1		1
2 Dakshinkali	4	19	23	14	4	18	16	13	29	12	6	18	2	1	3	1		1
3 Arunganga	19	33	52	27	22	49	20	16	36	20	9	29	1	2	3	2		2
4 Oiputang	12	36	48	13	5	18	13	20	33	11	13	24	1		1	0	0	0
5 Jalasinghadevi	6	11	17	13	4	17	6	11	17	7	6	13	2	2	4	0	2	2
6 Khorsane	11	14	25	6	3	9	8	5	13	3	16	19	2		2	0	0	0

7 Shivaratrighat	22	32	54	14	11	25	2	8	10	10	21	31	2	2	4	4		4
8 Barnebelayate	3	34	37	27	16	43	11	9	20	24	17	41	6	0	6	0	0	0
9 Tarebhir	11	28	39	33	16	49	23	15	38	13	9	22	5		5	1	0	1
10.Salleri	18	58	76	46	28	74	35	26	61	41	17	58	3	2	5	0	0	0
11 Salghari	13	24	37	15	12	27	12	15	27	16	7	23	3	3	6	0	0	
12 Arunodaya	5	19	24	16	12	28	7	7	14	19	11	30	6	0	6	2	0	2
13.Rupadhari	8	17	25	12	7	19	11	22	33	17	12	29	2	1	3	1		1
14 Chhyangripasini	2	12	14	7	6	13	11	8	19	22	15	37	5	2	7	6	2	8
15 Chhabar	7	20	27	21	18	39	18	21	39	28	17	45	2	0	2	0	0	0
16 Bancharedanda	22	42	64	37	26	63	30	33	63	37	21	58	7	0	7	3	0	3
Grand Total	172	418	590	310	196	506	231	240	471	295	205	500	49	18	67	21	4	2
Percentage	29	71	100	61	39	100	49	51	100	59	41	100	73	27	100	84	16	10

Source: Field Survey, 2003

Annex Table 5-D Total and Per Household Land Holding by Caste/Ethnic Groups

Caste/Ethnic

COMM	Dalit		Janajati		Newar		
	Total Land (Hec)	Land Per HH (Hec)	Total Land (Hec)	Land Per HH (Hec)	Total Land (Hec)	Land Per HH (Hec)	Total (He
Panchakanya	4.5	1.13	2.5	0.62	6.6	0.83	6.
Dakshinkali	0	0.00	12.8	1.16	6.0	1.98	4.
Arunganga	2.0	0.67	8.3	0.92	4.5	0.90	20
Oiputang	6.2	0.88	16.5	1.18	0	0.00	4.
Jalasinghadevi	0	0.00	2.0	0.49	3.6	1.18	13
Khorsane	0	0.00	2.9	0.73	1.4	0.47	7.
Shivaratrighat	0.2	0.10	8.6	1.08	0	0.00	30
Barnebelayate	0.6	0.60	0.5	0.50	0.6	0.55	21
Tarebhir	3.8	1.27	14.5	0.90	0	0.00	15
Salleri	7.3	1.46	22.3	0.86	17.9	1.49	8.
Salghari	2.0	0.65	11.5	2.29	5.3	1.06	7.
Arunodaya	0.8	0.75	0	0.00	0	0.00	36
Rupadhari	0	0.00	11.5	0.82	1.9	0.95	5.

Chhyangripasini	0	0.00	8.0	4.00	0	0.00	35
Chhabar	3.2	1.07	29.0	1.38	0	0.00	10
Bancharedanda	8.9	0.81	22.5	1.33	0	0.00	23
Grand Total	39.4	0.92	173.1	1.11	47.7	1.14	249

Source: Field Survey, 2003

Annex Table 5-E Total and Per Household Land Holding by Income Groups

Income Groups

CFUGs	Rich		Medium		Poor		
	Total Land (Hec)	Land Per HH (Hec)	Total Land (Hec)	Land Per HH (Hec)	Total Land (Hec)	Land Per HH (Hec)	Total Land (Hec)
Panchakanya	13.2	2.19	5.1	0.85	1.3	0.19	19.54
Dakshinkali	11.3	2.27	6.2	1.54	5.3	0.66	22.75
Arunganga	19.9	1.99	9.3	1.03	5.5	0.46	34.70
Oiputang	12.5	2.50	8.5	1.21	5.9	0.49	26.84
Jalasinghadevi	13.5	1.93	3.6	0.72	1.5	0.48	18.56
Khorsane	6.9	1.73	3.0	0.74	2.0	0.39	11.80
Shivaratrighat	29.9	2.30	5.6	1.39	3.5	0.32	38.98
Barnebelayate	6.5	2.15	14.9	0.87	1.9	0.32	23.23
Tarebhir	20.7	2.59	8.2	0.82	5.1	0.43	34.01
Salleri	23.8	2.64	20.5	1.20	12.0	0.52	56.20
Salghari	11.5	2.29	9.3	1.16	5.2	0.87	25.90
Arunodaya	26.8	3.35	7.7	1.28	2.5	0.50	37.03
Rupadhari	5.4	1.78	10.2	1.02	2.8	0.46	18.33
Chhyangripasini	27.6	3.45	16.1	2.30	0	0.00	43.70
Chhabar	13.4	3.35	21.4	1.65	7.8	0.65	42.60
Bancharedanda	30.4	2.34	17.7	1.10	7.1	0.42	55.13
Grand Total	273.1	2.46	167.0	1.17	69.2	0.48	509.28

Source: Field Survey, 2003

Annex Table 5-F Livestock holding Per Household by Caste/Ethnic Groups

CFUGs	Dalit	Janajati	Newar	Brah/Chh	Average
Panchakanya	5.3	8.5	11.1	33.0	12.8
Dakshinkali	0.0	25.5	5.6	13.0	9.8
Arunganga	3.8	31.8	5.0	111.3	27.2
Oiputang	14.8	31.8	0.0	11.7	11.6
Jalasinghadevi	0.0	13.5	2.8	49.7	11.8
Khorsane	0.0	11.0	4.1	20.3	7.3
Shivaratrighat	1.0	10.5	0.0	58.7	11.7
Barnebelayate	1.3	0.0	0.0	90.3	14.5
Tarebhir	11.3	60.8	0.0	51.3	23.3
Salleri	18.0	57.0	18.3	25.0	27.4
Salghari	11.3	17.0	8.5	37.7	15.5
Arunodaya	1.5	0.0	0.0	122.0	19.6
Rupadhari	0.0	49.8	6.3	12.3	15.1
Chhyangripasini	0.0	8.5	0.0	57.3	10.8
Chhabar	5.5	48.5	0.0	30.3	16.2
Bancharedanda	19.0	69.5	0.0	88.7	32.6
Total Average	8.6	11.4	11.7	15.4	12.7

Source: Field Survey, 2003

Annex Table 5-G Livestock holding per Household by Income Groups

CFUGs	Rich	Medium	Poor	Average
Panchakanya	14.6	3.3	2.7	5.7
Dakshinkali	6.4	3.3	4.1	4.3
Arunganga	28.3	8.9	5.5	12.0
Oiputang	6.3	5.0	4.6	5.1
Jalasinghadevi	8.7	4.1	4.3	5.2
Khorsane	5.0	3.3	2.2	3.2
Shivaratrighat	13.9	2.8	2.3	5.2
Barnebelayate	7.0	11.3	2.1	6.4
Tarebhir	17.8	11.2	5.3	10.3
Salleri	16.5	13.3	8.7	12.1
Salghari	10.7	8.4	3.4	6.8
Arunodaya	26.1	4.1	2.7	8.7
Rupadhari	4.3	12.9	2.7	6.7
Chhyangripasini	12.5	5.4	0.0	4.8
Chhabar	7.4	8.4	5.9	7.1
Bancharedanda	26.6	15.1	7.1	14.4
Total Average	19.1	12.7	7.9	12.7

Source: Field Survey, 2003

Annex Table 5-H Degree of Food Sufficiency Households by CFUG

Degree of Food Sufficiency

CFUGs	Sufficient		Deficit		Surplus		Total	
	HHs	%	HHs	%	HHs	%	HHs	%
Panchakanya	1	5.3	16	84.2	2	10.5	19	100
Dakshinkali	6	35.3	11	64.7	0	0.0	17	100
Arunganga	3	9.7	22	71.0	6	19.4	31	100
Oiputang	3	12.5	17	70.8	4	16.7	24	100
Jalasinghadevi	4	26.7	9	60.0	2	13.3	15	100
Khorsane	4	30.8	6	46.2	3	23.1	13	100
Shivaratrighat	5	17.9	12	42.9	11	39.3	28	100
Barnebelayate	8	30.8	14	53.8	4	15.4	26	100
Tarebhir	7	23.3	19	63.3	4	13.3	30	100
Salleri	19	38.8	25	51.0	5	10.2	49	100
Salghari	8	42.1	8	42.1	3	15.8	19	100
Arunodaya	4	21.1	8	42.1	7	36.8	19	100
Rupadhari	8	42.1	7	36.8	4	21.1	19	100
Chhyangripasini	3	20.0	0	0.0	12	80.0	15	100
Chhabar	7	24.1	17	58.6	5	17.2	29	100
Bancharedanda	16	34.8	23	50.0	7	15.2	46	100
Grand Total	106	26.6	214	53.6	79	19.8	399	100

