

From Forests to Food Security: Pathways in Nepal's Community Forestry

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Abstract

There is an increasing recognition of the contribution of forests to food security of poor and marginalized people. However, empirical findings remain limited on how forests contribute to food security. Drawing on four case studies of community forestry in Nepal, this paper discusses pathways through which forests are contributing to food security needs of local communities. The evidence presented here was gathered through four years of action research and draws insights from the past 40 years of Nepal's community forestry practice, which is often regarded as a successful case of conservation and development. It is shown that, there are four distinct pathways through which community forests contribute to food security as a source of: 1] income and employment; 2] inputs to increase food production; 3] directly for food; and 4] renewable energy for cooking. Despite emerging pathways linking forest management to food systems at the local level, forestry policies and institutions have neither explicitly recognized nor strengthened the linkage between forest and food security. The paper highlights that there is a need for a fundamental shift in thinking from the conventional notion of 'forests for soil conservation' to 'sustainable forest management for food security'.

Keywords: Food security, forest management practices, forest policy, forestry institution, livelihood

Introduction

Forests have been closely associated with the food security needs of the global rural population. This has been affirmed by the recent global assessment report 'Forests, Trees, Landscapes for Food Security and Nutrition' published in 2015 by the International Union of Forest Research Organizations (IUFRO). The report emphasizes the relationship between forest management and food security, highlighting findings that much of the potential of forests in contributing to reduce global hunger has not been realized. The report states that:

... food from forests and tree-based systems is likely to continue to form an essential part of household strategies to eliminate hunger and achieve nutritionally balanced diets. Unfortunately, there is little current appreciation of the diverse ways in which these tree-based landscapes can supplement agricultural production systems in achieving global food security amongst the international and national decision-making communities (Vira et al. 2015: 15).

The role of forests in enhancing food security is important because more than 1 billion poor people live in or near forests (Agarwal et al. 2015). With limited entitlement to private land, the poor are left with little choice but to continue relying on communal forests for their livelihoods. In this context, the IUFRO report (Vira et al. 2015) following Amartya Sen's entitlement approach (Sen 1983), has rightly argued for a shift beyond production-centric to an access-focused approach in managing forest and agroforestry resources. As most of the forests in developing countries are either state controlled (Agarwal et al. 2015), or communally managed, the debate on the role of forests in addressing food security of poor and marginalized people has gained traction, especially in the context of community-managed forests (FAO 2013). The debate has been sparked in part by studies which have shown that, despite a marked increase in global food production in recent years (Godfray et al. 2010), more than 1 billion people still do not have sufficient food (Barrett 2010). While most of the food security debate is centered on problems pertinent to agricultural production (Tester and Langridge 2010; Gregory and George 2011), the forestry sector remains at the periphery of such debate (Bharucha and Pretty 2010).

Nepal is a primarily agrarian country with over two thirds of its people relying on farming. However, food insecurity is a widespread problem. Only one fifth of the land is arable, over 50% of farmers have less than 0.5 ha of farmland, and over a quarter of households are functionally landless (CBS 2011a). The problem underlying food insecurity revolves around insufficient production as well as inequitable access to food (FAO 2010), the latter being linked to the limited and often inequitable access to productive land (Adhikari 2006). Alongside these central processes driving food insecurity in Nepal, there is also a lack of appreciation of other food-enhancing resource systems including forests, which could potentially alleviate food insecurity (Adhikari et al. 2016). The marginal position of forestry in food security debates is particularly visible in Nepal where government forestry policies and agencies perceive efforts to achieve agricultural production and food security as having negative effects on forest ecosystems (Dhakal et al. 2011; Paudel et al. 2014; Khatri et al. 2016;).

Nepal introduced community forestry in late 1970s after the failure of a centralized and bureaucratic approach to forest conservation (Hobley 1996; Guthman 1997; Springate-Baginski and Blaikie 2007). The community forestry program received strong policy, legal and institutional backing as well as strong support from development partners, civil society and forest users. Today, almost 40 % of citizens are involved in managing over 1.9 million ha of national

forest through over 19,000 user groups (DoF 2015). Apart from substantial improvements in forest conditions (MoFSC 2013; DFRS 2015) community forestry has made significant contributions to local livelihoods and institutional development (Kanel and Niraula 2004; Pokharel et al. 2007; MoFSC 2013; Nightingale and Sharma 2014). However, others have questioned its contribution to food security (Thoms 2008; Ojha et al. 2009; Dhakal et al. 2011; Khatri et al. 2016). It is therefore important to understand whether community forestry contributes to food security at all. And if it does, what are the diverse pathways of such contribution so that these can be supported to better promote the food security benefits of forest management.

