

# CHAPTER 1

## INTRODUCTION

### General Background

Community forest (CF) in Nepal is a part of the national forest in Nepal handed over to a forest user group (FUG), which is recognized by the Forest Act (1993) as a self-governed autonomous corporate body. The legislation allows FUG to develop, conserve, use and manage the forest and sell and distribute forest products independently, according to an approved forest operational plan. However, the ownership of the land on which the forest grows remains with the government. The involvement of communities through the encouragement of forest user's group has proved to be most successful and this policy continues to attract a high priority. During its twenty-five years of implementation, over 1.1 million hectares of forestland has been handed over to more than 13500 FUGs for management (Shrestha et.al., 2004). Master Plan for Forestry Sector (1988) presented a plan to meet people's basic need for fuel wood, timber, fodder and other forest products on a sustained basis and promote people's participation in forestry resources development, management and utilization (Ojha, 2000).

Rural Nepalese households heavily rely on forests for diverse range of resources that provide both direct household inputs of fuel wood and timber and indirect inputs to farming systems in the form of grazing land, grass and tree fodder, and bedding material. Forest resources are one of the major resources directly contributing to the survival of rural people in Nepal (Upreti, 2001). As such, forest resources remain integral part of farming systems in the mid-hills, and consequently concerns on the sustainability of forest and farm systems are inseparable (Maharjan, 1998). Much

of the agricultural production system of the country directly and/ or indirectly is based on forest resources (NPC, 1998).

The agricultural system in hills invariably depends on the combined use of land, livestock and forest resources, as crop production depends on livestock systems sustained by fodder from the forests. The interrelationship between forest, livestock and farming system occurs as a result of processes and decision making on a range of scales. Yield from the crop production system (field level) are intrinsically dependent on decisions of resource access, availability and entitlement controlled at the village (community) level. Further yields are also influenced by management decisions within the farm system as governed by relations to household and animal systems. Indeed these concerns have been one of the main factors behind the development of CF in Nepal. Many farmers still depend heavily on organic forms of nutrient input to, maintain soil productivity.

### *Statement of the Problem*

Community forests handed-over to community are natural capital. Evidences show that there are positive changes in both forest condition and the availability of forest products, with a concurrent reduction in the time spent for collecting forest products. Thousands of FUGs have planted and protected denuded hills, carried out forest management, utilized and marketed various forest products for their livelihoods. This is giving rise to dependency on the forest resources for the local community who look after the resources. But the level of dependency for different economic regimes has never been understood. With limited empirical evidences, the academics and the developmentalists alike have always echoed the a blanket statement that community forest concept have helped people grow economically, socially and democratically in equity basis.

Farming communities of Nepal depend on forest resources for their survival and daily livelihood. The farming system of Nepal comprises land (including forests and arable land), animal enterprises, and farmers. The study intends to examine the dependency of households on forest resources under the different property regimes of forests and economic status of the households. More importantly, study also examine whether or not the economic status of households and the property regimes of forests affect the dependency level of forest users on forests.

#### *Objectives of the study*

To examine households' dependency on local forests

The amount of dependency on the forest resources versus economic status

To examine the rules and regulation of the community forests

#### *Significance of the Study*

The study has demonstrated that the level of dependency on community forest resources for different economic regime is different. The need level of the higher economic groups is lesser than those of lower economic strata. The study deals the dependency in the percentage and in the significance studies which makes it reliable for the planners to plan distribution of the resources in equity basis rather than in equality terms. The trend so far has been distributing the resources equally. The needs, however, for all the users is not seen same. So those who need the forest resources the most be given the priority. The study can be a starting point to act in such a direction for the users and for the government agencies which oversee the community forests planning and implementation.

### *Limitation of the study*

The study has been carried in a district. And the number of community forest observed studeids was only three. That makes it difficult for any king of generalization. Furthermore, the study area in Lalipur falls in a semi urban status where city-type life style is evident. It therefore can be no testimony to the community forest in the far fledged areas of Nepal where people are still totally dependent to the forest resources in their vicinity.

## CHAPTER 2

### LITERATURE REVIEW

Empirical studies show that the farming communities of Nepal depend on forest resources for their survival and daily livelihood. The farming system of Nepal comprises land (including forests and arable land), animal enterprises, and farmers. The dependency of the farming system on management policies, which transfer forest management and forest products use rights to local communities. This is commonly known as the community forestry program in Nepal. Different forest researchers suggest flexible forest management policies capable of fostering a balanced distribution of forest products to local forest users in order to fix the unbalanced relationship between farming communities and forest resources (Conway et al. 2000; Ghimire 1998; Varughese and Ostrom 2001).

Many researchers have reported the exclusive dependency of rural families of Nepal on community forests, national forests, and private forests for their daily livelihood (Frozen and Oberholder 1984; Mahat et al. 1986; Wallacea 1988; Bartlett and Malla 1992; Chetri and Pandey 1994; Dahal 1994). Pandey (1982) reports the substantial dependency of animal sectors, and thereby the livelihood of medium-income households of Nepal, on forests. Eric (1992) also reports the sole dependency of hill communities of Nepal on private forest trees and community forests for fodders and green grasses. Consistent with the findings of previous studies, Griffin et al. (1988) report that community forests in the hill regions of Nepal supply more than 20% of the total fodder demands of livestock enterprises. Sharma (1992) also reports the significant

dependency of local people on forests for grasses, fuelwood, reeds and thatch, and other forest products.

In spite of substantial scholarly works that examine the benefits of community forestry in Nepal, researchers are silent on the issues of households' dependency on forests based on the economic status of forest users and the nature of forest property regimes. In-depth analysis of household reliance on forests under different economic status and property regimes of forests is crucial for the sustainable management of forest resources.

Community forestry policies emerged in Nepal as a response to "institutional failure" at the local level, which had led to progressive degradation of hill forests. The 1976 National Forestry Plan acknowledges deterioration in the hill forest and the need for community involvement. Following the plan came amendments to the Forest Act in 1978, providing handing over of forest to *Panchayat* (lowest level of administration at the time).