Source: Field Survey, 2003

Annex Table 5-I Food Deficit Households by Month and CFUG

FUGs	Less than 3 Month		3-6 Month		6-9 Month		12 Month		Total	
	HHs	%	HHs	%	HHs	%	HHs	%	HHs	%
Panchakanya	3	13.0	6	26.1	2	8.7	12	52.2	23	100.0
Dakshinkali	3	25.0	7	58.3	2	16.7	0	0.0	12	100.0
Arunganga	3	27.3	3	27.3	3	27.3	2	18.2	11	100.0
Oiputang	3	20.0	7	46.7	5	33.3	0	0.0	15	100.0
Jalasinghadevi	3	30.0	6	60.0	1	10.0	0	0.0	10	100.0
Khorsane	3	42.9	2	28.6	2	28.6	0	0.0	7	100.0
Shivaratrighat	3	23.1	7	53.8	3	23.1	0	0.0	13	100.0
Barnebelayate	3	27.3	2	18.2	6	54.5	0	0.0	11	100.0
Tarebhir	3	16.7	10	55.6	5	27.8	0	0.0	18	100.0
Salleri	3	18.8	10	62.5	3	18.8	0	0.0	16	100.0
Salghari	3	42.9	2	28.6	2	28.6	0	0.0	7	100.0
Arunodaya	3	50.0	1	16.7	2	33.3	0	0.0	6	100.0
Rupadhari	3	42.9	3	42.9	1	14.3	0	0.0	7	100.0
Chhyangripasini	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chhabar	11	64.7	5	29.4	1	5.9		0.0	17	100.0
Bancharedanda	8	34.8	7	30.4	5	21.7	3	13.0	23	100.0
Grand Total	86	40.2	78	36.4	43	20.1	7	3.3	214	100.0

Source: Field Survey, 2003

Annex Table 5-J Total Household Non CF Income by Caste/Ethnic Groups

FUG	Dalit	Janajati	Newar	Brahmin/Chhetri	Grand Total
Panchakanya	135150	202100	231900	180100	749250
Dakshinkali	-	363000	127500	56500	547000
Arunganga	51000	144600	32000	573900	801500
Oiputang	145400	382500	-	30500	558400
Jalasinghadevi	-	30800	43100	393500	467400
Khorsane	-	68500	29000	130800	228300
Shivaratrighat	24900	135200	-	422100	582200
Barnebelayate	11800	108000	38000	580000	737800
Tarebhir	91000	624200	-	377500	1092700
Salleri	282500	807300	495300	216100	1801200
Salghari	42500	173400	80800	283300	580000
Arunodaya	8800	-	-	1136700	1145500
Rupadhari	-	615000	152000	116600	883600
Chhyangripasini	-	248500	-	808200	1056700
Chhabar	94000	908200	-	475700	1477900
Bancharedanda	436700	1110900	-	794300	2341900
Average of Total	1323750	5922200	1229600	6575800	15051350

Source: Field Survey, 2003

Annex Table 5-K per Household Non-CF Household Income by Caste/Ethnic Groups

FUG	Dalit		Janajati		Newar		Brahmin/Chhetri		Average
	NRs	%	NRs	%	NRs	%	NRs	%	NRs
Panchakanya	33788	19.5	50525	29.1	28988	16.7	60033	34.6	39434
Dakshinkali	-	-	33000	35.0	42500	45.1	18833	20.0	32176
Arunganga	17000	21.1	16067	20.0	6400	8.0	40993	50.9	25855
Oiputang	20771	35.7	27321	46.9	-	-	10167	17.5	23267
Jalasinghadevi	-	-	7700	10.8	14367	20.2	49188	69.0	31160
Khorsane	-	-	17125	35.2	9667	19.9	21800	44.9	17562
Shivaratrighat	12450	23.6	16900	32.0	-	0.0	23450	44.4	20793
Barnebelayate	11800	6.4	108000	59.0	38000	20.8	25217	13.8	28377
Tarebhir	30333	29.3	39013	37.6	-	-	34318	33.1	36423
Salleri	56500	34.3	31050	18.8	41275	25.0	36017	21.8	36759
Salghari	14167	12.6	34680	30.9	16160	14.4	47217	42.1	30526
Arunodaya	8800	12.2	-	-	-		63150	87.8	60289
Rupadhari	-	-	43929	27.7	76000	47.9	38867	24.5	46505
Chhyangripasini	-	-	124250	66.7	-	-	62169	33.3	70447
Chhabar	31333	18.5	43248	25.5	-	-	95140	56.1	50962
Bancharedanda	39700	26.6	65347	43.8	-	-	44128	29.6	50911
Average of Total	30785	22.0	37963	27.2	29276	21.0	41619	29.8	37723

Source: Field Survey, 2003

Annex Table 5-L Total Household Non-CF Income By Income Groups

COMM	Rich	Middle	Poor	Grand Total
Panchakanya	272300	369800	107150	749250
Dakshinkali	287000	120000	140000	547000
Arunganga	509100	170500	121900	801500
Oiputang	73300	339300	145800	558400
Jalasinghadevi	400800	51600	15000	467400
Khorsane	107500	71000	49800	228300
Shivaratrighat	357000	63500	161700	582200
Barnebelayate	108200	436400	193200	737800
Tarebhir	411500	414900	266300	1092700
Salleri	664200	623300	513700	1801200
Salghari	300000	233300	46700	580000
Arunodaya	935700	114000	95800	1145500
Rupadhari	216600	572000	95000	883600
Chhyangripasini	680700	376000	-	1056700
Chhabar	298000	1016700	163200	1477900
Bancharedanda	971500	908500	461900	2341900
Average of Total	6593400	5880800	2577150	15051350

Source: Field Survey, 2003

Annex Table 5-M per Household Non-CF Household Income by Income Groups

FUGs	Rich		Middle		Poor		Average
	NRs	Percent	NRs	Percent	NRs	Percent	NRs
Panchakanya	45383	37.1	61633	50.4	15307	12.5	39434
Dakshinkali	57400	54.7	30000	28.6	17500	16.7	32176
Arunganga	50910	63.6	18944	23.7	10158	12.7	25855
Oiputang	14660	19.5	48471	64.4	12150	16.1	23267
Jalasinghadevi	57257	78.9	10320	14.2	5000	6.9	31160
Khorsane	26875	49.2	17750	32.5	9960	18.2	17562
Shivaratrighat	27462	47.3	15875	27.4	14700	25.3	20793
Barnebelayate	36067	38.4	25671	27.3	32200	34.3	28377
Tarebhir	51438	44.7	41490	36.0	22192	19.3	36423
Salleri	73800	55.6	36665	27.6	22335	16.8	36759
Salghari	60000	61.9	29163	30.1	7783	8.0	30526
Arunodaya	116963	75.4	19000	12.2	19160	12.4	60289
Rupadhari	72200	49.7	57200	39.4	15833	10.9	46505
Chhyangripasini	85088	61.3	53714	38.7	-	-	70447
Chhabar	74500	44.8	78208	47.0	13600	8.2	50962
Bancharedanda	74731	47.1	56781	35.8	27171	17.1	50911
Average of Total	59400	50.2	41124	34.8	17773	15.0	37723

Source: Field Survey, 2003

Annex Table 6 – A Numbers of Dalit Representation in FUC by Sex, Designation and FUGs

Designation by Sex

CFUG	Chairman		Vice-Chairman		Secretary		Joint Secretary		Treasurer		Members		Total		Total Male & Female
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1. Panchakanya	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2
2. Dakshinkali	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Arunganga	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4. Oiputang	0	0	0	0	0	0	0	0	0	0	2	1	2	1	3
5. Jalasinghadevi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Khorsane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Shivaratrighat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Barnebelayate	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1
9. Tarebhir	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2
10. Salleri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11. Salghari	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
12. Arunodaya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13. Rupadhari	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14. Chhyangripasini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. Chhabar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Bancharedanda	0	0	0	0	0	0	0	0	0	0	3	0	3	0	3
Grand Total	0	0	0	0	0	0	0	0	0	0	8	5	8	5	13

Source: Field Survey, 2003

Annex Table 6 –B Numbers of Janajati Representation in FUC by Sex, Designation and CFUGs

Designation by Sex

CFUG	Chairman		Vice-Chairman		Secretary		Joint Secretary		Treasurer		Members		Total		Total Male & Female
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1. Panchakanya	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
2. Dakshinkali	1	0	0	0	1	0	1	0	1	0	1	1	5	1	6
3. Arunganga	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1
4. Oiputang	1	0	0	0	1	0	0	0	1	0	2	0	6	0	6
5. Jalasinghadevi	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1
6. Khorsane	0	0	1	0	1	0	0	0	0	0	0	1	1	2	3
7. Shivaratrighat	0	0	0	0	0	0	0	0	0	0	2	1	2	1	3
8. Barnebelayate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Tarebhir	1	0	0	0	0	0	1	0	1	0	2	0	6	0	6
10. Salleri	1	0	0	0	0	0	0	0	1	0	2	2	4	2	6
11. Salghari	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2
12. Arunodaya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13. Rupadhari	1	0	0	0	1	0	0	0	1	0	5	1	9	1	10
14. Chhyangripasini	0	0	0	0	0	0	0	0	0	0	1	1	2	1	3
15. Chhabar	1	0	0	0	1	0	1	0	0	0	2	1	6	1	7
16. Bancharedanda	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2
Grand Total	7	0	1	0	5	0	3	1	6	0	19	10	45	12	57

Source: Field Survey, 2003

Annex Table 6 –C Numbers of Newar Representation in FUC by Sex, Designation and CFUG

Designation by Sex

CFUG	Chairman		Vice-Chairman		Secretary		Joint Secretary		Treasurer		Members		Total		Total Male & Female
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1. Panchakanya	1	0	1	0	0	0	1	0	0	0	0	2	3	2	5
2. Dakshinkali	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2
3. Arunganga	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
4. Oiputang	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Jalasinghadevi	0	0	0	0	1	0	0	0	1	0	0	1	2	1	3
6. Khorsane	0	0	0	0	0	0	0	0	0	0	1	2	1	2	3
7. Shivaratrighat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Barnebelayate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Tarebhir	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10. Salleri	0	0	0	0	1	0	0	0	0	0	1	0	2	0	2
11. Salghari	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1
12. Arunodaya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13..Rupadhari	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14. Chhyangripasini	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15. Chhabar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16. Bancharedanda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	1	0	2	0	1	0	2	0	5	5	12	5	17

Source: Field Survey, 2003

Annex Table 6–D Numbers of Brahmin/Chhetri Representation in FUC by Sex, Designation and CFUG