Community forestry in Nepal is particularly interesting case to explore the potential role of forests in food security for at least two reasons: 1] local communities have direct access to manage as well as utilize forest resources for livelihoods (Paudel et al. 2009); and 2] forests in the hills of Nepal are an integral part of the agriculture-based livelihoods systems (Gautam et al. 2003). While Nepal-based studies have highlighted the role of forests in livelihoods (Pokharel et al. 2006; Adhikari et al. 2016; Khatri et al. 2016), the linkage of tree systems with food security is not adequately explored (Agarwal et al. 2015). Moreover, in the absence of land ownership, poor farmers rely heavily on community forest for their food security. Unfortunately, this is not recognized by a rather conservationist ideology of the forest officials, and forest policies do not mandate agencies to address food security needs through forestry in Nepal.

Recognizing this knowledge gap, this paper aims to establish the contributions of community forest to food security needs of the poor. In doing so, the paper identifies and explains pathways through which community forestry contributes to food security. Three key questions are addressed: 1] What are the development pathways that link community forestry and food security?; 2] What are the existing community forest management practices that support or constrain the pathways?; and 3] Which policies and institutional factors shape those pathways? This is achieved through analysis of four case studies and reviews existing forest policies and regulations. A key aspect of the analysis is to explore the ways in which institutions, at both the local and national levels, operate and facilitate (or hinder) the pathways that link community forestry with food security.

Analytical Framework

This paper adopts the Food and Agriculture Organization's (FAO) definition of food security (FAO 2006: 1) which states that "food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meet their dietary needs and food preferences for an active and healthy life". To demonstrate the linkage between forests and food security, the concept of 'pathways' as defined by Pender (2004) in his notion of 'Development Pathways'. In this definition, 'pathways' are defined as patterns of socio-economic change bridging common pool resources (in this case community forests) with food security outcomes. While pathways certainly apply to various levels –individual, households and communities (Pender 2004) – the focus on pathways mainly deals with the linkages between forests and food security at the communal level, taking community forest user groups as a case.

Four pathways have been identified through which community forests contributes to food security in Nepal:

- a) Forests as a source of income and employment, providing means for managing food.
- b) Forests as inputs (leaf litter, fodder), increasing food production.
- c) Forests as a source of direct food, providing means of daily diet.
- d) Forests as a source of readily available renewable energy, converting food into consumable forms.

These pathways are presented through local-level illustrative cases. However, the analysis also takes into consideration the context involving social, economic and environmental change in which communities and institutions are embedded, and the ways in which different knowledge systems shape national policies and practices. The four pathways demonstrate that the contribution of forests to food security are diverse, and that knowledge systems, policies and institutions play vital roles in the ways in which local communities adopt forest management strategies that contribute to food security. Figure 1 shows the pathways linking community forests to food security and the contextual factors that shape the linkage.

