Why has community forestry made limited contribution to food security in Nepal?

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Abstract:

With the growing problem of hunger and food insecurity in global south, debate has initiated among scholars and politicians to link forest to food security and nutrition. As one-fourth of its population living in absolute poverty, Nepal is also facing serious problem of food insecurity particularly among poor and marginalized community. Major part of the poor population lives in rural areas and relies heavily on traditional agrarian economy with integrated forest-livestock-farm system. However, modern forest management approaches including the community forestry despite its lauded success has undermined the historical forest-farm linkage and created barriers to address the issue of food security from forest. In

this backdrop, this paper investigates why CF institutions are not adequately responsive to the growing issue of food insecurity despite its huge potentiality for so through integrated and multiple use of forestry.

The paper is based on literature review, critical review of policy documents and review of operational plans of six community forest user groups from two mid-hill districts of Nepal (Kavrepalanchok and Lamjung). The review of operational plan focused on community rules related to fodder production and grazing management. It is found that the CF institutions have three major constraints. First, there is strong influence of the conventional forestry science that conceptualizes forest management either for biodiversity and wildlife protection or commercial timber enterprises. Second, there are various regulatory barriers which restrict the use of community forests for fodder production and grazing. Third, the institutional fragmentation restricts the use of forest land for non-forestry species. For fostering better linkage between community forest and food security, these three factors needs to be tackled simultaneously. We suggest adaptive collaborative management approach building on the previous research conducted by ForestAction Nepal in collaboration with the Center for International Forestry Research (CIFOR) and International Development Research Center (IDRC) for multiple use forest management. The paper finally draws implications to CF policies and institutional architecture.

Key words: community forestry, fodder production, grazing management, livestock, livelihoods

1. Introduction

As many countries in the globe, particularly the least developed ones, are facing the acute problem of food insecurity and hunger, the debate of contribution of forest to food security and nutrition has surfaced out. Global leaders[1] and scholars[2] have realized the potentiality of contribution of forest to

[1] In Rio+ 20 summit held in Rio in 2012.

address the problem and initiated debate on possible options and associated challenges. Scholars have argued that forest ecosystem provide diverse products and services that can help to solve the problem of the food insecurity, hunger and malnutrition (Mohamed-Katerere and Smith, 2013). However, the modern forest management practices are found irresponsive to the problem and have done limited contribution to food security if not further worsen the situation.

Nepal, a mountainous country, where majority of population live in rural areas with traditional agrarian economy with integrated forest-livestock-farm system. Animal husbandry is the integral part of subsistence mountain economy and directly contributes to household income (12%) and provide indirect input to farming system i.e. manure and draught power (Maltsoglou and Taniguchi, 2004). Most of the poor and marginalized people have very limited landholding and depend on communal land (forest) for feeding livestock. However, the modern forest management practices has undermined the historical nature-society relations and affected the life of rural population. Ironically, the much-lauded success of community forestry (CF) institutions have posed restrictions on fodder production and grazing (Adhikari et al., 2007, Dhakal et al., 2010, Thoms, 2008, Dhakal et al., 2005, Gurung et al., 2009) contributing towards declined livestock numbers (Dhakal et al., 2010, Adhikari, 2004, Thoms, 2008, Malla, 2000). Indeed, Nepal's community forestry is oriented towards protection of forest, timber production and maximizing group income (Dhakal et al., 2010, Malla, 2000). Such restrictive community forestry institutions have two consequences. First, the livelihoods and food security of these poor farmers is seriously undermined. Second, the growing demand for meat and milk products in the country is met largely by imports.

[2] About 400 scientists gathered in a international conference organized by FAO in Rome in May 2013 to discuss on the issue of linking forest with food security and nutrition.

However, there are limited understanding of why modern forest management approach is restrictive to link the forest with food production so as to address the problem of food insecurity and nutrition. This paper aims to contribute to fill this knowledge gap by investigating why forest policy and institutions are not adequately responsive to the food security despite its huge potentiality for so through integrated and multiple use of forestry. We investigate this problem by critically examining the Nepal's community forestry. Our analysis will seek the answer to the specific question; how and why CF institutions in Nepal are not responsive to the local need of linking forest to the food production.