Designation by Sex

CFUG	Chairman		Vice-Chairman		Secretary		Joint Secretary		Treasurer		Members		Total		Total Male & Female	grand Total
	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
1 Panchakanya	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	9
2 Dakshinkali	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	9
3 Arunganga	1	0	0	0	1	0	0	0	0	0	5	0	7	0	7	10
4 Oiputang	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	10
5 Jalasinghadevi	1	0	1	0	0	0	1	0	0	0	1	1	4	1	5	9
6 Khorsane	1	0	0	0	0	0	1	0	1	0	0	0	3	0	3	9
7 Shivaratrighat	1	0	1	0	1	0	0	0	1	0	3	1	7	1	8	11
8 Barnebelayate	1	0	1	0	1	0	1	0	1	0	4	0	9	0	9	10
9 Tarebhir	0	0	0	0	1	0	0	0	0	0	0	1	1	1	2	10
10.Salleri	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	9
11 Salghari	0	0	1	0	1	0	0	0	1	0	2	0	5	0	5	9
12 Arunodaya	1	0	1	0	1	0	1	0	1	0	5	1	10	1	11	11
13.Rupadhari	0	0	0	0	0	0	0	0		0	1	0	1	0	1	11
14 Chhyangripasini	1	0	0	0	1	0	1	0	1	0	1	1	5	1	6	9
15 Chhabar	0	0	0	0	0	0	0	0	1	0	0	1	1	1	2	9
16 Bancharedanda	1	0	1	0	1	0	1	0	1	0	2	0	7	0	7	12
Grand Total	8	0	8	0	9	0	6	0	8	0	24	7	63	7	70	157

Source: Field Survey, 2003

Annex Table 6-E User's Fee Rates of Sal Timber Distribution by Type and CFUG

(In NRs/N)

CFUG	Garalo	Haris	Juwa	Nidal	Plough	Pool	Saw/QF	Valsi	Tham
Panchakanya	15	15	0	30	5	20	80	15	15
Dakshinkali	15	15	0	25	5	15	50	15	15
Arunganga	10	20	0	10	5	10	Restricted	10	10
Oiputang	10	15	0	10	5	10	Restricted	10	10
Jalasinghadevi	15	15	0	30	5	20	200	15	15
Khorsane	10	5	5	10	5	10	Restricted	10	10
Shivaratrighat	10	20	10	40	5	20	200	10	15
Barnebelayate	50	25	0	200	5	100	200	50	50
Tarebhir	15	15	0	30	5	20	80	15	15
Salleri	10	15	0	25	5	15	50	10	10
Salghari	20	0	0	40	0	40	200	20	20
Arunodaya	15	15	0	30	5	20	50	15	15
Rupadhari	10	10	0	10	0	10	50	10	10
Chhyangripasini	10	10	0	20	5	20	60	10	10
Chhabar	50	15	0	100	10	100	Restricted	50	50
Bancharedanda	15	15	0	20	5	20	25	15	15

Source: Field Survey, 2003

Annex Table 6-F Collection Time of Sal Timber by Type and CFUG

Types of Sal Timber

CFUG	Garalo	Haris	Juwa	Nidal	Plough	Pool	Saw	Valsi	Tham
Panchakanya	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Dakshinkali	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Arunganga	Any time	Any time	Any time	Any time	Any time	Any time	**Restricted**	Any time	Any time
Oiputang	Any time	Any time	Any time	Any time	Any time	Any time	**Restricted**	Any time	Any time
Jalasinghadevi	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Khorsane	Any time	Any time	Any time	Any time	Any time	Any time	Restricted	Any time	Any time
Shivaratrighat	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Barnebelayate	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Tarebhir	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Salleri	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Salghari	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Arunodaya	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Rupadhari	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Chhyangripasini	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time
Chhabar	Any time	Any time	Any time	Any time	Any time	Any time	**Restricted**	Any time	Any time
Bancharedanda	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time	Any time

Source: Field Survey, 2003.

Annex Table 6-G Rates of Auction Sale of Sal Timber by Type and CFUG
(In NRS/N)

Types of Sal Timber

CFUG	Garalo	Haris	Juwa	Nidal	Plough	Pool	Saw/QF	Valsi	Tham
Panchakanya	50	Not	Not	100	Not	100	Not	50	50
Dakshinkali	50	Not	Not	100	Not	100	Not	50	50
Arunganga	50	Not	Not	100	Not	100	Not	50	50
Oiputang	50	Not	Not	75	Not	75	Not	50	50
Jalasinghadevi	50	Not	Not	100	Not	100	Not	50	50
Khorsane	70	Not	Not	70	Not	70	Not	70	70
Shivaratrighat	50	Not	Not	100	Not	100	Not	50	50
Barnebelayate	Not	Not	Not	Not	Not	Not	Not	Not	Not
Tarebhir	50	Not	Not	100	Not	100	Not	50	50
Salleri	50	Not	Not	100	Not	100	Not	50	50
Salghari	Not	Not	Not	Not	Not	Not	Not	Not	Not
Arunodaya	50	Not	Not	100	Not	100	Not	50	50
Rupadhari	50	Not	Not	70	Not	70	Not	50	50
Chhyangripasini	50	Not	Not	70	Not	70	Not	50	50
Chhabar	Not	Not	Not	Not	Not	Not	Not	Not	Not
Bancharedanda	75	Not	Not	100	Not	100	150	75	75

Source: Field Survey, 2003

Annex Table 6-H User's Rates of Non- Sal Timber Distribution by Type and CFUG
(In NRs/N)

Types of Non-Sal Timber

CFUG	Garalo	Nidal	Pool	Saw/QF	Teka	Thangra	Valsi
Panchakanya	Free	Free	Free	16	Free	Free	Free
Dakshinkali	Free	Free	Free	16	Free	Free	Free
Arunganga	Free	Free	Free	25	Free	Free	Free
Oiputang	Free	Free	Free	12	Free	Free	Free
Jalasinghadevi	Free	Free	Free	30	Free	Free	Free
Khorsane	Free	Free	Free	20	Free	Free	Free
Shivaratrighat	Free	Free	Free	20	Free	Free	Free
Barnebelayate	Free	Free	Free	10	Free	Free	Free
Tarebhir	Free	Free	Free	14	Free	Free	Free
Salleri	Free	Free	Free	10	Free	Free	Free
Salghari	Free	Free	Free	40	Free	Free	Free
Arunodaya	Free	Free	Free	50	Free	Free	Free
Rupadhari	Free	Free	Free	5	Free	Free	Free
Chhyangripasini	Free	Free	Free	12	Free	Free	Free
Chhabar	Free	Free	Free	25	Free	Free	Free
Bancharedanda	Free	Free	Free	20	Free	Free	Free

Source: Field Survey, 2003

Annex Table 6-I Collection Time of Non- Sal Timber by Type and CFUG

Types of Non Sal Timber

CFUG	Garalo	Nidal	Pool	Saw	Teka	Thangra	Valsi
Panchakanya	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Dakshinkali	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Arunganga	When need	When need	When need	When need	When need	Baisakh-Ashad	When need
Oiputang	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Jalasinghadevi	When need	When need	When need	When need	When need	Baisakh-Ashad	When need
Khorsane	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Shivaratrighat	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Barnebelayate	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Tarebhir	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Salleri	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Salghari	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Arunodaya	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Rupadhari	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Chhyangripasini	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Chhabar	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need
Bancharedanda	When need	When need	When need	When need	Mansir	Baisakh-Ashad	When need

Source: Field Survey, 2003

Annex Table 6-J User's Rates of Firewood Distribution by Type and CFUG

(In NRs/20 head load)

Types of Firewood

CFUG	Drywood	Greenwood	Jhikra	Tree branch
Panchakanya	Free	Free	Free	Free
Dakshinkali	Free	5	Free	Free
Arunganga	Free	0.25	Free	Free
Oiputang	Free	5	Free	Free
Jalasinghadevi	Free	Free	Free	Free
Khorsane	Free	7	Free	Free
Shivaratrighat	Free	1	Free	Free
Barnebelayate	Free	5	Free	Free
Tarebhir	Free	Free	Free	Free
Salleri	Free	Free	Free	Free
Salghari	Free	Free	Free	Free
Arunodaya	Free	6	Free	Free
Rupadhari	Free	5	Free	Free
Chhyangripasini	Free	Free	Free	Free
Chhabar	Free	5	Free	Free
Bancharedanda	Free	Free	Free	Free

Source: Field Survey, 2003

Annex Table 6-K Collection Time of Firewood by Type and CFUG

Types of Firewood

CFUG	Drywood	Greenwood	Jhikra	Tree branch
Panchakanya	When need	Falgun/chaitra	When need	Falgun/chaitra
Dakshinkali	When need	Falgun/chaitra	When need	Falgun/chaitra
Arunganga	When need	**Magh-Falgun**	When need	Falgun/chaitra
Oiputang	When need	Falgun/chaitra	When need	Falgun/chaitra
Jalasinghadevi	When need	Falgun/chaitra	When need	Falgun/chaitra
Khorsane	When need	Falgun/chaitra	When need	Falgun/chaitra
Shivaratrighat	When need	Falgun/chaitra	When need	Falgun/chaitra
Barnebelayate	When need	Falgun/chaitra	When need	Falgun/chaitra
Tarebhir	When need	Falgun/chaitra	When need	Falgun/chaitra
Salleri	When need	Falgun/chaitra	When need	Falgun/chaitra
Salghari	When need	Falgun/chaitra	When need	Falgun/chaitra
Arunodaya	When need	Falgun/chaitra	When need	Falgun/chaitra
Rupadhari	When need	Falgun/chaitra	When need	Falgun/chaitra
Chhyangripasini	When need	Falgun/chaitra	When need	Falgun/chaitra
Chhabar	When need	Falgun/chaitra	When need	Falgun/chaitra
Bancharedanda	When need	Falgun/chaitra	When need	Falgun/chaitra

Source: Field Survey, 2003

Annex Table 6-L User's Rates of Green Grass Distribution by Type and CFUG (In NRs/head load)