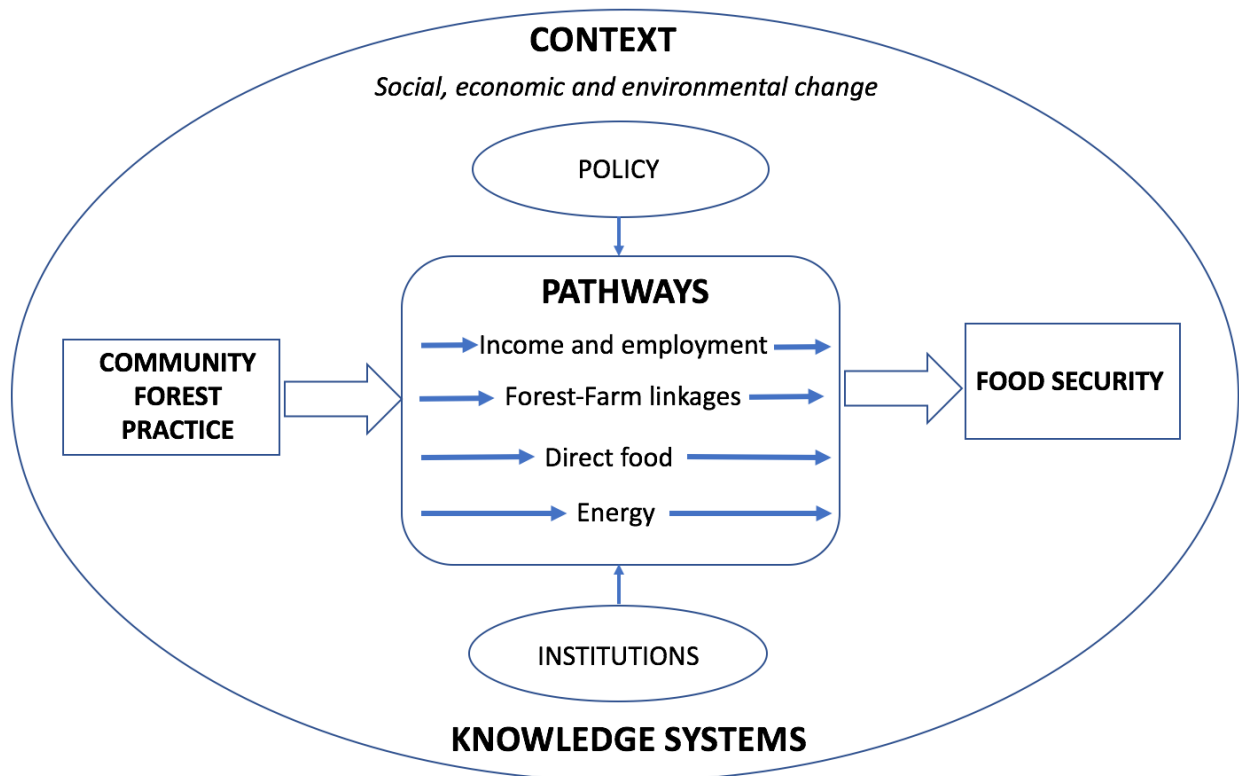


Fig. 1 Pathways linking community forests with food security

The Study Site

The research was conducted in four districts of Nepal indicated in Figure 2. People in these districts rely on forests for products particularly timber, fuelwood and non-timber forest products

(NTFPs). The four cases were purposively selected on the basis of their distinct contributions to food security. The cases represent diverse geographical conditions. The first case comes from Dolakha, a mountain district, and demonstrates evidence of community forests generating income and employment. The second case is from Kavre, a hilly district, and illustrates the forest as a source for farm inputs. The third case, of the forest as direct source for food, is taken from the eastern Terai district of Morang where the wild fern is harvested for food. The fourth case is drawn from Nawalparasi in the western Terai region, where the CF supplies fuelwood to the local communities.