Encouragement of community forestry continued over the early 1980s in various policies. In 1982 the Decentralization Act empowered *Panchayat* to form people's committees for forest management. The Seventh Five Year Plan (1985-1990) prioritized the mobilization of people's participation in forest management to ensure their subsistence needs were met. In 1987 the concept of "Forest User Groups" was introduced by the Decentralization Act (1982). As per Forest Sector Master Plan 1988, Forest Act 1993 and Forest Regulation 1995, forests have been classified as private and state owned forests. State forests are divided into community forests and national forests managed by local communities and Department of Forest and Soil Conservation (Maharjan, 2005). The Master Plan for the Forestry Sector (HMG/N, 1988) envisioned that all the accessible

forests should be handed over to FUGs. It also allocated 47% of investment in the forest sector in support of community forestry programs

Community forestry is most accurately and usefully understood as an umbrella term denoting a wide range of activities which link rural people with forests, trees, and the products and benefits to be derived from them. Gilmour and Fisher (1991) define community forestry in terms of control and management of forest resources by the rural people who use them especially for domestic purposes and as an integral part of their farming systems. Since community forestry constitutes both social and biophysical elements, they both are equally important. The "resource" can be managed effectively with a clear understanding of forest management principles and knowledge of natural system, and "social" part can be dealt with a clear understanding of a society and their relationships with the resource and institutions related to it.

The way community forestry approach used to be defined and interpreted in Nepal up until late 70s, suggests that community forestry implies 'community-resource' relations, commonly known as 'indigenous system of forest management' ( Fisher, 1989), which was widespread in Nepal's hills. During 80s and beginning of 90s, nevertheless community forestry was further conceptualized and internalized, new policy framework was crafted (HMGN, 1988), legal instruments have been in place (HMGN, 1995), various processes, methods and tools have been developed, modified, re-modified and experience gained. During this period, community forestry was understood and recognized as government's priority programme, for which the role of forest bureaucracy in the hills changed from policing to facilitating leading to the evolution of community-resource relations towards a triangular interface among community, resource and government bureaucracy.

In the late 90s, with the changing political and policy context, community forestry is being understood and conceptualized in terms of stakeholders relationship because there has not only been increasing trend of FUGs, tremendous number and types of stakeholders and service providing agencies and organizations, with diverse interests and influence have emerged and grown. The pattern of interactions among these agencies with FUGs and government organisations in fact influence each other's action, their own governance system, gender equity issues, and ultimately to the way how resource is managed and utilized, how the management plans, strategies and programmes are designed and implemented, how negotiation takes place and conflicts are resolved for effective forest management in order to achieve the desired outcomes at people's livelihoods and resource condition level. This is the context within which community forestry in Nepal is growing and always progressing. It is not like as it was in the past and it will not be in the future as it is now, therefore community forestry should be defined, redefined and understood in a dynamic way.

The present form of Nepal's community forestry is guided by the Forest Act of 1993, Forest Regulations of 1995, and the Operational Guidelines of 1995. These legal instruments have legitimized the concept of Community Forest User Group (CFUG) as an independent, autonomous and self-governing institution responsible to protect, manage and use any patch of national forest with a defined forest boundary and user group members. CFUGs are to be formed democratically and registered at the District Forest Office (DFO), with CFUG Constitution, which defines the rights of the users to a particular forest. The forest is handed over to the community once the respective members through a number of consultative meetings and processes prepares the Operational Plan (OP), a forest working plan, and submits it to the District Forest Officer (DFO) for approval. The plan has to be countersigned by the Chairperson of the CFUG. The general



assembly of the CFUG is the supreme body to finalize the plan before it is submitted to the DFO for its approval. The plan is generally implemented by an executive committee nominated by the general assembly. The successful implementation of the plan depend more on the awareness level of the community members and their participation in the process of the preparation of group constitution and the Operational plan together with the level of support that various agencies such as DFO, user group federation, NGOs, civil society organizations and local government and concerned stakeholders provide, and the relationship among themselves in supporting CFUGs.

### *Achievements and Contribution*

There are now around 12,000 Forest User Groups (FUGs) formed in Nepal during the period of 14 years with nearly 1.2 million household members, which account approximately 20% of the country's population who have taken over responsibility to manage about 850,000 ha forest areas, nearly 16% of the total forest land of the country (DOF, 2002). At the moment in Nepal, average of two FUGs are being formed every day and they are given authority and responsibility to manage and use the national forest resources.

### *Farm-forestry Iinterrelationship*

Maharjan (2005) opines that traditional Nepalese farming is a location specific environment adaptive system where farming system comprises crop, livestock and forest (inclusive of grasslands where ever they exist) as inter connected production sub-systems. Crop sub-system supplies fodder for livestock in the form of crop by-products. Livestock sub-system in turn provides draught power and manure required for sustenance of crop sub-system. Forests supply

fodder, manure and a variety of other direct and indirect benefits needed for sustainable livelihood.

Forests of Nepal meet 62% fodder needs of the country (CBS, 2002 and DoF, 2003).

Farm products are consumed locally or exchanged with various other goods/cash to secure livelihood. He adds that a balance in crop, livestock and forest production system has been maintained traditionally but now days that traditional farm-forest integrated system is changing fast. A trend of production sub-systems getting more and more independent is apparent. He emphasizes that this trend is often the outcome of the so-called nation building/modernization programs and the changes in traditional value systems. As people are unable to meet their demands from farming alone, they are turning to non-farm activities within or outside rural areas.

Mahat (1987) states that the hill farming system can be described in general as being comprised of a complex arrangement of soil, water, crops, livestock, forest and other resources within an environmental setting that the farm family manages in accordance with its preferences capabilities and available technologies. The farm families are engaged in production of crops, livestock and non-agricultural commodities such as handicrafts and other income generating activities off the farm to supplement their income.

There is no clear distinction between farming and forestry and the livelihood of the people depends directly on a range of annual and perennial crops, shrubs and trees, which may provide food, fodder, fuel and a range of other products. It is precisely the common resources such as forests, communal grazing land, water resources that permit the continued viability of the farm units and thus the forestry- farming system interrelationship is crucial to the existence of a hill farmer.