Types of Green Grass

CFUG	Cutgrass	Tree fodder
Panchakanya	Free	Free
Dakshinkali	Free	Free
Arunganga	Free	Free
Oiputang	Free	Free
Jalasinghadevi	Free	Free
Khorsane	Free	Free
Shivaratrighat	Free	Free
Barnebelayate	Free	Free
Tarebhir	Free	Free
Salleri	Free	Free
Salghari	Free	Free
Arunodaya	Free	Free
Rupadhari	Free	Free
Chhyangripasini	Free	Free
Chhabar	Free	Free
Bancharedanda	Free	Free

Source: Field Survey, 2003

Annex Table 6-M Collection Time of Green Grass by Type and CFUG

Types of Green Grass

CFUG	Cutgrass	Tree fodder
Panchakanya	Ashad-Marg	When need
Dakshinkali	Ashad-Marg	When need
Arunganga	Ashad-Marg	When need
Oiputang	Ashad-Marg	When need
Jalasinghadevi	Ashad-Marg	When need
Khorsane	Ashad-Marg	When need
Shivaratrighat	Ashad-Marg	When need
Barnebelayate	Ashad-Marg	When need
Tarebhir	Ashad-Marg	When need
Salleri	Ashad-Marg	When need
Salghari	Ashad-Marg	When need
Arunodaya	Ashad-Marg	When need
Rupadhari	Ashad-Marg	When need
Chhyangripasini	Ashad-Marg	When need
Chhabar	Ashad-Marg	When need
Bancharedanda	Ashad-Marg	When need

Source: Field Survey, 2003

Annex Table 6-N User's Rates of Leaf Liter Distribution by Type and CFUG (In NRs/head load)

Types of Leaf Liter

CFUG	Babio	Dry leaf	Green leaf	Khar
Panchakanya	0	Free	Free	5
Dakshinkali	0	Free	Free	5
Arunganga	0	Free	Free	5
Oiputang	0	Free	Free	5
Jalasinghadevi	0	Free	Free	5
Khorsane	0	Free	Free	40
Shivaratrighat	0	Free	Free	20
Barnebelayate	5	Free	Free	5
Tarebhir	0	Free	Free	15
Salleri	0	Free	Free	20
Salghari	0	Free	Free	0
Arunodaya	0	Free	Free	6
Rupadhari	0	Free	Free	15
Chhyangripasini	0	Free	Free	15
Chhabar	0	Free	Free	5
Bancharedanda	0	Free	Free	5

Source: Field Survey, 2003

Annex Table 6-O Collection Time of Leaf Liter by Type and CFUG

Types of Leaf Liter

CFUG	Babio	Dryleaf	Greenleaf	Khar
Panchakanya		When need	Jest-Aswin	Mansir
Dakshinkali		When need	Jest-Aswin	Mansir
Arunganga		When need	Jest-Aswin	Mansir
Oiputang		When need	Jest-Aswin	Mansir
Jalasinghadevi		When need	Jest-Aswin	Mansir
Khorsane		When need	Jest-Aswin	Mansir
Shivaratrighat		When need	Jest-Aswin	Mansir
Barnebelayate	Mansir	When need	Jest-Aswin	Mansir
Tarebhir		When need	Jest-Aswin	Mansir
Salleri		When need	Jest-Aswin	Mansir
Salghari		Jest-Aswin	Jest-Aswin	PoushMagh
Arunodaya		When need	Jest-Aswin	Mansir
Rupadhari		When need	Jest-Aswin	Mansir
Chhyangripasini		When need	Jest-Aswin	Mansir
Chhabar		When need	Jest-Aswin	Mansir
Bancharedanda		When need	Jest-Aswin	Mansir

Source: Field Survey, 2003

Annex Table 6-P User's Rates of Fruits Distribution by Type and CFUG (In NRs/k.g)

Types of Fruit

CFUG	Bayar	Bel	Bhalayo	Jamun/Fadir	Kattus	Sarifa	Satibayar	Trifala
Panchakanya	Free	Free	Free	Free	-	-	Free	Free
Dakshinkali	Free	Free	Free	Free	-	-	Free	Free
Arunganga	Free	Free	Free	Free	-	-	Free	Free
Oiputang	Free	Free	Free	Free	-	-	Free	Free
Jalasinghadevi	Free	-	-	Free	-	Free	Free	Free
Khorsane	Free	-	Free	Free	-	-	Free	Free
Shivaratrighat	Free	Free	Free	Free	-	Free	Free	Free
Barnebelayate	Free	Free	Free	Free	-	Free	Free	Free
Tarebhir	-	-	-	-	-	Free	-	Free
Salleri	Free	-	-	Free	-	-	Free	Free
Salghari	-	Free	Free	Free	-	-	Free	Free
Arunodaya	Free	Free	Free	Free	-	-	Free	Free
Rupadhari	Free	-	Free	Free	--	-	Free	Free
Chhyangripasini	Free	-	Free	Free	Free	-	Free	Free
Chhabar	Free	-	Free	Free	-	-	Free	Free
Bancharedanda	-	-	Free	Free	Free	Free	-	Free

Source: Field Survey, 2003.

Annex Table 6-Q Collection Time of Fruits by Type and CFUG

Types of Fruit

CFUG	Bayar	Bel	Bhalayo	Jamun/fadir	Kattus	Sarifa
Panchakanya	Kartic-Mansir	Jest	Jest-Bhadra	Ashad-srawan	-	-
Dakshinkali	Kartic-Mansir	Jest	Jest-Bhadra	Ashad-srawan	-	-
Arunganga	Kartic-Mansir	Jest	Jest-Bhadra	Ashad-srawan	-	-
Oiputang	Kartic-Mansir	-	Jest-Bhadra	Ashad-srawan	-	-
Jalasinghadevi	Kartic-Mansir	-	-	Ashad-srawan	-	Mansi
Khorsane	Kartic-Mansir	-	Jest-Bhadra	Ashad-srawan	-	-
Shivaratrighat	Kartic-Mansir	Jest	Jest-Bhadra	Ashad-srawan	-	Kartic-M
Barnebelayate	Kartic-Mansir	Jest	Jest-Bhadra	Ashad-srawan	-	Kartic-M
Tarebhir		-	-		-	Kartic-M
Salleri	Kartic-Mansir	Jest	-	Ashad-srawan	-	-
Salghari	-	Jest	Jest-Bhadra	Ashad-srawan	-	-
Arunodaya	Kartic-Mansir	Jest	Jest-Bhadra	Ashad-srawan	-	-
Rupadhari	Kartic-Mansir	-	Jest-Bhadra	Ashad-srawan	-	-
Chhyangripasini	Kartic-Mansir	-	Jest-Bhadra	Ashad-srawan	Jest-Bhadra	-
Chhabar	Kartic-Mansir	-	Jest-Bhadra	Ashad-srawan	-	-
Bancharedanda	-	-	Jest-Bhadra	Ashad-srawan	Jest-Bhadra	Kartic-M

Source: Field Survey, 2003

Annex Table 6-R Income Sources of FUGs by Type

Sources of Income by Type and FUG

CFUG	Government Grant	VDC Support	Sale of Forest Product	Application Fees	Interest	Punis F
Panchakanya	0	1500	6300	1200	8245	8
Dakshinkali	2000	0	4000	900	0	5
Arunganga	5000	0	7000	1135	0	
Oiputang	0	0	550	600	2000	
Jalasinghadevi	15000	0	1200	700	8150	5
Khorsane	5000	0	1126	65	1310	3
Shivaratrighat	0	0	4500	150.5	0	
Barnebelayate	0	0	7500	200	0	
Tarebhir	3000	0	214	36	250	1
Salleri	7000	0	8500	1300	6500	7
Salghari	10500	0	1160	400	0	3
Arunodaya	5000	0	1600	350	0	1
Rupadhari	0	0	0	0	0	
Chhyangripasini	0	0	0	0	0	
Chhabar	0	0	3400	350	701	5
Bancharedanda	0	0	25000	1000	5500	1
Grand Total	52500	1500	72050	8386.5	32656	5
Average Income	3281.25	93.75	4503.125	524.1563	2041	373

Source: Field Survey, 2003

Annex Table 6-S Investment and Expenditure Patterns of CFUG

CFUG	Lending	Office Expense	School	Drinking water	Pati Maintenance	Nursery	Fair
Panchakanya	11500	260	3000	0	10000	0	
Dakshinkali	0	1100	5000	0	0	2000	5
Arunganga	0	2860	0	0	0	0	
Oiputang	3618	500	0	0	0	0	
Jalasinghadevi	26640	150	1500	0	0	0	
Khorsane	6000	111	0	6000	0	0	
Shivaratrighat	0	200	0	0	0	0	
Barnebelayate	0	300	0	0	0	0	
Tarebhir	3000	600	0	0	0	0	
Salleri	25675	3000	500	0	0	0	
Salghari	0	520	1500	0	0	0	
Arunodaya	0	550	2000	0	0	0	
Rupadhari	0	0	0	0	0	0	
Chhyangripasini	0	0	0	0	0	0	
Chhabar	2400	173	0	0	0	0	
Bancharedanda	14000	3000	0	0	0	0	
Grand Total	92833	13324	13500	6000	10000	2000	5
Percentage	41.3	5.9	6.0	2.7	4.4	0.9	

Source: Field Survey, 2003

*Purchase of Forestry instruments

Annex Table 7-A Quantification of Forest Products Benefits from Community Forest in terms of Per Household Gross Monetary Value /Income by Type and CFUG (Values in Nepalese Rs.)