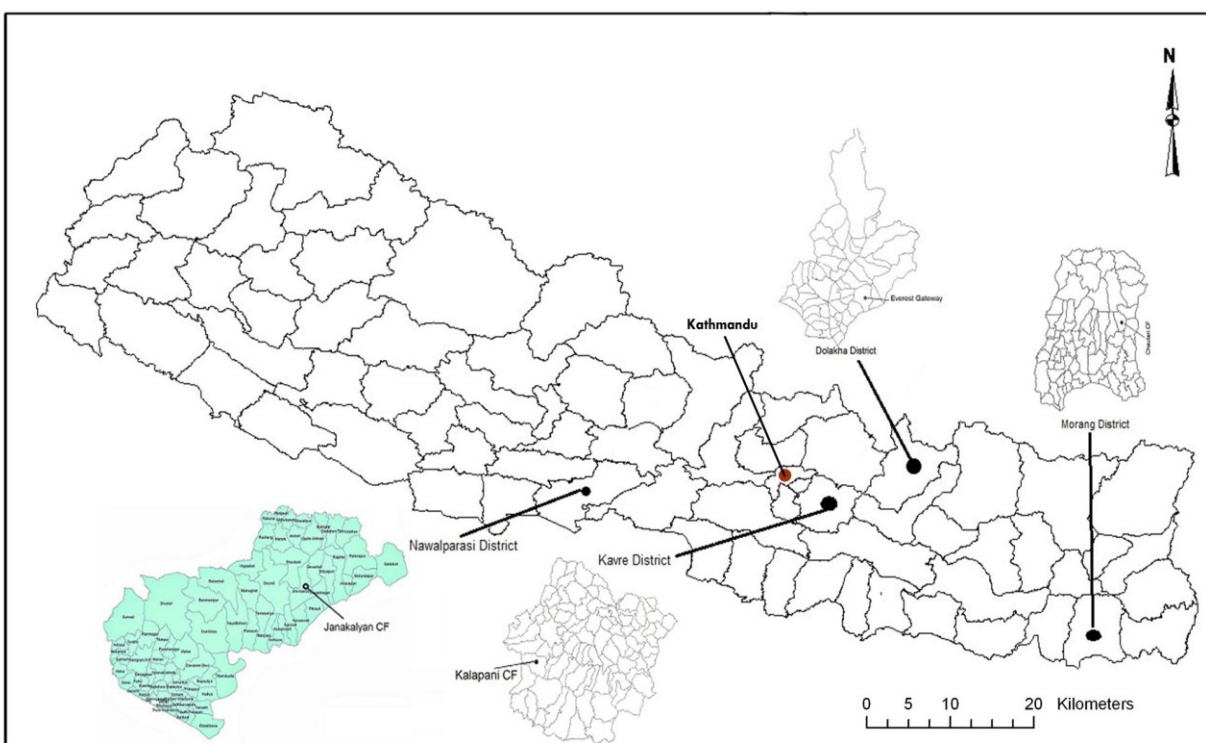


Fig. 2 Map of Nepal, with case study districts and sites highlighted

Research Method

The findings reported in this paper combine a review of literature and empirical cases from the field. The mapping of four pathways linking community forests with food security was based on the research engagement of ForestAction Nepal in the last past four years. About 50 sites with previous engagement were mapped to identify diverse linkages between community forestry and food security. Clustering of the patterns showed that there are primarily four ways in which the community forest-food security link is apparent. Prior to the field research, about 50 empirical research papers and reviews on community forests linking to food security, livelihood, income generation and livestock promotion were selected. From those, 30 references on CF contribution to food security were critically reviewed. Also, reviews of the forest policy documents – *Forest Act 1993* and *Forest Regulation 1995* – were carried out. This was complemented by review of the management plans and annual reports of four community forest user groups (CFUGs), particularly focusing on the rules pertinent to food security.

In total, 14 interviews were conducted with the CFUG members, forest office staff of the four districts, and leaders of the Federation of Community Forestry Users Nepal (FECOFUN). At the site level, about eight community leaders (particularly political party leaders) were interviewed. Four focus group discussions (FGDs), one on each CFUG, were held with identified food insecure groups (mainly involving poor farmers and marginalized groups). Transect walks around the forests and settlements were conducted to observe the everyday forest-people interactions. Three interactive workshops and seven bilateral meetings among the co-authors were also held to develop the framework and conceptual elements for analysis of the empirical data.

Analyzing Community Forestry Practice in Nepal: Four Pathways for Food Security

Enhancing income from enterprise development

The processing and sale of forest products and services is one of the major ways in which community forests contribute to food security. Various forest-based enterprises have contributed to income and employment of local communities, especially of middle-income and poor groups (Pokharel et al. 2006; MoFSC 2013). A study by Paudel et al. (2014) show that the community forest can generate over NRs 27 billion (i.e. USD24.7 million¹) and 21,710 full time jobs annually in Nepal. Similarly, NTFPs can generate over 87,259 full time jobs even in a conservative scenario (Subedi et al. 2014). A survey of 152 households in middle hill districts of Nepal found that 81% of households generated income through NTFP sales (Pandit and Thapa 2004).

Everest Gateway Company in Jiri (Dolakha district) is a typical case to illustrate the contribution of forests to income and employment. Established in 2003, the Everest Gateway (company henceforth), is a paper processing company established in a joint partnership between seven CFUGs. In addition, there were local investors, and private entrepreneurs who had invested in the company. It produces paper, often called *Nepali paper*, from locally available plants including Lokta (*Daphne bholua*) and Argheli (*Daphne papyracea*). The company is a collaborative initiative of seven CFUGs in Jiri and contains four types of shareholders - CFUGs (30% share), 126 identified poor households from those CFUGs (25% share), local entrepreneurs who are also members of the CFUGs (25% share) and private external entrepreneurs (20% share). The Nepal-Swiss Community Forestry Project supported establishment and operation along with buying the share of the 126 households in the company. The District Forest Office (DFO) provided training on sustainable forest management practices, while FECOFUN facilitated the entire process of establishing the company.

