Impacts of Community Forestry Development on Livestock-Based Livelihood in Nepal

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Abstract

The paper examines changes in livestock farming associated with community forestry (CF) in Nepal. Based on surveys of 259 households from 6 community forest user groups (CFUGs), and a survey of 64 CFUGs in three mid-hill districts in Nepal, the paper concludes that forage production and availability has decreased with the commencement of CF programs. This paper challenges the assumption that improved forest condition necessarily leads to improvement in livelihoods of the farmers.

Keywords: community forestry, fodder, livestock, poverty, rural development

INTRODUCTION

Forest development for both environmental conservation and rural livelihood support is frequently advocated in contemporary development. Community forestry (CF) is a decentralized concept, which has been practiced in Nepal for about 25 years. CF development has had a number of positive impacts including active participation of local people in community forest development (Varughese and Ostrom 2001), formation of more than 13,000 CFUGs within 12 years (National database 2003), restoration of tree stocks (Gautam *et al*. 2002), and increase in local funds that can be used for community development (Dangol *et al*. 2002).

Despite this achievement, a number of recent studies indicate that CF development has created limited benefit to poor people and women (Timsina 2003; Agarwal 2001). One of the challenges is to promote livestock along with community forestry development. Livestock has a key role in providing a livelihood and reducing poverty for subsistence farmers in mountain areas (Fafchamps and Shilpi 2003; Bhatta 2002). Livestock business does not only help in securing social and environmental stability but also provides stable employment that is vital for income generation and food security.

Women have got hard time to manage forage need for their livestock (Brown and Shrestha 2000). Timsina (2003) found that even when fodder is available, challenges exist as regards how equitable distribution can be achieved. The restricted period of availability of forage for daily needs from CF has often made it difficult to maintain their livestock. As a result, they are forced to violate community rules to supplement the fodder and in some cases they end up paying fines. Adhikari *et al.* (2004) and Richard *et al.* (1999) report that poor households' access to forage is reduced following the establishment of CF. A number of studies have shown a decline in livestock numbers or changes in the composition of livestock holdings with the commencement of CF program (Bhatta 2002; Gentle 2000; Fox 1993).

The purpose of this paper is to evaluate the changes in livestock farming after CF development. Specifically the first task is to determine whether there are reductions in livestock holdings after the commencement of CF programs. The second is to look at the causes of reductions, if any, in livestock holdings. Most of the previous studies have raised the issue of livelihood-related problems as part of small, exploratory case studies, or were mainly focused on examining net benefit distribution across households (equity). This paper focuses on livestock related livelihood impact of CF capturing evidences from three middle hills districts of Nepal.

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METHODS

In order to study changes in household income and livestock holdings as a result of implementing CF programs, surveys were completed in 259 farming households in six CFUGs of Dolakha, Kavre and Nuwakot districts. Kavre and Dolakha are among the districts in which CF program was initiated two decades ago, and these districts are relatively accessible for monitoring by donors and government agencies. The CFUGs were selected on the basis of forest conditions, type of foraging practices, age of the CFUGs, forest size and some level of access to district forest office services.

The household samples were selected considering geographical locations, ethnicity and living conditions of the population. A semi-structured questionnaire was used in May-July 2003 to female heads of the households. The respondents were asked to report their number of livestock they were holding at the survey time and to recall the number of livestock before commencement of the CF program. Households were also asked whether they would increase their livestock holding provided forage availability increases from CF.

Data from a total of 213 households were analyzed. The general characteristics of the CFUGs selected for household survey are shown in Table 1.