Type of Forest Products

CFUG	N	Fire Wood		Fodder		Green Grass		Green Leaf		Dry Leaf		Timber		Plough		
		Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	
Panchakanya	19	1882	32.3	891	15.3	568	9.8	556	9.6	1028	17.7	395	6.8	121	2.1	3
Dakshinkali	17	1882	40.3	569	12.2	488	10.5	350	7.5	768	16.4	185	4.0	124	2.6	3
Arunganga	31	1916	33.4	967	16.9	594	10.4	619	10.8	819	14.3	339	5.9	124	2.2	3
Oiputang	24	2852	50.3	665	11.7	542	9.6	548	9.7	604	10.7	13	0.2	106	1.9	3
Jalasinghadevi	15	2096	33.6	762	12.2	540	8.7	789	12.7	966	15.5	500	8.0	113	1.8	4
Khorsane	13	2215	39.9	727	13.1	654	11.8	779	14.0	727	13.1	0	0.0	92	1.7	3
Shivaratrighat	28	1429	31.2	567	12.4	482	10.5	672	14.7	759	16.6	246	5.4	138	3.0	2
Barnebelayate	26	1308	28.3	727	15.8	623	13.5	713	15.5	768	16.7	35	0.8	108	2.3	3
Tarebhir	30	1740	35.7	801	16.4	543	11.1	660	13.5	732	15.0	0	0.0	102	2.1	2
Salleri	49	1592	27.6	732	12.7	543	9.4	567	9.8	579	10.0	1402	24.3	120	2.1	2
Salghari	19	2126	25.4	872	10.4	621	7.4	841	10.1	862	10.3	2589	31.0	132	1.6	3
Arunodaya	19	1516	27.5	1047	19.0	726	13.2	818	14.8	873	15.8	0	0.0	163	3.0	3
Rupadhari	19	2147	38.9	914	16.5	605	11.0	601	10.9	711	12.9	0	0.0	147	2.7	4
Chhyangripasini	15	1813	25.2	702	9.7	900	12.5	1311	18.2	1296	18.0	460	6.4	163	2.3	5
Chhabar	29	2166	39.5	580	10.6	610	11.1	746	13.6	782	14.3	171	3.1	117	2.1	3
Bancharedanda	46	1735	30.0	902	15.6	598	10.3	838	14.5	792	13.7	492	8.5	139	2.4	2
Grand Total	399	1854	32.9	779	13.8	590	10.5	698	12.4	784	13.9	474	8.4	125	2.2	3

Source: Field Survey, 2003.

Annex Table 7-B Total CF Household Income by Caste/Ethnic Group

Number of Households and Caste/Ethnic Groups

COMM	HH Number	Dalit	Janajati	Newar	Brah/Chh	Grand Total
Panchakanya	19	18740	18824	56982	16070	110616
Dakshinkali	17	0	49414	17474	12458	79346
Arunganga	31	14290	47038	23810	92486	177624
Oiputang	24	46190	72742	0	17020	135952
Jalasinghadevi	15	0	31424	18740	43292	93456
Khorsane	13	0	21330	18562	32274	72166
Shivaratrighat	28	3930	28598	0	95506	128034
Barnebelayate	26	7230	2010	4850	105862	119952
Tarebhir	30	15134	69670	0	61456	146260
Salleri	49	25230	153814	74848	28730	282622
Salghari	19	18788	35846	41060	63272	158966
Arunodaya	19	2926		0	101910	104836
Rupadhari	19	0	74406	12180	18390	104976
Chhyangripasini	15	0	12222	0	95928	108150
Chhabar	29	15560	108656	0	34900	159116
Bancharedanda	46	51620	111792	0	102750	266162
Grand Total	399	219638	837786	268506	922304	2248234

Source: Field Survey, 2003

Annex Table 7-C per Household and Average percentage of CF Gross Value/Income by Caste/Ethnic Groups (in Nepalese rupees)

Caste/Ethnic Groups

	Dalit		Janajati		Newar		Brahmin/Chhetri		Average	
	NRs	%	NRs	%	NRs	%	NRs	%	NRs	%
Panchakanya	4685	21	4706	22	7123	33	5357	24	5822	100
Dakshinkali	0	0	4492	31	5825	40	4153	29	4667	100
Arunganga	4763	22	5226	24	4762	22	6606	31	5730	100
Oiputang	6599	38	5196	30	0	0	5673	32	5665	100
Jalasinghadevi	0	0	7856	40	6247	32	5412	28	6230	100
Khorsane	0	0	5333	32	6187	37	5379	32	5551	100
Shivaratrighat	1965	18	3575	33	0	0	5306	49	4573	100
Barnebelayate	7230	39	2010	11	4850	26	4603	25	4614	100
Tarebhir	5045	34	4354	29	0	0	5587	37	4875	100
Salleri	5046	23	5916	27	6237	28	4788	22	5768	100
Salghari	6263	19	7169	22	8212	26	10545	33	8367	100
Arunodaya	2926	34	0	0	0	0	5662	66	5518	100
Rupadhari	0	0	5315	30	6090	35	6130	35	5525	100
Chhyangripasini	0	0	6111	45	0	0	7379	55	7210	100
Chhabar	5187	30	5174	30	0	0	6980	40	5487	100
Bancharedanda	4693	28	6576	39	0	0	5708	34	5786	100
Average	5108	22.5	5370	23.6	6393	28.2	5837	25.7	5635	100

Source: Field Survey, 2003

Annex Table 7-D Total CF Household Income by Income Group

Number of Households and Caste/Ethnic Groups

COMM	HH Number	Rich	Medium	Poor	Grand Total
Panchakanya	19	45578	39844	25194	110616
Dakshinkali	17	34310	24354	20682	79346
Arunganga	31	80534	55090	42000	177624
Oiputang	24	33026	49836	53090	135952
Jalasinghadevi	15	49468	31898	12090	93456
Khorsane	13	30060	23746	18360	72166
Shivaratrighat	28	79446	19658	28930	128034
Barnebelayate	26	18560	87122	14270	119952
Tarebhir	30	57388	59134	29738	146260
Salleri	49	90236	125606	66780	282622
Salghari	19	68440	55480	35046	158966
Arunodaya	19	56396	33830	14610	104836
Rupadhari	19	18610	67330	19036	104976
Chhyangripasini	15	61798	46352		108150
Chhabar	29	29060	87590	42466	159116
Bancharedanda	46	111340	107830	46992	266162
Grand Total	399	864250	914700	469284	2248234

Source: Field Survey, 2003

Annex Table 7-E per Household and Average percentage of Gross Monetary Value/Income by Income Groups (in Nepalese rupees)

Income Groups

	Rich		Medium		Poor		Average	
CFUGs	NRs	%	NRs	%	NRs	%	NRs	%
Panchakanya	7596	43	6641	37	3599	20	5822	100
Dakshinkali	6862	44	6089	39	2585	17	4667	100
Arunganga	8053	46	6121	35	3500	20	5730	100
Oiputang	6605	36	7119	39	4424	24	5665	100
Jalasinghadevi	7067	40	6380	37	4030	23	6230	100
Khorsane	7515	44	5937	35	3672	21	5551	100
Shivaratrighat	6111	45	4915	36	2630	19	4573	100
Barnebelayate	6187	45	5125	37	2378	17	4614	100
Tarebhir	7174	46	5913	38	2478	16	4875	100
Salleri	10026	49	7389	36	2903	14	5768	100
Salghari	13688	52	6935	26	5841	22	8367	100
Arunodaya	7050	45	5638	36	2922	19	5518	100
Rupadhari	6203	39	6733	42	3173	20	5525	100
Chhyangripasini	7725	54	6622	46	0	0	7210	100
Chhabar	7265	41	6738	38	3539	20	5487	100
Bancharedanda	8565	47	6739	37	2764	15	5786	100
Average	7786	45.0	6397	37.0	3236	18.0	5635	100

Source: Field Survey, 2003

Annex table 7-F Per household net CF income by Caste/Ethnic groups (in Nepalese rupees)

Caste/Ethnic Groups

CFUGs	Dalit		Janajati		Newar		Brahmin/Chhetri		Total	
	N	Netincome/ household	N	Netincome/ household	N	Netincome/ household	N	Netincome/ household	N	Total Average
Panchakanya	4	1378	4	1009	8	2723	3	1389	19	1868
Dakshinkali	0	0	11	1190	3	1825	3	366	17	1156
Arunganga	3	1238	9	1388	5	1158	14	1845	31	1543
Oiputang	7	2092	14	1586	0	0	3	1986	24	1784
Jalasinghadevi	0	0	4	2537	3	1464	8	555	15	1265
Khorsane	0	0	4	1413	3	2284	6	1639	13	1718
Shivaratrighat	2	92	8	613	0	0	18	1563	28	1187
Barnebelayate	1	3030	1	-61	1	1914	23	298	26	451
Tarebhir	3	1138	16	948	0	0	11	1523	30	1178
Salleri	5	1295	26	2656	12	1912	6	840	49	2113
Salghari	3	2304	5	3416	5	4228	6	5164	19	4006
Arunodaya	1	-445	0	0	0	0	18	1334	19	1240
Rupadhari	0	0	14	1870	2	1661	3	2245	19	1907
Chhyangripasini	0	0	2	2254	0	0	13	2454	15	2427
Chhabar	3	1553	21	1386	0	0	5	2111	29	1528
Bancharedanda	11	1152	17	1993	0	0	18	1731	46	1689
Grand Total	43	1413	156	1714	42	2229	158	1541	399	1667

Source: Field Survey, 2003

Annex table 7-G Per household net CF income by Income Groups (in Nepalese rupees)

Income Groups

CFUGs	Rich			Medium			Poor			Total	
	N	Net income/ Household		N	Net income/ Household		N	Net income/ Household		N	Total Average
		Rs.	%		Rs.	%		Rs.	%		
Panchakanya	6	2861	49	6	2201	38	7	732	13	19	1868
Dakshinkali	5	2276	53	4	2004	46	8	33	1	17	1156
Arunganga	10	2465	51	9	1759	36	12	612	13	31	1543
Oiputang	5	2570	42	7	2377	39	12	1110	18	24	1784
Jalasinghadevi	7	1494	42	5	1213	34	3	820	23	15	1265
Khorsane	4	3244	59	4	1716	31	5	499	9	13	1718
Shivaratrighat	13	1497	40	4	1503	41	11	705	19	28	1187
Barnebelayate	3	1084	79	17	611	44	6	-316	-23	26	451
Tarebhir	8	2005	52	10	1613	42	12	263	7	30	1178
Salleri	9	4844	59	17	2964	36	23	415	5	49	2113
Salghari	5	7832	59	8	2345	18	6	3032	23	19	4006
Arunodaya	8	1775	53	6	1631	49	5	-86	-3	19	1240
Rupadhari	3	2371	43	10	2485	45	6	713	13	19	1907
Chhyangripasini	8	2915	61	7	1870	39	0	0	0	15	2427
Chhabar	4	2090	43	13	2234	46	12	576	12	29	1528
Bancharedanda	13	3335	61	16	1912	35	17	221	4	46	1689
Grand Total	111	2769	53	143	1928	37	145	567	11	399	1667