¹ 1 USD = 109.75 NRs as of 30 November 2016

Currently, the company employs seven full-time and 40 part-time. The poorest members of the CFUGs, based on a ranking of wellbeing, are prioritized for employment. The pay rate is NRs 300-500 per day (USD 2.70-4.50/d), which is average in the village context of Nepal. Similarly, the CFUGs also earn 9 NRs per kg (USD 0.08/kg) as the royalty of collected raw materials. The company processes 15-16 tonnes of Lokta and Argheli every year with a total processing cost of about NRs 1200-1500 (USD 10.90 – 13.60). The CFUGs benefit from the dividend based on their share in the company.

The company has been facing two major challenges: getting a permit from DFO to sell forest products in the market involves high transaction costs, and the level of support from the DFO has been declining in recent years, affecting the functioning of the company. This is supported by the claims of the local members who think that the support from DFO during the initial days was critical in the establishment of the company, but the DFO staff appear to be less interested in providing support to the company nowadays.

This case demonstrates the community forest as the resource base for forest-based enterprises that generate income and employment. There are enormous opportunities to upscale such initiatives so that community forestry can substantially contribute to income and employment. While a daily earning of USD 3-5 per day is not a high income, it has played a critical role in complementing household incomes for the poor and marginalized rural Nepalese households who lack access to more lucrative livelihoods.

Forest-farm linkages

A forest-farm interface is embedded within the rural agrarian economy in Nepal. Agriculture is still the backbone of the economy, the country relying heavily on forest products and services including sawlogs, fodder, and conservation of soil and water resources (Mahat 1987; Thapa and Weber 1995; Marquardt et al. 2016). Livestock rearing is another component contributing to agricultural output in Nepal. The major livestock currently raised are cattle (7.24 million head), buffaloes (5.17 million), and goats (10.17 million) (CBS 2014). Livestock have been regarded as a key source of cash and contribute to household incomes for the poor in isolated mountain communities (Riethmuller 2003). Even in the Terai, about 55% of the households rely on plough-based agriculture (CBS 2014). Similarly, about 2,700 metric tons of organic manure per year are used for agriculture (CBS 2014), most of which comes from manure from animals fed fodder from the forests.

The case of the Kalopani community forest of Kavrepalanchowk district is a good illustration of how forest-farm linkages function. The forest has 278 households, almost all relying on agriculture. Maize, mustard, wheat, and barley are dominant crops in the area. In addition, livestock serves as the major source of livelihood. In total, there are 142 cows, 411 buffaloes, and 812 goats in Kalopani. The village has a thriving dairy enterprise. Out of 278 households, 220 sell milk to the two dairy centres in the village, and five households produce *khuwa* (milk

curd) and sell it in the village market. On average, an individual household makes NRs 5000 per month (USD 50 /month) solely from the sale of milk and milk products, contributing 25% of the household income. The rest is generated from vegetable farming and off-farm businesses including local shops.

Various schemes have been introduced by the CFUG to promote livestock. For instance, harvest block division within the forest area is aimed at regenerating fodder trees, notably *Quercus sp.* (*khasru*, in Nepali). The CFUG members collect 20 *bhari*² of fodder every day. Fodder, grass, leaf-litter and fuelwood are made available free of cost for the CFUG members from November to May each year. Moreover, members with livestock are given priority in terms fodder collection and its distribution. In addition, some of the CFUG members have been taking their oxen to forests for grazing. The supply of fodder has reduced the reliance on rice straw and manufactured feed, usually sourced from the Southern Terai. Similarly, about 25 *bhari* of leaf litter is collected by individual households annually, which is used as animal bedding and farm manure. In addition, about 30,000 kg³ of cow manure is applied in the farm of the CFUG members in Kalopani every year. Though urea is commonly used in farms by those who can afford it, livestock manure has been preferred for sustainable crop yields. Merely 60 kg of urea per household per year is used in the farms in Kalopani.

Despite the availability of fodder, two particular challenges in terms of forest management were observed. First, widespread parasite infestation of the *Quercus* trees has seriously undermined their production potential. There has been little support from the DFO in terms of addressing this problem. Second, grazing can be a contentious issue. Some members see it as threat to the CF while others argue in favour of grazing rights for their oxen. While the CF has a close link with farming and has contributed enormously to household economies, livestock production is seen as an ‘additional’ benefit of CF, rather than one of the central contributions to food security.