Table 1: The general characteristics of the groups

	Dolakha district*		Kavre district*		Nuwakot district	
Forest User Groups	Khorthali	Siddeshwari	Chapanigadi	Banshkharka	Panchak-Bidur	Panchak-Suryamati
Forest Area (ha)	168.50	99.94	89.90	23.00	116.00	37.50
Total households in the group	548	272	105	57	199	94
Grazing practice	Restricted	Restricted	Restricted	12 months free	12 months free	Restricted
Ground grass collection	Specific time	Specific time	Specific time	12 months free	12 months free	12 months free
Forest species dominant	Pine	Broad leaf	Pine	Broad leaf	Broad leaf	Broad leaf
Group selection criteria	Closest to DFO and pine forest	Broadleaf, relatively low input of project and DFO	Pine and high input from project and DFO	Broadleaf, relatively low inputs	Closest to the DFO	Away from DFO
Forest handover (year)	1993	1999	1990	1992	1995	1995
Sample size	32	31	36	39	38	37

Note: *Some households are members in more than one CFUGs.

Similarly, 64 CFUGs (approximately 20 CFUGs from each district) were surveyed to identify their production and distribution practices of fodder products. CFUGs representatives were also asked about their experience of fodder production changes in their community forests.

Discussions at individual level were held with 9 officials from the government and bilateral projects involved in CF program implementation (districts) and policy decision (central) levels in order to understand their awareness and interest related to the problems of CF program in general and the relation of the livestock- CF in particular.

RESULTS

Results about the problems of CF programs to support livestock based livelihoods and impacts of CF are explained in the sections as below. The results are interpreted and discussed in the second subsection.

Forage and Leaf Litter Utilization Practices

Table 2 shows current forage and leaf litter utilization practices in the CFs. More than 50 percent of CFUGs open their CF for less than 3 months in a year for fodder and ground grass collection in Kavre and Dolakha districts. In Nuwakot district, forestland is open for grazing throughout the year. In Dolakha, the results show that more than half of the CFUGs distribute tree fodder, while the practice is uncommon in Kavre and Nuwakot districts. It is interesting to note that tree fodder has been limited or has zero supply from the CF in many groups. Results also indicate that only in the few groups, there is a restriction in collecting grass throughout the year. These results are consistent with many studies (Timsina 2003, Agarwal 2001; Brown and Shrestha 2000). Despite increasing demand from users, leaf litter was not distributed in a number of CFUGs in Nuwakot district.

Table 2: Ground grass collection, tree fodder distribution and grazing practices in community forests (parentheses indicate percent of groups)

Products/ services	Practices	Dolakha (N=21)	Kavre (N=23)	Nuwakot (N=20)	Total (N=64)
Grass collection	One month and less	6 (29)	10 (43)	1 (5)	17 (27)
	One month to 3 months	4 (19)	2 (9)	1 (5)	7 (11)
	More than 3 months	6 (29)	5 (22)	4 (20)	15 (23)
	All seasons restricted	0	1 (4)	3 (15)	4 (6)
	Provided to highest bidders	0	1 (4)	1 (5)	2 (3)
Grazing	Whole year free grazing	5 (24)	4 (17)	10 (50)	19 (30)
	Partial area grazing	3 (14)	0	0	3 (5)
Tree fodder	Collection practiced	11 (52)	1(4)	3 (15)	15 (23)
Leaf litter	Restricted collection on demand*	0	0	5 (25)	-

* Note: Termite problem of some localities limits the demand for leaf-litter (one group from Dolakha and another from Nuwakot district had no demand for it, these groups are excluded from the analysis). In Nuwakot district, one group has not opened the forest to collect leaf or twigs for ten years, though some members have severe need of the forest products.

The Changes in Foraging Practice and Forage

The CFUG representatives' experience about changes in fodder and grass supplies from the CF shows that the supplies of forages has decreased in Kavre and Nuwakot districts, and increased in the Dolakha district. Similarly, response of users to a question "How will fodder and grass production in your CF increases if you continue current forest management practices?" was also analyzed. The analysis indicates that fodder production is expected to decrease further in many CFUGs and will decrease most in Kavre district if the current practices are continued. Kavre district has a long history of induced community forest management with external support and the CFUGs have undertaken some silvicultural operations. Many CFUGs of the district are experiencing decreased fodder production and further decrease is also expected in near future. The forests have relatively mature stands that have suppressed the ground grasses and the regenerations. The CFUGs in other districts may reach similar condition in the near future except in the groups that have sufficient fodder trees and forest area maintained for ground grass production.