Source: Field Survey, 2003

Annex Table 8-A Labour Cost per Household of Community Forest Use by Caste/Ethnic Groups

Caste/Ethnic Groups

CFUGs	Dalit			Janajati %			Newar			Brahmin/Chhetri			Total P/H	
	N	Rs.	%	N	Rs.	%	N	Rs.	%	N	Rs.	%	N	Rs.
Panchakanya	4	1882	21	4	2062	23	8	2838	31	3	2258	25	19	2382
Dakshinkali	0	0	0	11	1777	31	3	2083	36	3	1899	33	17	1853
Arunganga	3	2225	24	9	2283	24	5	1914	21	14	2907	31	31	2500
Oiputang	7	2893	42	14	1909	28	0	0	0	3	2115	31	24	2222
Jalasinghadevi	0	0	0	4	2590	37	3	2266	32	8	2221	31	15	2328
Khorsane	0	0	0	4	2120	30	3	2670	38	6	2312	33	13	2335
Shivaratrighat	2	623	13	8	1687	36	0	0	0	18	2430	51	28	2089
Barnebelayate	1	2900	40	1	721	10	1	1236	17	23	2442	33	26	2347
Tarebhir	3	2086	30	16	2073	30	0	0	0	11	2733	40	30	2317
Salleri	5	2501	25	26	2102	21	12	3106	30	6	2497	24	49	2437
Salghari	3	2475	22	5	2556	23	5	2734	25	6	3263	30	19	2813
Arunodaya	1	1971	40	0	0	0	0	0	0	18	2899	60	19	2850
Rupadhari	0	0	0	14	2353	28	2	2961	36	3	2973	36	19	2515
Chhyangripasini	0	0	0	2	3232	45	0	0	0	13	3998	55	15	3896
Chhabar	3	2522	27	21	2734	30	0	0	0	5	3974	43	29	2926
Bancharedanda	11	2593	29	17	3447	39	0	0	0	18	2862	32	46	3014
Total P/H	43	2392	24	156	2334	23	42	2653	26	158	2786	27	399	2553

Source: Field Survey, 2003

Annex Table 8-B. Labour Cost per Household of Community Forest Use by Income Groups

COMM	Income Groups									Total and Average	
	Rich			Medium			Poor				
	N	Rs.	Percent	N	Rs.	Percent	N	Rs.	Percent	N	Rs.
Panchakanya	6	3119	43	6	2765	38	7	1421	19	19	2382
Dakshinkali	5	2699	43	4	2724	43	8	888	14	17	1853
Arunganga	10	3756	48	9	2730	35	12	1280	16	31	2500
Oiputang	5	2675	37	7	3005	41	12	1576	22	24	2222
Jalasinghadevi	7	2534	39	5	2561	39	3	1460	22	15	2328
Khorsane	4	3016	42	4	2771	38	5	1443	20	13	2335
Shivaratrighat	13	3009	49	4	2124	35	11	988	16	28	2089
Barnebelayate	3	3186	46	17	2678	39	6	989	14	26	2347
Tarebhir	8	3494	47	10	2889	39	12	1055	14	30	2317
Salleri	9	3871	46	17	3164	38	23	1337	16	49	2437
Salghari	5	4183	49	8	3000	35	6	1422	17	19	2813
Arunodaya	8	3734	46	6	2563	32	5	1781	22	19	2850
Rupadhari	3	2937	40	10	3159	43	6	1231	17	19	2515
Chhyangripasini	8	3907	50	7	3883	50	0	0	0	15	3896
Chhabar	4	4180	44	13	3564	37	12	1816	19	29	2926
Bancharedanda	13	3992	43	16	3719	40	17	1603	17	46	3014
Total P/H	111	3458	44	143	3061	39	145	1359	17	399	2553

Source: Field Survey, 2003

Annex Table 8-C Decision Making Cost per Household of CF Management by Caste/Ethnic Groups

CFUG1s	Dalit		Janajati		Newar		Brahmin/Chhetri		Total P/H
	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.
Panchakanya	100	18	109	19	154	27	207	36	141
Dakshinkali	0	0	205	37	167	30	186	33	195
Arunganga	150	23	111	17	160	25	219	34	172
Oiputang	167	27	211	34	0	0	236	38	201
Jalasinghadevi	0	0	189	28	133	20	345	52	261
Khorsane	0	0	150	32	100	21	217	46	169
Shivaratrighat	50	20	69	28	0	0	130	52	107
Barnebelayate	100	30	50	15	100	30	89	26	88
Tarebhir	100	40	67	27	0	0	86	34	77
Salleri	0	0	8	6	30	21	107	74	25
Salghari	0	0	39	14	40	15	196	71	83
Arunodaya	0	0	0	0	0	0	73	100	70
Rupadhari	0	0	52	33	43	27	62	39	53
Chhyangripasini	0	0	0	0	0	0	43	100	37
Chhabar	95	49	64	33	0	0	36	18	62
Bancharedanda	56	28	64	33	0	0	77	39	67
Total P/H	80	21	85	22	95	25	125	33	101

Source: Field Survey, 2003

Annex Table 8-D.Decision Making Costs per Household of CF Management by Income Groups

CFUGs	Income Groups						
	Rich		Medium		Poor		Total P/H
	Rs.	%	Rs.	%	Rs.	%	Rs.
Panchakanya	198	46	114	27	116	27	141
Dakshinkali	214	38	146	26	207	36	195
Arunganga	210	40	191	36	125	24	172
Oiputang	110	20	222	40	227	41	201
Jalasinghadevi	314	43	243	34	167	23	261
Khorsane	154	31	125	25	217	44	169
Shivaratrighat	160	54	88	29	50	17	107
Barnebelayate	83	31	83	31	104	38	88
Tarebhir	98	41	101	42	43	18	77
Salleri	16	23	24	35	29	42	25
Salghari	130	50	76	29	52	20	83
Arunodaya	59	29	119	58	27	13	70
Rupadhari	62	37	44	26	62	37	53
Chhyangripasini	28	37	48	63	0	0	37
Chhabar	32	19	47	28	89	53	62
Bancharedanda	104	49	78	37	29	14	67
Total P/H	126	41	94	30	90	29	101

Source: Field Survey, 2003

Annex Table 8-E.Implementation Cost per Household of CF Management by Caste/Ethnic Groups

CFUGs	Dalit		Janajati		Newar		Brahmin/Chhetri		Total P/H
	Rs	%	Rs	%	Rs	%	Rs	%	Rs
Panchakanya	1025	24	1163	27	1044	24	1117	26	1076
Dakshinkali	0	0	1050	26	1550	39	1417	35	1203
Arunganga	850	19	1144	26	1230	28	1225	28	1166
Oiputang	1136	33	1271	37	0	0	1050	30	1204
Jalasinghadevi	0	0	2200	35	2083	34	1925	31	2030
Khorsane	0	0	1450	44	933	29	883	27	1069
Shivaratrighat	1000	35	1006	35	0	0	886	31	929
Barnebelayate	1000	21	1000	21	1300	27	1465	31	1423
Tarebhir	1350	42	953	30	0	0	927	29	983
Salleri	1050	26	942	23	963	24	1108	27	979
Salghari	1183	27	830	19	910	21	1458	33	1105
Arunodaya	1200	51	0	0	0	0	1142	49	1145
Rupadhari	0	0	839	31	1225	45	650	24	850
Chhyangripasini	0	0	325	36	0	0	585	64	550
Chhabar	817	36	790	35	0	0	660	29	771
Bancharedanda	568	28	744	37	0	0	700	35	685
Total P/H	938	23	984	24	1144	28	1075	26	1032

Source: Field Survey, 2003

Annex Table 8-F.Implementation Cost per Household of CF Management by Income Groups

CFUGs	Income Groups						Total P/H
	Rich		Medium		Poor		
	Rs.	%	Rs.	%	Rs.	%	Rs.
Panchakanya	1033	32	1217	38	993	31	1076
Dakshinkali	1370	39	950	27	1225	35	1203
Arunganga	1220	35	1083	31	1183	34	1166
Oiputang	1050	30	1279	36	1225	34	1204
Jalasinghadevi	2371	42	1980	35	1317	23	2030
Khorsane	838	26	1125	35	1210	38	1069
Shivaratrighat	1112	40	1000	36	686	25	929
Barnebelayate	1533	36	1459	34	1267	30	1423
Tarebhir	1250	41	970	32	817	27	983
Salleri	1072	36	1024	34	909	30	979
Salghari	1140	35	1181	36	975	30	1105
Arunodaya	1281	38	1083	32	1000	30	1145
Rupadhari	633	26	845	35	967	40	850
Chhyangripasini	575	52	521	48	0	0	550
Chhabar	763	33	692	30	858	37	771
Bancharedanda	777	37	688	33	612	29	685
Total P/H	1124	35.4	1036	33.3	958	31.4	1032

Source: Field Survey, 2003

Annex Table 8-G. Monitoring Cost per Household of CF Management by Caste/Ethnic Groups