### *Impact of Community Forestry on Livelihood*

Neupane et al., (2004) state that as an impact of community forestry on livelihood, the number of households adopting vegetable cultivation in Dhading district increased from 49% to a significantly higher 89% between 1993 and 2003. They have concluded that poverty reduction can be supported by community forestry through special provisions of incentives made for poor and disadvantaged people and women to enhance their participation.

Dev et al., (2003) have identified change in levels and security of forest products and benefit flows (through improvement to the forest resource and /or improved tenure rights) as a direct impact on livelihood of local people. Improved and more sustainable flow of forest products are also due to improved resource condition and changed entitlements to use it. Regarding the consumption of forest products, they state that in case of fuel wood there is no significant difference in the total consumption between households of different categories, but there are significant differences in the type and source of fuel being used.

They conclude that the heterogeneity of households within FUGs is rarely reflected in the way FUGs manage their community resources and distribute forest products. Wealthier households tend to benefit from this *status quo* and since it is these same households who dominate the decision-making processes and assimilate most information about community forestry through organized events, they have very little incentive to alter anything or to change any of the rules governing the way FUGs operate.

## CHAPTER 3

### METHODOLOGY

#### *The Study Area*

The study was undertaken in Lamatar V.D.C, Lalitpur district of Central Nepal. According to the population census 2001, total population of Lalitpur district is 337785 of which 172455 were male and 165330 were female in Lalitpur district. There are 68922 households in Lalitpur . Then average household size is 4.9 in Lalitpur. The district is multi-caste society where the people belong to the different caste/ethnic groups such as *Brahmin, Chhetri, Newars, Rai*, etc. and some other occupational castes; *Kami* and *Damai*. The average literacy rate in the Lalitpur district is 70.77%.

The area has a sub- tropical and temperate climate There are altogether 167 community forest user groups The total area of community forest handed over to local communities is 9610 hectare in Lalitpur district In terms of the organizational and spatial hierarchy of the Ministry of Forestand Soil Conservation the forest resources fall under the District Forest Office (DFO) Lalitpur which administers, community forests management activities in the area.

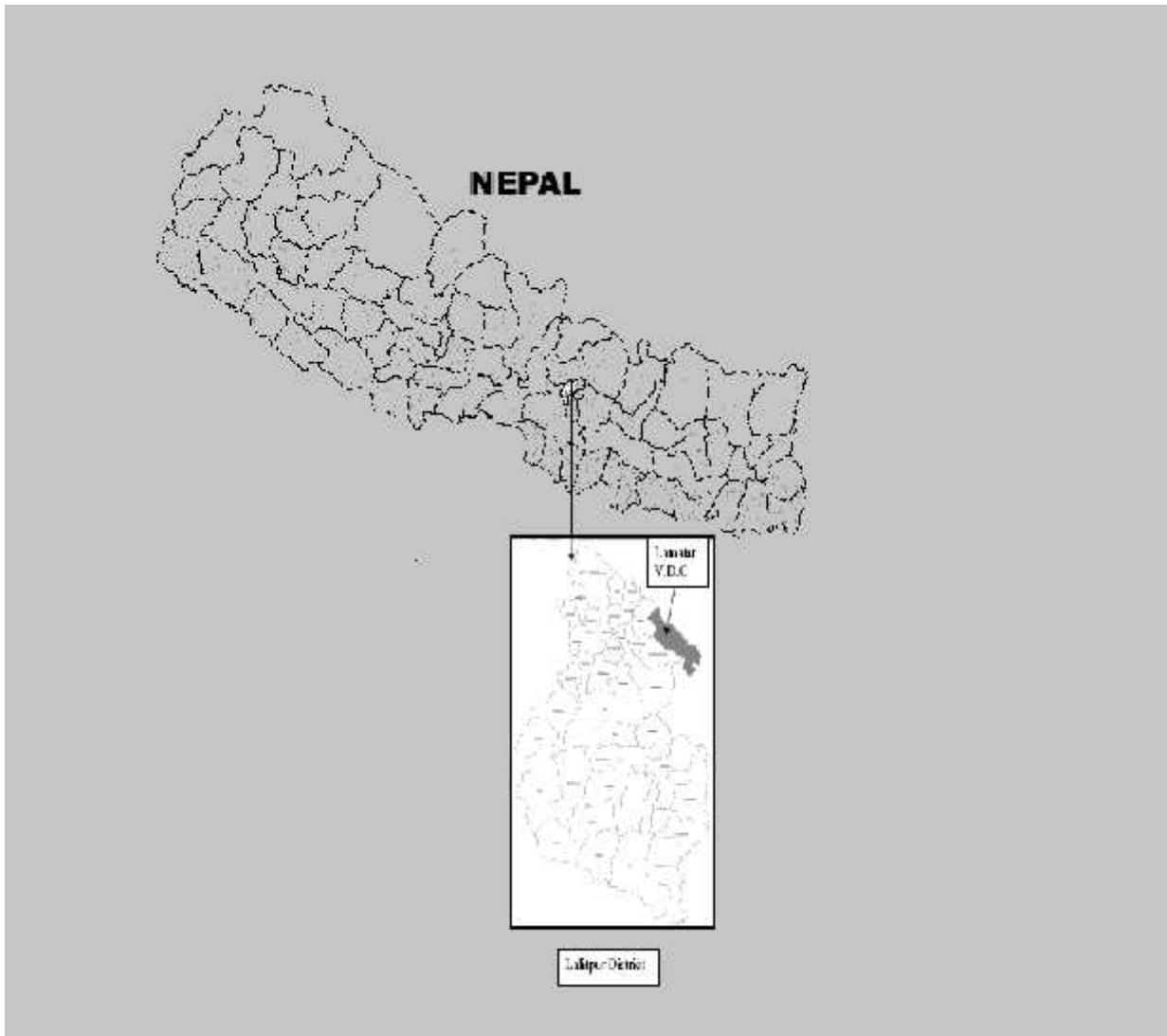


Figure 2: Map of Nepal showing the study sites in Lalitpur District

Questionnaire surveys were conducted in selected three community FUGs. Table 1 presents the general information about the selected community forest user groups (CFUGs).