In Nuwakot district, many CFUGs have not applied silvicultural practices. Even firewood has not been distributed regularly in more than 50 percent of the sampled CFUGs. In some CFUGs, the use of woody material from CF is completely restricted for many years. The restriction on the collection of leaf litter along with above mentioned forest products supports the notion that CF is strictly protected. However, forage products may decrease further in Nuwakot district because of increasing tree canopies that suppress the forage yield. Because of suitable climate to grow tree fodder naturally in forests in Dolakha district, many CFUGs in the district have expectation of fodder increment in future.

Based on the type of common foraging practices and the impact on livestock holdings, the rate of decrease could be more in Dolakha and Kavre districts than in Nuwakot district. Donor-funded projects have worked more intensively in both Kavre and Dolakha districts than in Nuwakot. It indicates that the information and advice provided directly by development workers could significantly change the perception and practices of Nepalese rural people. It also shows that the external agents working in donor projects put great emphasis on industrial model of forest management than the multiple use forestry, which is compatible with the needs of the poor and women.

Livestock Changes

Table 3 indicates that all types of livestock units have decreased after the introduction of CF programs. Khorthali, Chapagadi and Siddeswori CFUGs show the significant changes in goat numbers. The buffaloes decreased in the Khorthali, Chapagadi and Panchkanya-Suryamati, but interestingly, increased in the Banshkharaka CFUGs. Cattle decreased in all groups except Banshkharka and Panchkanya-Suryamati.

Table 3: Dynamics of livestock holding of household before and after CF program

	Time	Dolakha district		Kavre district		Nuwakot district	
		Khorthali	Siddeswori	Chapanigadi	Banshkhraka	Panchkanya-Bidur	Panchkanya-Suryamati
Cattle unit	2003	1.20	1.71	1.53	1.63	2.18	2.22
	Before CFUG	2.77	2.60	2.86	1.86	3.75	2.38
	t test	3.37*	2.47*	2.87*	0.85	2.94*	0.80
Buffalo unit	2003	0.95	1.23	1.33	1.14	0.74	1.15
	Before CFUG	1.83	1.63	2.27	0.23	1.01	1.50
	t test	2.30*	1.61	2.86*	2.92*	1.04	2.03*
Goat unit	2003	3.50	3.47	4.69	1.67	1.95	3.41
	Before CFUG	6.27	5.63	6.70	1.96	2.38	3.54
	t test	3.95*	4.21*	2.74*	1.31	0.70	0.34
Respondents willing to increase livestock holding (%)		50	51	56	88	56	37

Note: * significant values for *t* test of a pair sample at 0.05 probability level. One tail *t* critical value is 1.688

The last row of the Table 3 indicates the percent of respondents willing to increase livestock holding if the fodder availability increases in their community forests. Among the respondents, 72 percent of Kavre, 50 percent of Dolakha and 46 percent of Nuwakot districts replied that they would increase their livestock holding if the fodder and grass availability increases.

We found decrease in the number of goats in many households in all groups, while buffalo and cow holdings are stable or slightly decreased. Not all the households experience decrease in all animal numbers but in a few households, there was a shift from goats to large animals (cow and buffalo). In contrast to other groups, buffaloes increased in many households in the Banskharka CFUGs. Before CF, goats and cows were allowed to graze in the forest (Mahat *et al.* 1986). The change in the goat unit as well as the number of households with decreasing goat is both significant. It is unlikely that the changes in the goat numbers is due to regular fluctuations characterize to dynamic resource system. Our inference is that the goat business is negatively affected by CF program.