CFUGs	Dalit		Janajati		Newar		Brahmin/Chhetri		Total P/H
	Rs	%	Rs	%	Rs	%	Rs	%	Rs
Panchakanya	0	0	64	30	64	30	86	40	54
Dakshinkali	0	0	70	45	0	0	86	55	54
Arunganga	0	0	0	0	0	0	110	100	81
Oiputang	110	51	18	9	0	0	86	40	68
Jalasinghadevi	0	0	64	33	0	0	129	67	68
Khorsane	0	0	0	0	0	0	129	100	41
Shivaratrighat	0	0	0	0	0	0	96	100	91
Barnebelayate	0	0	0	0	0	0	9	100	11
Tarebhir	71	70	13	13	0	0	18	17	33
Salleri	0	0	8	11	27	39	36	50	39
Salghari	0	0	29	15	0	0	164	85	59
Arunodaya	0	0	0	0	0	0	14	100	14
Rupadhari	0	0	0	0	0	0	0	0	0
Chhyangripasini	0	0	0	0	0	0	0	0	0
Chhabar	0	0	0	0	0	0	0	0	0
Bancharedanda	23	26	28	31	0	0	38	43	74
Total P/H	29	24	16	14	20	17	53	45	33

Source: Field Survey, 2003

Annex Table 8-H. Monitoring Cost per Household of CF Management by Income Groups

CFUGs	Income Groups						Total P/H
	Rich		Medium		Poor		
	Rs.	%	Rs.	%	Rs.	%	
Panchakanya	86	52	43	26	37	22	54
Dakshinkali	103	52	64	32	32	16	54
Arunganga	103	64	57	36	0	0	81
Oiputang	0	0	37	30	86	70	68
Jalasinghadevi	110	52	103	48	0	0	68
Khorsane	64	38	0	0	103	62	41
Shivaratrighat	134	100	0	0	0	0	91
Barnebelayate	0	0	0	0	36	100	11
Tarebhir	27	40	41	60	0	0	33
Salleri	24	48	12	24	14	29	39
Salghari	103	53	32	17	60	31	59
Arunodaya	0	0	43	100	0	0	14
Rupadhari	0	0	0	0	0	0	0
Chhyangripasini	0	0	0	0	0	0	0
Chhabar	0	0	0	0	0	0	0
Bancharedanda	56	57	43	43	0	0	74
Total P/H	58	56	25	24	20	20	33

Source: Field Survey, 2003

Annex Table 8-I. Total Transaction Costs per Household of CF Management by Caste/Ethnic Groups

CFUGs	Dalit		Janajati		Newar		Brahmin/ Chhetri		Total P/H
	Rs	%	Rs	%	Rs	%	Rs	%	Rs
Panchakanya	1125	21.9	1336	26.0	1262	24.6	1410	27.5	
Dakshinkali	0	0.0	1325	28.0	1717	36.3	1688	35.7	
Arunganga	1000	19.2	1256	24.1	1390	26.7	1555	29.9	1388
Oiputang	1413	33.0	1501	35.0	0	0.0	1371	32.0	1459
Jalasinghadevi	0	0.0	2454	34.7	2217	31.4	2398	33.9	2377
Khorsane	0	0.0	1600	41.4	1033	26.8	1229	31.8	1298
Shivaratrighat	1050	32.4	1075	33.2	0	0.0	1112	34.4	1097
Barnebelayate	1100	21.5	1050	20.5	1400	27.4	1563	30.6	1519
Tarebhir	1521	42.4	1033	28.8	0	0.0	1031	28.7	1081
Salleri	1050	24.5	958	22.4	1020	23.8	1251	29.2	1019
Salghari	1183	24.4	897	18.5	950	19.6	1819	37.5	1247
Arunodaya	1200	49.4	0	0.0	0	0.0	1229	50.6	1228
Rupadhari	0	0.0	891	31.0	1268	44.2	712	24.8	903
Chhyangripasini	0	0.0	325	34.1	0	0.0	627	65.9	587
Chhabar	912	37.0	854	34.7	0	0.0	696	28.3	833
Bancharedanda	647	28.2	836	36.4	0	0.0	815	35.5	783
Total P/H	1047	22.5	1085	23.4	1259	27.1	1253	27.0	1166

Source: Field Survey, 2003

Annex Table 8-J. Total Transaction Costs per Household of CF Management by Income Groups

	Income Groups									Total P/H	
	Rich			Medium			Poor				
COMM	N	Rs.	Percent	N	Rs.	Percent	N	Rs.	Percent	N	Rs
Panchakanya	6	1317	34.3	6	1374	35.8	7	1146	29.9	19	1272
Dakshinkali	5	1687	39.1	4	1161	26.9	8	1464	34.0	17	1458
Arunganga	10	1533	36.7	9	1332	31.9	12	1308	31.4	31	1388
Oiputang	5	1160	27.4	7	1538	36.3	12	1538	36.3	24	1459
Jalasinghadevi	7	2796	42.3	5	2326	35.2	3	1483	22.5	15	2377
Khorsane	4	1055	27.5	4	1250	32.6	5	1530	39.9	13	1298
Shivaratrighat	13	1405	43.5	4	1088	33.7	11	736	22.8	28	1097
Barnebelayate	3	1617	35.4	17	1542	33.8	6	1406	30.8	26	1519
Tarebhir	8	1375	41.1	10	1112	33.2	12	860	25.7	30	1081
Salleri	9	1112	35.6	17	1060	33.9	23	952	30.5	49	1019
Salghari	5	1373	36.6	8	1289	34.4	6	1087	29.0	19	1247
Arunodaya	8	1340	37.1	6	1245	34.5	5	1027	28.4	19	1228
Rupadhari	3	695	26.6	10	889	34.0	6	1029	39.4	19	903
Chhyangripasini	8	603	51.4	7	569	48.6	0	0	0.0	15	587
Chhabar	4	795	32.0	13	740	29.8	12	947	38.2	29	833
Bancharedanda	13	937	39.3	16	808	33.9	17	640	26.8	46	783
Total P/H	111	1308	37.1	143	1155	32.7	145	1068	30.2	399	1166

Source: Field Survey, 2003

Annex Table 8-K. Membership Fees per Household of CF Management by Caste/Ethnic Groups

CFUGs	Dalit		Janajati		Newar		Brahmin/Chhetri		Total P/H
	NR	%	NR	%	NR	%	NR	%	NR
Panchakanya	300	25	300	25	300	25.0	300	25.0	300
Dakshinkali	0	0	200	33	200	33.3	200	33.3	200
Arunganga	300	25	300	25	300	25.0	300	25.0	300
Oiputang	200	33	200	33	0	0.0	200	33.3	200
Jalasinghadevi	0	0	275	34	300	36.9	238	29.2	260
Khorsane	0	0	200	33	200	33.3	200	33.3	200
Shivaratrighat	200	33	200	33	0	0.0	200	33.3	200
Barnebelayate	200	18	300	27	300	27.3	300	27.3	296
Tarebhir	300	33	300	33	0	0.0	300	33.3	300
Salleri	200	25	200	25	200	25.0	200	25.0	200
Salghari	300	25	300	25	300	25.0	300	25.0	300
Arunodaya	200	50	0	0	0	0.0	200	50.0	200
Rupadhari	0	0	200	33	200	33.3	200	33.3	200
Chhyangripasini	0	0	300	50	0	0.0	300	50.0	300
Chhabar	200	33	200	33	0	0.0	200	33.3	200
Bancharedanda	300	33	300	33	0	0.0	300	33.3	300
Total P/H	256	25.5	237	23.6	252	25.2	258	25.7	249

Source: Field Survey, 2003

Annex Table 8-L Membership Fees per Household of CF Use and Management by Income Groups

	Income Groups						
	Rich		Medium		Poor		Total P/H
COMM	Rs.	%	Rs.	%	Rs.	%	Rs.
Panchakanya	300	33	300	33	300	33	300
Dakshinkali	200	33	200	33	200	33	200
Arunganga	300	33	300	33	300	33	300
Oiputang	200	33	200	33	200	33	200
Jalasinghadevi	243	31	280	35	267	34	260
Khorsane	200	33	200	33	200	33	200
Shivaratrighat	200	33	200	33	200	33	200
Barnebelayate	300	34	294	33	300	34	296
Tarebhir	300	33	300	33	300	33	300
Salleri	200	33	200	33	200	33	200
Salghari	300	33	300	33	300	33	300
Arunodaya	200	33	200	33	200	33	200
Rupadhari	200	33	200	33	200	33	200
Chhyangripasini	300	50	300	50	0	0	300
Chhabar	200	33	200	33	200	33	200
Bancharedanda	300	33	300	33	300	33	300
Total P/H	250	33.6	253	33.2	243	33.2	249

Source: Field Survey, 2003

Annex Table 8 – M. Gross Benefits per Household of CF Management by Caste/Ethnic Groups

CFUGs	Dalit			Janajati			Newar			Brahmin/Chhetri			Total		
	N	NRs	Percent	N	NRs	Percent	N	NRs	Percent	N	NRs	Percent		N	Average NRs
Panchakanya	4	4685	21.4	4	4706	21.5	8	7123	32.6	3	5357	24.5	21871	19	5822
Dakshinkali	0	0	0.0	11	4492	31.0	3	5825	40.3	3	4153	28.7	14470	17	4667
Arunganga	3	4763	22.3	9	5226	24.5	5	4762	22.3	14	6606	30.9	21357	31	5730
Oiputang	7	6599	37.8	14	5196	29.7	0	0	0.0	3	5673	32.5	17468	24	5665
Jalasinghadevi	0	0	0.0	4	7856	40.3	3	6247	32.0	8	5412	27.7	19515	15	6230
Khorsane	0	0	0.0	4	5333	31.6	3	6187	36.6	6	5379	31.8	16899	13	5551
Shivaratrighat	2	1965	18.1	8	3575	33.0	0	0	0.0	18	5306	48.9	10846	28	4573
Barnebelayate	1	7230	38.7	1	2010	10.8	1	4850	25.9	23	4603	24.6	18693	26	4614
Tarebhir	3	5045	33.7	16	4354	29.1	0	0	0.0	11	5587	37.3	14986	30	4875
Salleri	5	5046	22.9	26	5916	26.9	12	6237	28.4	6	4788	21.8	21987	49	5768
Salghari	3	6263	19.5	5	7169	22.3	5	8212	25.5	6	10545	32.8	32189	19	8367
Arunodaya	1	2926	34.1	0	0	0.0	0	0	0.0	18	5662	65.9	8588	19	5518
Rupadhari	0	0	0.0	14	5315	30.3	2	6090	34.7	3	6130	35.0	17535	19	5525
Chhyangripasini	0	0	0.0	2	6111	45.3	0	0	0.0	13	7379	54.7	13490	15	7210
Chhabar	3	5187	29.9	21	5174	29.8	0	0	0.0	5	6980	40.3	17341	29	5487
Bancharedanda	11	4693	27.6	17	6576	38.7	0	0	0.0	18	5708	33.6	16977	46	5786
Grand Total	43	5108	22.5	156	5370	23.6	42	6393	28.2	158	5837	25.7	22708	399	5635