Table 1: General information about the selected CFUGs

	district		
Forest user group	Kafle	Patle	Gomati
Forest area (ha)	94	105	60
Total household	65	142	51
Grazing practice	Restricted	Restricted	Restricted
Ground-grass collection	Nov-Feb	Dec-Feb	Nov-Feb
Fodder collection	Nov-Feb	Dec-Feb	Nov-Feb
Leaf litter collection	Nov-Feb	Dec-Feb	Nov-Feb
Fuel wood collection	Nov-Feb	Dec-Feb	Nov-Feb
Pole/Timber collection	Nov-Feb	Dec-Feb	Nov-Feb
Forest handover (year)to CFUG	1994	1993	2002
Sample size	17	44	14

### *Methods*

*Sampling design.* Detailed discussion with the DFO staffs was held for analyzing the FUGs records. Depending on the population distribution of user's group and the size of community forest, the survey ensured that proportionate numbers of households were selected for interviews in each CFUG for all three forests representing rural and semi-urban settings. Based on the records/name lists of the selected CFUGs, wealth ranking exercise was conducted with the help of key informants and the

committee members in each CFUG. Most commonly three wealth classes rich, medium and poor were identified using criterion for ranking given in the table.

**Table 2:** Categorizing the economic regime of community forest users

<b>Low economic status</b>	<b>Medium economic status</b>	<b>High Economic status</b>
<i>Very few assets, lack basic necessities, Sells labor most days or through out the year, Holds little or landless, has a house of hay roof.</i>	A few household assets, can manage necessities, sells labor in market for subsistence, has a house roofed with corrugated steel. Land holding < ½ ropani	Surplus food, some, holds household assets, some luxurious Large land > 2 ropani Business or permanent job

Out of total households in each CFUG, 25% (65) households were selected using stratified random sampling method to acquire data on types and quantity of forest products collected from community forest and the methods for using forest products for crop production (Table 1). The sample consists of households from rich, medium and poor wealth.

Field data was collected during October and November 2007. Taking into account the rural context where people are skeptic to structured questionnaire and formal interviews, the research was designed using semi-structured questionnaires.

*Statistical analysis.* Collected data were coded before they were analyzed using statistical software in the computer. The descriptive statistics such as frequencies, percentages, measure of central tendency, standard deviation and minimum, maximum were calculated for presenting and summarizing the demographic data. The types and average quantity of forest products collected from CF for various crop productions, total crop production and average income from crop production among households with different wealth class were calculated. Multiple comparisons of means was done in Statistical Package for Social Science (SPSS) with analysis of variance and Least Significant Difference (LSD) between different wealth class households and variables



## CHAPTER IV

### ANALYSIS OF DATA AND FINDINGS

#### *Analysis of descriptive Data*

Table 3 shows the comparative analysis of the different households' dependency on forest products in three selected community forests in district namely Kafle, Patle and Gomati. Analysis shows that the dependency of households on forest products differs from place to place and from product to product. A low degree of forest product dependency was recorded when a household collected small amount of forest products or depended on community forest for less than 2.5 months in the year. In this situation, households derive up to 20% of their total demand for forest products from community forests in a year. Households manage the remaining demand for forest products by obtaining them from private-land tress and local markers. At a low degree of forest product dependency, households experience a low level of scarcity of forest products.

**Table 3.** Forest product collection activities in different community forests by households by different economic status

Community Forest	Fuelwood			Timber			Grass and Fodder			Non-timber			Litter and Bedding		
	LES	MES	HES	LES	MES	HES	LES	MES	HES	LES	MES	HES	LES	MES	HES
<b>Kafle</b>	•	○	-	-	•	•	○	-	-	○	○	○	-	-	-
<b>Patle</b>	•	•	•	•	•	•	○	○	-	○	-	○	-	○	-
<b>Gomati</b>	○	○	-	-	-	-	○	-	-	○	-	-		-	-

Source: Field Survey

LES, Low economic status; MES, medium economic status; HES, High economic status. •, High degree of forest product collection activity or dependency; O, medium degree of forest product collection activity or dependency; -, low degree of forest product collection activity or dependency

In the medium degree of forest product dependency, households gather forest products for 2.5 to 6 months from community forests. Households collect approximately 20%–50% of forest products from the community forests. The rest of the requirement for forest products is met from alternative sources. A high degree of forest products dependency was recorded for a household that relied mostly on community forests. In the high degree of forest products dependency category, households try to collect approximately 50%–100% of forest products from community forests. Households with a high degree of forest products dependency experience chronic scarcity of forest products. Low economic status households mostly fell into this group.

Table 3 shows households' dependency on forest products based on different economic status, and also shows how fuelwood, grasses and fodders, litter and bedding materials, and non-timber forest products (NTFP), and timber collection trends or levels change with a change in the economic condition of households. Levels of forest product collection activities reflect the degree of dependency of households on forests. In order to analyze the degree of forest products dependency, respondents were asked about their level of reliance on community forests, national forest, and private-land trees for different forest products in terms of number of months.

In all three community forests of the study area, both low and medium economic status households show a higher degree of dependency for fuelwood. This result is due to the fact that, in Nepal, most of the low economic status households have no additional sources of income and survive mostly by selling fuelwood to nearby markets. High economic status

households show low levels of dependency for forest products other than timber and NTFP. This finding is consistent with pre study expectations. In most cases, high economic status households own businesses and rarely need forest products such as fodders, grasses, litter and bedding materials from the community forests. In most of the community forestries of the study area, the dependency of medium economic status households for grasses and fodders, litter and bedding materials and NTFP ranges from medium to high. Most of the medium economic status households are farmers and therefore need grass and fodders, litter and bedding materials and NTFP to support their animal enterprises and farming systems.

In spite of the high degree of dependency of low economic status families for fuelwood, the rules and regulations of community forestries prohibit farmers from collecting an abundant amount of fuelwood or other forest products from their local community forest. In this situation, low economic status households mostly survive by illegally harvesting fuelwood, timber, and other forest products from the national forests of nearby areas. In most cases, medium and high economic status households do not involve themselves directly in illegal harvesting of forest products from the national forests due to the risk involved. However, they meet their need for forest products by purchasing them from the low economic status households.