Forest as a direct source of food

Wild food from the forests is the most direct and obvious way in which forests contribute to food security (Shrestha and Dhillion 2006; Agarwal et al. 2015). Besides being more accessible to the poor, the nutritional quality of wild food is much higher than many processed food types. Several studies have reported the collection and consumption of wild food in Nepal. For instance, Christensen *et al.* (2008) identified 228 edible mushroom species that are collected in the northern Himalayan region of Nepal. Similarly, a study shows that 41 plant species are collected from forests in Manang district of the central mountain region (Bhattarai et al. 2009 cited in Adhikari et al. 2016). Also, fruits, vegetables, mushrooms, honey, nuts and grains among others are available from forests and utilized by local communities (Adhikari et al. 2016).

² Bhari is a local term denoting the weight of forest products, where 1 bhari is equivalent to 30 kg.

³ About 1200 baskets of cow dung are collected every year to use as manure in Kalopani CF alone. 1 basket is equivalent to 25 kg.

In order to demonstrate contribution of the community forests to management and harvesting of wild food, the case of Chautari community forest in Morang district of Eastern Nepal is examined. Chautari has an area of 117 ha, with 734 households as members and a total population of 4,242. Among the forest products, mushroom, niuuro (*Diplazium esculentum*, an edible fern), tarul (*Dioscorea spp*, an edible tuber), and fruits (including mango and guava) are found in the forest. Mushroom and niuuro are the most popular, with about 100 households relying on these for their daily diet. Although only available on a seasonal basis, there is a gradual increase in the number of collectors in Chautari. This trend is attributed to two primary factors. First, increasing climatic stress, drought and reducing water availability for irrigation has mostly hit the poor, who increasingly rely on collection and use of wild food. Second, rising food prices in recent years have attracted the poor to collect wild food for consumption as well as to sell it in the local market. In addition, the local people regard wild food as having a high nutritional value. The operational plan of Chautari community forest allows poor and marginalized households to collect niuuro and mushroom on a regular basis.

Collection of niuuro and mushroom is carried out between February and August, and March to June respectively. In total, about 300 kg of niuuro is collected every day, with an average of 2 kg collected individually; a total of 200 kg of mushroom is collected every day. About 105 households, with an average size of 5 members per household are involved in collection of mushroom on a daily basis. For some of the CFUG members, the availability of these food products in their community forest has become a blessing. If there were no niuuro and mushroom available in the forest, the CFUG members would have to purchase food from the market at high cost. Nevertheless, there has been little or no support from the DFO for management of the wild food in the forest. While most of the scrutiny is over timber and fuelwood, there is a risk of declining wild food in Chautari.

Forest, renewable energy, and food security

Forests are a critical source of energy, which is one of the core elements of food security. Nepal's energy consumption pattern shows that solid biomass is the predominant energy source, where fuelwood has played a major role (Gurung et al. 2013a). Overall, 64% of households use fuelwood as their main source of cooking fuel (CBS 2011b). For households of the mountains and hills, 87.9% and 76.2% respectively rely on fuelwood for energy (CBS 2009). Given an increasing population and migration patterns, usually from the hills and mountains to the southern plains of Terai, the demand is expected to rise in the coming years. For instance, a study by Kanel et al. (2012) estimates the demand of fuelwood per year to be 6.07 million tons, 4.78 million tons, and 0.85 million tons for the Terai, middle hills, and mountain regions respectively in 2020.

The community forest's contribution to food security through fuelwood is demonstrated by the case of the Janakalyan community forest of Nawalparasi district. The forest spans 182 ha with 287 households and a population of 1,485. The community forest operational plan estimates an

annual production of 40,631 bharis of fuelwood which satisfies the demand of 31,200 bharis, while leaving a surplus for sale. Almost 70% of CFUG members consider it to be the preferred choice for energy, primarily due to its availability and accessibility. In particular, an assured supply of fuelwood is critically important for particular groups, mainly Dalits and marginalized households, who have no energy source other than fuelwood. On average, the CFUG members collect fuelwood worth NRs 534,000 per month (USD 4,866/month)⁴. In addition to meeting their household needs, some CFUG members derive their livelihood from selling fuelwood. The existing policies specified in the operational plan allow collection of fuelwood by CFUG members for sale.