Household survey record carried out during Khorthali group formation shows that the CFUGs had a total of 1,372 goats, and 1,135 cows and buffaloes in 1993. The updated household survey shows that there are 814 goats, and 1669 cows and buffaloes in 2002. During this period, the human population increased from 2,825 to 3,144 people[1]. Mahat *et al*. (1986) from the study of Chapanigadi (the village called Chaubas) groups have found larger number of livestock unit holding (average 10.5 units) than the households of other hills (5 units) in 1982-83 survey when the forest area was largely a shrubland with grasses. Now the livestock holding has been largely decreased. This type of historical record was not available for other groups.

The decrease of animal numbers seems to be associated with forest condition and use practices. For example, the Khorthali and Chapanigadi CFUGs have pine-dominated forests planted by the government. These forests have been overstocked with grown up trees with little room for grasses, fodder trees and areas for grazing. The results here are consistent with Adhikari *et al.* (2004) who found that users get little forage from pine forests. The Siddeswori CFUG has broad leaf forest. Grazing of goats and cows in the forest was common for more than half of the households of the Siddeswori CFUG before the CF program. This practice has been restricted after CF program commenced in the community.

There is a smaller impact of CF on livestock holdings in groups that have more access to animal feed. For example, Banshkharka CFUG members have access to a large area of mixed forests and are practising free grazing and grass collection all round year (most of the households have use rights in 3 community forests), and the group has access to a permanent road. This is a commercial vegetable farming based community with improved buffalo holdings. These animals can be sustained with purchased or stored feed. Thus the number of households with large animal holding may have increased. This scenario is consistent with Brown and Shrestha (2000). This Banshkharka CFUG has access to large forest areas including other two forests. Still most of the households want to increase their livestock provided increase of fodder supply. This indicates the CFUG has not managed its forests to address the fodder need of the users.

The Panchkanya-Suryamati CFUG has broad leaf forest, a high forest area to household ratio, restricted grazing in the CF, and open forage collection throughout the year. As a result, relatively larger animal holdings could be sustained after the start of the CF program. In the Panchkanya-Bidur CFUG, a significant number of households had no holding of any type of livestock before CF

[1] Because livestock is the principal source of farm manuring and farm resources for labour and forage utilisation each household keeps some animals in rural areas. The livestock numbers increases generally with increasing household numbers of the group.

although they have farming based livelihood. A large part of their forest is predominantly a broad leaf forest, where grazing of the animals and green grass collection is free throughout the year.

The access to alternative fodder could also be a reason for the differences in livestock population changes. During the dry season, fodder is scarce. Rice straw, which can be used as fodder in the dry season, is more available in Bansh kharka, Panchakanya-Bidur and Panchkanya-Suryamati. However, national statistics shows that the cattle population has been decreasing nationwide. Therefore, fodder availability is not the sole reason for the decrease in hill cows. In rest of the CFUGs, the changes are obviously associated with changes in forage availability.

CONCLUSION

The fundamental challenges associated with CF are insufficient production of, and restricted access to, forage, which is a basic need of the farmers. Despite an increase in green stock in the forests, the impact of the current management of CF is negative to the livestock population. This study indicates that the changes in forest management institutions have also reshaped the forage supplies and livestock population and thus the economy of the resource dependent people in the rural society. The forage product has been decreasing in community forests, which indicates that livestock population could decrease further in future.

This finding contrasts with the argument that the farmers lose their animal feed after deforestation, which is commonly found in environment literature (Barraclough and Ghimire 1995). Furthermore, the result of decrease in livestock numbers after conservation of forest through CF intervention indicates that noted deforestation during 1970s-80s had actually some role in the expansion of livestock numbers in that period. Indigenous animals are adaptable and could thrive easily on the grasses and other vegetation grown naturally as a succession of deforestation. A noteworthy message for those who emphasize environmental conservation is that accumulation of green stock or improvement of forest stand does not necessarily benefit people in subsistence agriculture.

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