This study also evaluates the impacts of different rules and regulations of community forestries on forest product collection activities under different property regimes. Table 4 shows the different kinds of rules and regulations or entry restrictions for collecting different types of forest products in the community forestries of the study area. Community

forestry adopts strategies of free entry, entry by paying fees, entry restriction on collecting medicinal plants, and complete entry restrictions on collecting forest products. The degree of restriction is directly correlated with the level of supply and economic importance of forest products. For example, there is no entry restriction to collect litter and bedding materials in any community forestry of the study area, while all community forestries have placed some restrictions on collecting fuelwood, timber, and NTFP.

**Table 4:**The rules and regulations of access to different forest products in different community forests of research sites

Forest user groups	Grazing	Fuelwood	Fodder and grasses	Litter and bedding	Timber	Monitoring
Kafle	CR	PR	PR	PR	PR	Yes
Patle	CR	PR	PR	PR	PR	Yes
Gomati	CR	PR	PR	PR	PR	Yes

Source: Field Survey PR (partial restriction), restriction is applied for 9 months but free in only three months as agreed by the CFUG , CR (complete restriction), members are completely prohibited to extract stone, gravel, sand, soil and other forest products which have serious impacts on the environment and biodiversity and also grazing

This study shows the different impacts on the households of different entry restrictions on forest product collection activities. Generally, a higher level of forest product collection activity occurs when entry is free or when access to forest products is not restricted. As expected, low-level forest product collections occur when entry is restricted. Analysis

further shows that the majority of local households collect larger amounts of fuelwood, followed by fodder and grass, then timber from the community forests, and larger amounts of NTFP from national forests. Most of the community forests of the study area also adopt a monitoring arrangement to effectively implement their rules and regulations, and thereby increase the resource's stock and regular supply of forest products to their members.

### *Results of $\chi^2$ Tests*

The study tested the degree of household dependency for different forest products across different community forestries in the study area. Except for timber, the degree of dependency on forest products was found to be significant with respect to the economic status of households. Tables 5–8 show the results of  $\chi^2$  tests, with the observed and expected frequencies of dependency for fuelwood, litter and bedding materials, timber, and NTFP, respectively. Table 5 depicts the  $\chi^2$  for fuel wood dependency,  $\chi^2 = 125.6$ ,  $P = 0.001$ ,  $df = 4$ . The result shows that a household's economic status is statistically significant for the degree of fuelwood dependency. As expected, the degree of fuelwood dependency in community forests is higher for low economic status households. The observed degree of fuelwood collection for low economic status people is greater than the expected value at a high degree of dependency ( $116 > 79$ ).

**Table 5:** Frequencies of fuelwood collection by households of different economic status

Timber	LES		MES		HES		Total
	Observed	Expected	Observed	Expected	Observed	Expected	Observed
L	31	60.4	54	70.3	87	41.3	172
M	24	31.6	47	36.8	19	21.6	90
H	116	79	98	91.9	11	54	225
Total	171		199		117		487

$t^2=125.6$  , distribution is significant at 0.1% level

L, low degree of forest product collection activity; M, medium degree of forest collection activity; H, high degree of forest product collection activity

The analysis shows that the degree of grass and fodder dependency was medium to high for low and medium economic status households. Medium economic status households are mostly farming families and need grasses and fodders to support animal farming. Some of the low economic status households also raise a small number of animals for additional income, resulting in a medium to high degree of dependency for grasses and fodders. As to litter and bedding material collection  $t^2=27.7$  ( $P = 0.001$ ). The results show that a few of the low economic status households have a high degree of litter and bedding materials dependency, while the majority has a medium degree of dependency. The analysis shows that the degree of dependency for litter and bedding materials is moderate for most medium economic status households, while high economic status households show a low degree of litter and bedding materials dependency (Table 6).

**Table 6:** Frequencies of litter and bedding materials collection by households of different economic status

	LES		MES		HES		Total
	Observed	Expected	Observed	Expected	Observed	Expected	Observed
L	45	54.6	54	65.8	62	40.6	161
M	83	76.9	106	92.7	38	57.3	227
H	9	5.4	5	6.5	2	4.0	16
<b>Total</b>	137		165		102		404

$t^2=27.7$   $df=4$  The distribution is significant at 0.1% level

L, low degree of forest product collection activity; M, medium degree of forest collection activity; H, high degree of forest product collection activity

The analysis of degree of timber dependency and economic status of household gives statistically nonsignificant results ( $t^2=3.62$ ) (Table 7). The no significant results occur because the government of Nepal restricts the harvesting of green mature trees for timber purposes from both community and national forests. In addition, community forestries of the study area impose some restrictions, which mostly discourage the harvesting of timber from the community forests. Most of the forest user groups of the study areas distribute a fixed amount of timber each year from dead trees to its members, which is either based on the principle of equity or a decision made by the assembly of forest user groups.

**Table 7:** Frequencies of timber collection by households of different economic status

Timber	LES		MES		HES		Total
	Observed	Expected	Observed	Expected	Observed	Expected	Observed
L	101	96.75	114	122.9	69	64.2	284
M	11	12.60	18	16.0	8	8.4	37
H	43	45.6	65	58.0	26	30.3	134
Total	155		197		103		455

$\chi^2=3.26$ , distribution is no-significant at 0.1% level

L, low degree of forest product collection activity; M, medium degree of forest collection activity; H, high degree of forest product collection activity

The  $\chi^2$  value of NTFP  $\chi^2=39.8$  also shows the statistically significant results between the degree of NTFP dependency and economic level of forest users. Table 8 shows that low economic status households engage in a high level of NTFP collection activities. Medium economic status households depend less on community forests for NTFP collection, and a similar situation also exists for high economic status households.