Despite this critical importance of fuelwood in cooking, access to fuelwood is sometimes undermined. Citing problems related to illegal collection of forest products, the DFO Nawalparasi periodically imposes bans on collection of fuelwood. In such situations, the members either have to collect illegally during the night time (risking their lives from wild animals) or opt for alternative fuel sources including liquefied petroleum gas (LPG) which is not always economically feasible for households who rely on daily wage or sell forest products for their livelihood. Referring to these scenarios, many CFUG members – mainly *Dalit* women in Janakalyan – face hardship in collecting fuelwood despite the supply outweighing the demand.

This case study implies that CF meets some part of the essential energy demands of communities, hence supporting food security, although the demand is rising and the capacity to meet the future demand is uncertain. The question then is to determine how and in what ways CFUGs can secure their food and energy needs given the toughening CF legislation.

Discussion

Various reports on community forestry in Nepal indicate the current level of contribution to food security is much below its potential (e.g. Thoms 2008; Ojha et al. 2009). However, there are several emerging processes at the local level through forests that are being managed more actively for addressing concerns on food insecurity. The current food security outcomes are the result of sporadic, site-specific innovations and there is a lack of careful planning to strengthen these pathways. If the pathways between community forest and food security are fully understood, then policy and institutional frameworks can be geared towards enhancing these pathways for increased food security outcomes from community forest management.

The four cases presented above demonstrate that Nepal's community forests are contributing to food security through at least four important pathways: income and employment, forest-farm linkages, direct food, and renewable energy. These pathways are not uniform across all the cases, which highlight the fact that a particular pathway depends on specific characteristics of the community forest such as ecological specificity, resource endowments, market access, and the

⁴ The calculation is based on the total households collecting an average of 10 bharis every month multiplied by the price of every bhari of fuelwood: 267 households x 10 bhari/month x NRs 200/bhari = NRs 534,000

nature of the rural economy. Emerging from the analysis of the four case studies, three basic attributes of community forests that lead to one or more pathways to food security can be identified: 1] protection of forests and associated ecosystems; 2] regulated and sustainable use of various components of forest ecosystems; and 3] equitable arrangements in benefit sharing, especially favoring poor and marginal groups. These basic attributes are elaborated as follows.

Protection of forests and associate ecosystems

The availability of key forest products, whether these be a Nepali handmade paper enterprise, fodder, wild food, or fuelwood, are the result of strong protection measures practiced in Nepal over the last four decades. Given the degraded condition of the most forests prior to hand-over to the communities (Branney and Yadav 1998), it would not be possible to generate these forest products without some form of protection intervention. Under the ‘business as usual’ scenario of the 1980s, forests were not healthy enough to reliably supply these products. The introduction of the community forest program –along with clearly set management priorities, strong legislative backing, thorough legal and regulatory instruments, and the development of community forest institutions – has created a favorable environment for protection of forests. Evidence from key informant interviews reveals that all the four CFUGs have enforced forest protection since their establishment, and despite some restrictions in the access initially⁵, such protection interventions have resulted in the development of collective natural capital capable of providing enhanced benefits to communities.

Regulated and sustainable use of forest ecosystem

In all four cases conservative management practices, and the operational plans and decisions of CFUGs have ensured a regulated and sustainable use of forest biomass. CFUG members have adopted livelihood activities based on the estimated supply of the diverse forest products. Consequently, sustained supplies of raw materials have been maintained through consciously designed and endorsed provisions.

Equitable arrangements in benefit sharing

The four cases show that existing community forest policies and institutions have the potential to facilitate equitable benefit sharing among members, thus leading to equitable food security outcomes. Distribution of free shares to marginal groups in the case of the paper enterprise and free access to collection and sale of niuuro and mushroom are two notable examples that have helped users derive food security from forests. Similarly, a number of strategies have been adopted by the CFUG leadership in terms of designing provisions to facilitate the supply of forest products to targeted groups. This is illustrated in the case of Kalopani community forest where households with livestock have been given priority in terms of fodder collection. In case

⁵ A number of studies have shown that community forestry has reduced forest access of the poor and marginalised groups when such protection was enforced (e.g. Dhakal et al. 2005; Dhakal et al. 2011).

that could be seen as performing better than the average, CFUGs have developed arrangements to facilitate access of the poor and marginalized groups to forest resources, thus creating opportunities for the poor to benefit from the above discussed pathways.