Source: Field Survey, 2003

Annex Table 8-N. Gross Benefits per Household of CF Management by Income Groups Income Groups

CFUGs	Rich			Medium			Poor			Total	
	N	Gr.income/* household		N	Gr.income/ household		N	Gr.income/ household		N	Total Average
		Rs.	%		Rs.	%		Rs.	%		
Panchakanya	6	7596	43	6	6641	37	7	3599	20	19	5822
Dakshinkali	5	6862	44	4	6089	39	8	2585	17	17	4667
Arunganga	10	8053	46	9	6121	35	12	3500	20	31	5730
Oiputang	5	6605	36	7	7119	39	12	4424	24	24	5665
Jalasinghadevi	7	7067	40	5	6380	37	3	4030	23	15	6230
Khorsane	4	7515	44	4	5937	35	5	3672	21	13	5551
Shivaratrighat	13	6111	45	4	4915	36	11	2630	19	28	4573
Barnebelayate	3	6187	45	17	5125	37	6	2378	17	26	4614
Tarebhir	8	7174	46	10	5913	38	12	2478	16	30	4875
Salleri	9	10026	49	17	7389	36	23	2903	14	49	5768
Salghari	5	13688	52	8	6935	26	6	5841	22	19	8367
Arunodaya	8	7050	45	6	5638	36	5	2922	19	19	5518
Rupadhari	3	6203	39	10	6733	42	6	3173	20	19	5525
Chhyangripasini	8	7725	54	7	6622	46	0	0	0	15	7210
Chhabar	4	7265	41	13	6738	38	12	3539	20	29	5487
Bancharedanda	13	8565	47	16	6739	37	17	2764	15	46	5786
Grand Total	111	7786	45	143	6397	37	145	3236	18	399	5635

Source: Field Survey, 2003

***** Gross income per household

Annex Table 8-O Gross Cost per Household of Use and Management of CF by Caste/Ethnic Groups

CFUGs	Dalit		Janajati		Newar		Brahmin/Chhetri		Total P/H
	NR	%	NR	%	NR	%	NR	%	NR
Panchakanya	3307	21.5	3697	24.1	4400	28.6	3968	25.8	3954
Dakshinkali	0	0.0	3303	29.8	4000	36.1	3787	34.2	3511
Arunganga	3525	22.4	3839	24.4	3604	22.9	4761	30.3	4187
Oiputang	4506	38.2	3610	30.6	0	0.0	3687	31.2	3881
Jalasinghadevi	0	0.0	5319	35.6	4783	32.0	4857	32.5	4965
Khorsane	0	0.0	3920	33.9	3904	33.8	3740	32.3	3833
Shivaratrighat	1873	21.8	2962	34.5	0	0.0	3742	43.6	3386
Barnebelayate	4200	31.1	2071	15.3	2936	21.7	4305	31.9	4162
Tarebhir	3907	34.3	3407	29.9	0	0.0	4064	35.7	3698
Salleri	3751	24.5	3260	21.3	4325	28.3	3948	25.8	3655
Salghari	3958	23.2	3754	22.0	3984	23.3	5382	31.5	4361
Arunodaya	3371	43.8	0	0.0	0	0.0	4328	56.2	4278
Rupadhari	0	0.0	3445	29.3	4429	37.7	3885	33.0	3618
Chhyangripasini	0	0.0	3857	43.9	0	0.0	4925	56.1	4783
Chhabar	3634	29.6	3788	30.8	0	0.0	4869	39.6	3959
Bancharedanda	3540	29.3	4583	37.9	0	0.0	3977	32.9	4097
Total P/H	3694	23.4	3656	23.1	4164	26.3	4297	27.2	3967

Source: Field Survey, 2003.

Annex Table 8-P. Gross Cost per Household of Use and Management of CF by Income Groups

CFUGs	Rich		Medium		Poor		Total P/H
	Rs.	Percent	Rs.	Percent	Rs.	Percent	Rs.
Panchakanya	4736	39	4439	37	2867	24	3954
Dakshinkali	4586	41	4084	36	2553	23	3511
Arunganga	5589	44	4362	34	2888	22	4187
Oiputang	4035	33	4743	39	3314	27	3881
Jalasinghadevi	5573	40	5166	37	3210	23	4965
Khorsane	4271	37	4221	36	3173	27	3833
Shivaratrighat	4615	46	3412	34	1925	19	3386
Barnebelayate	5102	41	4514	37	2695	22	4162
Tarebhir	5169	44	4301	37	2215	19	3698
Salleri	5183	43	4424	37	2489	21	3655
Salghari	5856	44	4590	35	2809	21	4361
Arunodaya	5274	43	4008	33	3008	24	4278
Rupadhari	3832	36	4248	40	2460	23	3618
Chhyangripasini	4810	50	4752	50	0	0	4783
Chhabar	5175	41	4504	36	2963	23	3959
Bancharedanda	5230	42	4827	38	2543	20	4097
Total P/H	5017	41.0	4469	37.0	2669	22.0	3967

Source: Field Survey, 2003.

Annex Table 8-Q. Distribution of Gross/Net benefits – Costs and B/C Ratio between FUGs by Caste/Ethnic Groups (in Percentage)

FUG	Dalit				Janajati				Newa		
	B[a]	C[b]	B-C[c] (Net Benefit)	B/C[d] Ratio	B	C	B-C (Net Benefit)	B/C Ratio	B	C	(Net B
Panchakanya	21.4	21.5	-0.1	1.00	21.5	24.1	-2.6	0.89	32.6	28.6	
Dakshinkali	0.0	0.0	0	0.00	31.0	29.8	1.2	1.04	40.3	36.1	4
Arunganga	22.3	22.4	-0.1	1.00	24.5	24.4	0.1	1.00	22.3	22.9	-0
Oiputang	37.8	38.2	-0.4	0.99	29.7	30.6	-0.9	0.97	0.0	0.0	
Jalasinghadevi	0.0	0.0	0	0.00	40.3	35.6	4.7	1.13	32.0	32.0	
Khorsane	0.0	0.0	0	0.00	31.6	33.9	-2.3	0.93	36.6	33.8	2
Shivaratrighat	18.1	21.8	-3.7	0.83	33.0	34.5	-1.5	0.96	0.0	0.0	
Barnebelayate	38.7	31.1	7.6	1.24	10.8	15.3	-4.5	0.71	25.9	21.7	4
Tarebhir	33.7	34.3	-0.6	0.98	29.1	29.9	-0.8	0.97	0.0	0.0	
Salleri	22.9	24.5	-1.6	0.93	26.9	21.3	5.6	1.26	28.4	28.3	0
Salghari	19.5	23.2	-3.7	0.84	22.3	22.0	0.3	1.01	25.5	23.3	2
Arunodaya	34.1	43.8	-9.7	0.78	0.0	0.0	-	-	0.0	0.0	
Rupadhari	0.0	0.0	0	0.00	30.3	29.3	1	1.03	34.7	37.7	-
Chhyangripasini	0.0	0.0	0	0.00	45.3	43.9	1.4	1.03	0.0	0.0	
Chhabar	29.9	29.6	0.3	1.01	29.8	30.8	-1	0.97	0.0	0.0	
Bancharedanda	27.6	29.3	-1.7	0.94	38.7	37.9	0.8	1.02	0.0	0.0	
Grand Total	22.5	23.4	-0.9	0.96	23.6	23.1	0.5	1.02	28.2	26.3	1

Source: Computed from Annex Tables 8-M and 8-O.

a. Benefit, b. Cost, c. Benefit minus Cost (Net Benefit), d. Benefit Cost Ratio

Annex Table 8-R. Distribution of Gross/Net benefits - Costs and B/C Ratio between FUGs by Income Groups (in Percentage) Income Groups

FUG	Rich				Medium			
	B[a]	C[b]	B-C[c] (Net Benefit)	B/C[d] (Ratio)	B	C	B-C (Net Benefit)	B/C (Ratio)
Panchakanya	43	39	4	1.08	37	37	0	1.01
Dakshinkali	44	41	3	1.08	39	36	3	1.08
Arunganga	46	44	2	1.05	35	34	1	1.02
Oiputang	36	33	3	1.09	39	39	0	1.00
Jalasinghadevi	40	40	0	1.01	37	37	0	0.99
Khorsane	44	37	7	1.20	35	36	-1	0.96
Shivaratrighat	45	46	-1	0.97	36	34	2	1.05
Barnebelayate	45	41	4	1.09	37	37	0	1.02
Tarebhir	46	44	2	1.04	38	37	1	1.03

Salleri	49	43	6	1.15	36	37	-1	0.99
Salghari	52	44	8	1.17	26	35	-9	0.76
Arunodaya	45	43	2	1.05	36	33	3	1.11
Rupadhari	39	36	3	1.06	42	40	2	1.04
Chhyangripasini	54	50	4	1.07	46	50	-4	0.93
Chhabar	41	41	0	1.01	38	36	2	1.08
Bancharedanda	47	42	5	1.14	37	38	-1	0.97
Grand Total	45	41	4	1.09	37	37	0	1.00

Source: Computed from Annex Tables 8-N and 8-P.

a. Benefit, b. Cost, c. Benefit minus Cost (Net Benefit), d. Benefit Cost Rat.