**Table 8:** Frequencies of non-timber forest products (NTFP) collection by households of different economic layer

Non-timber Products	LES		MES		HES		Total Observed
	Observed	Expected	Observed	Expected	Observed	Expected	
L	85	113.6	156	136.9	83	81.5	324
M	34	21.4	23	25.8	4	15.3	61
H	51	35.0	26	42.36	23	25.2	100
Total	170		205		122		485

$t^2=39.8$ , highly significant at 0.1% level

L, low degree of forest product collection activity; M, medium degree of forest collection activity; H, high degree of forest product collection activity

#### *Dependency According to Property Regimes Among Forest Users*

Except in the case of timber, our earlier findings show a statistically significant relationship between economic status of households and degree of dependency on forest products. In spite of a high degree of dependency for forest sufficient supply of forest products from the community forests has not been adequate. Local forest users fulfill their demand for forest products from alternative sources from the national forests and private-land trees. Therefore, in order to fully understand the issue of dependency of households for forest products, it is imperative to analyze the nature of the varying property regimes of forests. Our study evaluates the nature of property regimes of the forests of Nepal by examining community forests, national forests, and private-land trees.

These forest types represent the different types of forest property regimes presently existing in the district.

In a community forestry property regime, limited authority for forest management and utilization is transferred from the central government to local forest user groups. Members of forest user groups are allowed to make their own rules and regulations, based on the needs and priorities of local communities. However, the national forest is directly controlled and managed by government agencies, such as the Department of Forest and the Department of Wildlife Conservation, by using armed forces and punitive measures for illegal harvesting of forest products. In spite of the strict governmental regulations intended to protect national forests, illegal harvesting of forest products for fuelwood and timber is a practical reality in Nepal. Problems of illegal harvesting of national forests are further exacerbated by widespread corruption and bribery. Still, the government controls 79% of the total forest of Nepal. These forests have been depleting at an alarming rate (Sousan et al. not dated) because of existing poverty and unemployment in Nepal. In most of these cases, low economic status households are involved in illegal harvesting of national forests, since there exists no alternative means of survival in Nepal



**Table 9:** Grass and Fodder contribution from community, national forest and private land (percentage)

Forest User Group	Low Economic Status			Medium Economic Status			High Economic Status		
	Resource used from	Resource used from	Resource used from	Resource used from	Resource used from	Resource used from	Resource used from	Resource used from	Resource used from
	CF(%)	PL(%)	NF(%)	CF(%)	PL(%)	NF(%)	CF(%)	PL(%)	NF(%)
Kafle	17.0	21.0	0.0	19.00	56.0	0.0	3.0	90.0	0.0
Patle	24.0	17.0	0.0	34	61.0	0.0	10.0	88.0	0.0
Gomati	27.0	31.0	0.0	32.0	56.0	0.0	6.0	78.0	0.0

Source: Field Data

Demand for remaining percentage of grass and fodder is fulfilled by agricultural by products

**Table 10:** Fuelwood contribution from community, national forest and private land (percent)

Forest User Group	Low Economic Status			Medium Economic Status			High Economic Status		
	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)
Kafle	53.0	9.0	21.0	44.0	11.0	13.0	14.0	29.0	2.0
Patle	42.0	7.0	31.0	39.0	10.0	11.0	13.0	14.0	2.0
Gomati	67.0	19.0	5.0	59.0	16.0	9.0	23.0	29.0	3.0

Source: Field Data

**Table 11:** Bedding and litter contribution from community, national forest, and private land (percent)

Forest User Group	Low Economic Status			Medium Economic Status			High Economic Status		
	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)
Kafle	10.0	8.0	0.0	14.0	53.0	0.0	12.0	97	0.0
Patle	27.0	13.0	0.0	27.0	46.0	0.0	13.0	84.0	0.0
Gomati	28.0	5.0	0.0	30.0	55.0	0.0	7.0	90.0	0.0

Source: Field Data

**Table 12:** Timber contribution from community, national forest and private land (percent)

Forest User Group	Low Economic Status			Medium Economic Status			High Economic Status		
	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)	Resource used from CF(%)	Resource used from PL(%)	Resource used from NF(%)
Kafle	2.0	1.0	21.0	51.	2.0	13.0	54.0	1.0	19.0
Patle	21.0	2.0	10.0	62.0	2.0	13.0	67.0	3.0	10.0
Gomati	20.0	3.0	10.0	39.0	5.0	9.0	65.0	2.0	12.0

Source: Field Data

Marketable goods like iron rods and concrete blocks serve as a substitute to fulfill the demand for the remaining percentage of timber.

Private-land trees refer to trees grown by households on private land. For the most part, marginal lands, infertile lands, and lands adjacent to creeks and rivers are used for tree planting in Nepal. Systematic private forestry rarely exists in the study areas. Individual households or owners of land have planted substantial numbers of trees on private lands to meet the need for daily forest products. Land-owners are allowed to harvest forest products from the private-land trees but governmental permission is needed for the marketing of forest products, especially timber. The regimes of property rights are clearly defined on the behalf of landowners of private-land trees. Tables 10–12 examine the degree of forest products dependency by household and nature of the local forest property regime

#### *Forest as a Source of Fuelwood*

Despite various degrees of forest product dependency, all economic status households rely on fuelwood for their daily livelihood. Table 9 highlights the degree of dependency of households on different regimes of forest products. It shows that low economic status households rely significantly on community forests for fuelwood. Despite the high level of dependency of local forest users on community forests, the annual amount of fuelwood harvested from each community forest was not clear because of the unavailability of accurate information. This result, which was expected, arises because most of the low economic status households of the area are either landless or have small pieces of land which they cannot use for the planting of trees.

The forest user groups of Lalitpur were authorized to manage and utilize the national



forests after the implementation of the user group forestry concept of 1990 in Nepal (Bishnu Prasad Aryal, personal communication). On average, the community forests of Lalitpur supply 39 % of the total demand for fuelwood to local forest users. In the same time, national forests and private-land trees supply 15% and 11% of the fuelwood demands of Lalitpur, respectively. This analysis further shows that both low and medium economic status households collect a higher percentage of fuelwood from community forests. For low economic status households, the community forests supply approximately 54% of their total fuelwood demands. The remaining demand for fuelwood is supplied by national forests (14%) and private-land trees (1%). In contrast, medium economic status households collect 47.33% of fuel-wood from community forests, followed by private-land trees (12.3%) and national forests (11%). Similarly, high economic status households take 10.7% of fuelwood from community forests, followed by private-land trees (85.3%) and national forests (0%). The remaining demands for fuelwood by medium and high economic status households are met by alternative energy sources such as biogas and kerosene and in many cases the liquefied petroleum.