These basic attributes of community forest institutions are clearly favourable for contributing to food security. However, the four pathways to food security we have identified are not yet adequately supported, and, indeed they are even hindered, by policy. The regulatory provisions relating to the harvesting and sale of forest products are complex and tedious to introduce, requiring many rounds of paperwork which is often beyond the local capacities (Gritten et al. 2015). Community leaders show frustration over the need to make too many visits to DFOs to seek permission, and obtain orders, which demand member's additional time and effort (Neupane 2000; Mahapatra 2001; Nagendra 2002). Despite the fact that particular segments of CFUGs have been deriving direct food from forests, current forest policies have overlooked, and in most cases deterred, local communities from exploring the conservation and management of wild food (Adhikari et al. 2016). This is also reflected in their operational plans that do not recognize wild foods as a priority forest product in terms of forest management. This lack of recognition can be related to the fact that operational plans are primarily guided by policies and regulations which strictly prohibit collection of foods from forests.

These case studies demonstrate that activating the link between forest and food security is particularly critical from a social inclusion perspective. For example, the share of fuelwood collection from community forests is higher in low income groups, lower-caste groups and larger households or those with more unemployed household members (Sapkota and Oden 2008). While the operational plans of CFUGs target poor and low-income groups for a better share of fuelwood, periodic bans on the collection and harvesting of forest products citing illegal activities have been often taken as an immediate solution to forest conservation. This type of faulty policy decisions has not been in the favor of the poor (Gurung et al. 2013b).

Factors outside of the community forest and its internal institutions also affect the ways to which pathways to food security can be opened up. Most notably, limited human resources in government forest agencies are a key factor constraining the active management of forests (e.g. Thoms 2008). Further, the growing demand for technical support has created a gap in the delivery of the services required by CFUGs. This has particularly affected the functioning of forest-based enterprises primarily owned or run by CFUGs.

In general, forest policy fails to adequately recognize the important relationships between forest, agriculture, and livestock (Dhakal et al. 2011; Adhikari et al. 2016). In particular, livestock is not recognized as a key aspect of managing forests within the forest policy framework, and consequently community forest interventions have resulted in declines in livestock numbers (Dhakal et al. 2005; Dhakal et al. 2011). For example, in the Kalopani case study, there is clearly a need for more fodder and grass, yet the operational plan lacks any provisions for developing fodder, grass, and other livestock support activities. This thinking comes from the

conventional forestry philosophy that places forest conservation as the main goal without incorporating community needs. Despite significant challenge to this philosophy in both conceptual and practical domains, the “forest first” thinking in community forest management presents enormous challenges for widening and deepening the role of community forestry in food security.

Conclusions and policy implications

At a time when international studies have highlighted the need to link forest management systems with food security, this paper has analyzed how Nepal’s community forests contributes to food security, and what lessons can be learnt to improve the linkage. Drawing on a literature review and four case studies, this paper shows that although community forestry already contributes to the food security needs of local communities the full potential is not realized. Forest policy neither adequately acknowledges the link between forests and food security, nor does it support the pathways through which forests contribute to food security. These four pathways are through providing: 1] income and employment; 2] farm inputs across the forest-farm interface; 3] a direct source of food; and 4] energy. Though not all pathways play equal roles in contributing to food security outcomes, different pathways function effectively in particular contexts. In some cases, people can reap dual benefits from forest products; for example, fuelwood and forest foods for subsistence use and sale. In all case studies, community forests have supported the food security of the CFUGs, particularly those of poor and marginalized sections.

However, there are four changes that need to be made in Nepal’s forestry mindset and policy in order to realize the full potential that community forestry has for contributing to food security. First, there is a need for in-depth research to generate alternative knowledge and transform the conventional wisdom from ‘forests for soil conservation’ to ‘forests for food security’ without compromising the environmental services provided by forests. Second, realizing the research-policy gap on the issue, there is a need to engage critical researchers and policy makers in order to apprehend and recognize the pathways linking community forests and food security. Third, to complement this critical policy research there is a need to better understand the quantitative dimensions of, and interactions between, the four food security pathways. Finally, the integration of sectoral planning and actions, mainly between the agriculture and forestry agencies, needs to be reflected in order to mainstream priorities that would ensure community forest-food security linkages. This should be taken into account in national-level policy debates as well as policy formation at various government levels.

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