#### *Forest as a Source of Fodder and Grasses*

Collecting fodder and grasses was the second highest priority after fuelwood by the local forest users in the study area. The high demand for fodder and grasses comes from the fact that livestock comprises a major part of the farming system in Lalitpur. Table 9 indicates that private lands, followed by the community forests, supply the major amount of grass and fodder. The study reveals that under the community forestry project, forest user groups have adopted different rules and regulations to control the fodder and grass collection activities of its members, mostly depending upon the availability of grasses and

fodders. Out of the eight community forests studied, most of the community forests offer free access to their members for harvesting grasses and fodder. The results also show that households of low economic status take a higher amount of fodder and grasses from community forests than economically better-off households do.

#### *Forest as a Source of Litter and Bedding*

Livestock is an integral part of the farming system in Lalitpur. Successful agricultural farming requires a sufficient supply of plant nutrients. In the study area, litter and bedding materials offer the most viable alternative to chemical fertilizers. Generally, litter and bedding materials are scattered in the animal shed during the night to keep the farm animals warm and comfortable. In the morning, the used litter and bedding materials mixed with animal dung and urine are collected and piled up to make organic manure, which is a cheap source of nutrients for crops. Most of the farmers in the study area could not afford expensive chemical fertilizers and depend instead on organic manure for farming. Other uses of litter and bedding materials include control of excessive growth of weeds, maintenance of temperature for germination, and reduction of excess sun-light to nursery plants.

Table 11 shows that most of the litter and bedding materials come from private lands, followed by community forests and national forests. Medium and high-income status households meet their needs for litter and bedding materials mainly from the private lands (50% and 78.5%, respectively). However, the amount of litter and bedding materials collection seems to be different between the community forestries of the study.

### *Forest as a Source of Timber*

Although the forest policies of Nepal restrict commercial harvesting of timber in community forests, full autonomy was granted to community forestries to collect timber from the dead and fallen trees in community forests. Timbers are mostly used as poles, agricultural tools, and house construction materials. Therefore, each community forest of the study area has developed its own rules to control the harvesting of timber, a product in high demand (Table 12). The analysis shows the demand for timber as high, irrespective of economic status of households. In most of the community forestry programs, members have to pay some fees to collect timber for house construction purposes. However, timber was freely given to members of community forests following natural disasters.

### *Forest as a Source of Non-timber Forest Products*

NTFPs are important in the subsistence economy of peripheral parts. Most of the rural households collect NTFPs for day-to-day activities. The major NTFPs include reeds and thatch grasses. Herbs, medicinal plants, tree bark, creepers, wild fruits, wild vegetables. Collecting herbs, medicinal plants, and tree bark is prohibited in all community forests because of their economic value, while reeds, and thatch grasses were free for local households. It is reported that most of the households collect significant amounts of reeds, thatch grasses, creepers, wild vegetables, and wild fruits from community forests. The study shows that most of the high economic status households use fewer amounts of NTFPs than middle and low economic status households.

### *Conclusion*

This study examines the relationship between the degree of forest product dependency based on different economic status of households and different forest property regimes. This study shows that the economic status of households and property regimes of forest resources both have a marked relationship with the level of collection of forest products. In this analysis, the low economic status households rely heavily on community forests for most of their forest products. However, abundant harvesting of forest products is restricted by various regulations of community forests. Therefore, in many cases, poor economic status households are forced to illegally harvest forest products from the national forests, mostly for commercial purposes. These findings indicate that the medium and high economic status households rely on private land for many forest products, even though community forests remain very important, especially for medium economic status households. This high degree of dependency of medium status households on community forests has developed due to an inseparable relationship between forests and farming systems.

The analysis of different types of property regimes and degrees of forest product dependencies shows that local forest users derive a significant amount of forest products from community forests, followed by national forests and private-land trees. In the study, community forestry modifies the property regime of local forests by transferring authority of management and use of local forests from the central government to local forest users. Analysis shows that collection levels of forest products were much higher in community forests. This indicates that providing management and use authority of local forests to local communities ensures a higher level of forest products production. It ultimately increases

forest product supplies to local households. In addition, it might help to achieve the goal of sustainable management of forest resources in Nepal. This study has enough evidence to suggest that the dependency of households on forests is inextricably related to the economic status of local forest users and the property regimes of forests.

Besides these direct benefits from community forest management system, rural peasants are also benefiting through the institutional development of community forest in Nepal. These institutional benefits are also known as indirect benefits. These institutional benefits are the development of livelihood assets (social, physical, human, and financial capital) at the community level.

The community forest of the study area doesn't have benefits alone. It has negative sides too. Although CFUGs have been successful in terms of their institutional capacity to get people organized and form capital at group level, perhaps the most critical in terms of livelihoods and the relatively weak generation of financial capital for the forest dependent poor and women. While trends towards resource degradation have been arrested and in many cases forest cover is reported to be improved, the livelihoods of the local forest dependent communities, particularly the poor and disadvantaged, have not improved as expected. In worst cases, in fact, the implementation of CF policy has inflicted added costs to the poor, such as reduced access to forest products and forced allocation of household resources for communal forest management with insecurity over the benefits.

Furthermore, one of the major challenges underpinning the lack of financial capital for the poorest of forest users, relates to low social capital in FUGs, as well as FUG institutional arrangements and decision-making processes that reinforce those trends. Multiple stakeholders with differences in 'power' speak, voice and be heard differently. The poorest are

the ones who are suffered the most since they cannot afford to participate and hardly speak, are rarely heard and benefit from community forestry. Given the unequal social structure in terms of class, caste, gender and regional disparity, there is unequal access to decision-making, to opportunities, to contribute and to benefits. Although involvement of marginalized people in community forestry with their perceptions and actions have direct impacts on forest systems and their livelihoods, marginalized groups in multi-stakeholder settings have often been excluded and under-valued, with the perception that they have less ability to make and act on decisions. As a result, poor peoples' access to resources has been reduced, with consequent negative impacts on their livelihoods and on the condition of government forests in neighboring areas of community forests. Clearly this situation, intransparent decision-making and fund management reflect weak FUG level governance in many cases.

Furthermore, it has been increasingly recognized that inequitable distribution of benefits, combined with uneven sense of ownership and motivation in the FUGs, and lack of clear options, as well as technical knowledge (and some policy implementation constraints) have resulted in relatively 'passive' managements of forests. While forests have been generally well protected, it seems increasingly likely that the majority of FUGs are not utilizing their forests to their full potential in terms of income generation. Leadership positions on community forest user groups and among other stakeholders are typically captured by power elites, and their management systems are somewhat rigid and top-down. Since they have weak monitoring systems, they make decisions without adequate information and even if they have information available, they are slow to make the best use of the new information for making decisions. This also reflects a lack of human capital in terms of knowledge and skills (and incentives) to undertake successful participatory decision-making in highly heterogeneous

environments, as well as to generate and apply necessary forestry and institutional knowledge.

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## APPENDICES

### *Appendix I: Questionnaire for Household survey*

Questionnaire for household survey  
Lalitpur District, Nepal

Name of respondent:

Name of Community Forest:

Date:

VDC:

Ward No:

#### **1. Demographic data**

Sex:                   a) Male  
                          b) Female

Caste/Ethnicity:

Marital Status:     a) Married  
                          b) Unmarried  
                          c) Widow

Wealth rank:           Rich                                   Medium                                   Poor

Level of Education:

- a) College
- b) Secondary
- c) Primary
- d) Illiterate

Occupation: a) Infant  
                  b) Student  
                  c) Agriculture  
                  d) Service  
                  e) Business  
                  f) Pension  
                  g) Others

## 2. Information about Community Forestry

2.1 How far is the community forest from your place?

1. Up to 15mins-----
2. 15 to 30mins -----
3. More than 30mins----

2.2 How often do you visit to collect CF products?

CF products	Daily	Weekly	Monthly	Yearly	Remarks
Grasses					
Fodder					
Leaf litter					
Fuel wood					
Timber/ Poles					
Others					

2.3 Collection and utilization of forest products

Forest products	Quantity (Annual) (Doko/Bhari)			Cost (Annual fee, harvesting fees)	Time spent
	CF	NF	PF		
Grass					
Fuel wood					
Fodder					
Leaf litter					
Poles					
Timber					
Others					

*CF: Community Forest, NF: National Forest, PF: Private Land*

2.4 Please specify the amount of CF products used for own consumption, livestock rearing and crop production.

Forest products	Own consumption	Livestock management	Crop production	Remarks
Grass				
Fuel wood				
Fodder				
Leaf litter				
Poles				
Timber				
Others				

2.5 Are you satisfied with the CF products distribution process?

Yes ( )                      No ( )

Why? \_\_\_\_\_

2.6 Is there any improvement after establishment of CF in availability of forest products? Yes ( )                      No ( )

If yes how? \_\_\_\_\_

If no how? \_\_\_\_\_

2.7 Do you collect poles/ timber to make agriculture tools (spade, plough etc)? Yes                      No

If yes, please specify the source, amount and cost of collection.

Source	Quantity	Cost of collection	Remarks
Community Forest			
National Forest			
Private Forest			

2.8 How do you use the forest products in crop production?

Products	Method of use	Remarks
Fodder		
Grass		
Leaf litter		
Poles		
Timber		
Others		

2.9 Do you use poles/timber for construction of livestock shed?

Yes                      No

If yes, Please specify the source, amount and cost of collection of these products.

Source	Quantity	Cost of collection	Remarks
Community Forest			
National Forest			
Private land			

3.0 How do you use the forest products?

Products	Method of use	Remarks
Grass		
Fodder		
Leaf litter		
Fuel wood		
Poles		
Timber		
Others		

6. Other relevant information if any.

---

*Appendix II: Questionnaire for Committee members/key informants*

1. Name of the Forest User Group: \_\_\_\_\_

2. Name of Forest User Group chairman: \_\_\_\_\_

3. Number of Households: \_\_\_\_\_

4. What is the composition of Users' committee?

On the basis of Gender

No. of Male

No. of Female

On the basis of Wealth class

Representation of each wealth class

Members from Wealth Class 1:

Members from Wealth Class 2:

Members from Wealth Class 3: On

the basis of caste/ethnicity: On the

basis of education:

5. Type and condition of forest/Area: \_\_\_\_\_

6. What management activities are you doing within community forest?

6.1 Plantation (e.g. Cost sharing, Labour) \_\_\_\_\_

6.2 Protection (e.g. Fencing, Forest guard) \_\_\_\_\_

6.3 Silviculture practices (e.g. thinning, pruning)

6.4 Utilization (e.g. Harvesting, Distribution pattern) \_\_\_\_\_

7. Outside support/Linkage: \_\_\_\_\_

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10. How is the time of extraction of CF products decided?

- a. Community consultation ( )
- b. Committee decision ( )
- c. Others ( )

11. How is the method of distribution of CF products decided? (Prioritization of households and amount).

- a. Community consultation ( )
- b. Committee decision ( )
- c. Others (Specify) ( )

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*"Thank you for your support"*

*Appendix III: Checklist or Issues for Group Discussions*

1. Map of the community forest showing the major forest species
2. Type and condition of forest/Area
3. Major Activities done to support agricultural farming through Forest User Groups
4. Preferences for the species by the group members
5. Wealth ranking for the Forest User Group members (For sampling purpose only)
6. Perception of the groups towards contribution on Agricultural farming from community forest (specifically in terms of crop production and livestock management)
7. View of the groups towards Gender role in farming systems (specifically in terms of crop production and livestock management).
8. How are community forest products used by the rural households to support their agriculture farm?
9. What are the major constraints of Community Forestry? (Problems faced by FUG members in CF)