The paper is based on literature review, review of policy documents and review of Operational Plans[3] of selected CFUGs. Forest sector policy and legislative framework particularly related to community forestry were critically reviewed with particular focus on provision related to food security. We have reviewed the Operational Plans of six CFUG which are selected for a five year Australian Center for Agriculture Research (ACIAR) funded action research project to food security from management of agroforestry and community forestry. Besides, analysis in is also enriched from the authors' experiences of working in Nepal's forestry sector and engaging with policy actors. .

After setting the context in section two, we present the analytical framework in section three. Sections four through six presents the analysis on three key aspects; forestry science, policy and regulatory framework and institutional mechanisms. We analyze how and why these three key aspects are creating barriers to link forest with food security. In section seven, we discuss the linkage of these three aspects and suggest ways forward to dealing with these issues to foster better linkage between forest and food security.

[3] Operational plans are management plans of the CF which is prepared by community forest user group with support from technicians and approved by District Forest Office.

2. The context: food security and community forestry in Nepal

Food security is defined as a situation in which all people at all times have physical and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO, 1996). The concept of food security is constituted of three key pillars: availability, accessibility, utilization and stability of the food (Mohamed-Katerere and Smith, 2013) Availability of food can be understood in terms of physical presence of food through local production, imported from outside or food aid. Accessibility can be understood as the access to adequate food through one's own production, purchase, barter, gifts or food aid. Utilization refers to one's ability to store, process, prepare, consume and absorb the available nutrients from the available food. Similarly, stability refers to the sustainability food ability.

However, the debate on food security has increasingly brought alongside the concept of nutrition which refers to dietary needs based on the specific condition of a human body. While the dietary need refers to all types of nutrients such as energy, protein, vitamins, minerals, fat and water, the requirements of these nutrients vary with condition of the body – young and old age, working ones, pregnant or breastfeeding mothers, etc.

2.1 Growing problem of food insecurity in changing rural landscape of Nepal

The study shows that Nepal has experienced a serious challenge of food scarcity and hunger among poor and marginal communities especially in the hill and mountain regions. Though it is a historical phenomenon in Nepal, it has become increasingly severe in recent years where larger numbers of people have experienced food scarcity for longer periods than in the past. The nutritional status is even poor. Almost 50% of children under five years suffer from chronic under nutrition and 15% from acute malnutrition (NPC, 2013:2). The problem of food scarcity and hunger is more acute in certain geographic areas and among certain social groups. In general food insecurity is closely linked with poverty and

therefore, rural populations are more insecure than urban areas due to high rural poverty. For example, 23% of the rural people consume inadequate diet and 26% are considered food poor, compared to 10% people consuming inadequate diet and 13% are considered as food poor in urban areas (NPC, 2013:12). Similarly, several districts in the mountain region frequently suffer from seasonal food insecurity.

Shrinking access to productive land, declining farm productivity, increasing population, limited access to farm inputs are the major reasons for declined agricultural production. In the last 10 years, total farming households have increased from 1,16,000 to 3831000, while during the same period, the total land under cultivation has decreased by 129000ha (currently it is 2525000ha) (NPC, 2013:1). More importantly, distribution of existing farmland highly skewed so that over half of the farming households own less than 0.5 hectares and there are over 80% holdings with less than 1 hectare (Table 1). Consequently, these farmers heavily rely on public lands such as community forests to meet most of their forest and other natural forest product needs.

Table 1: Number of households under different average size of holding

Land size (ha)	Year		
	95/96	2003/04	2011/12
<0.1	6.44	7.3	9.1
<0.5	39.9	44.8	52.7
<1	66.14	72.9	80.1
>1	33.86	27.1	19.9

Source: (CBS, 1996, CBS, 2004, CBS, 2012)

2.2 Assessing thecontribution of community forest to food security

Forest ecosystems are intricately related to agricultural system especially in the context of rural agrarian economy with predominance of traditional integrated farming. The forests support agricultural production in various ways: providing mulch, serving soil, soil fertility, preserving moisture and source of water, supporting livestock and thereby providing manure and draft power, among others (**Figure 1**). Given in the mountain topography, low development stage, small land holdings and isolated farms,

mountain agriculture can be characterised as traditional subsistence farming. Bullocks are used to plough the land and pull carts in the plains. Farmyard manure is the major source of fertilizer complemented by leaf litter from forests. Grass, fodder and grazing fields are crucial to maintain livestock, a key component of this integrated farming. In such context, forests play critical role in supporting farming.

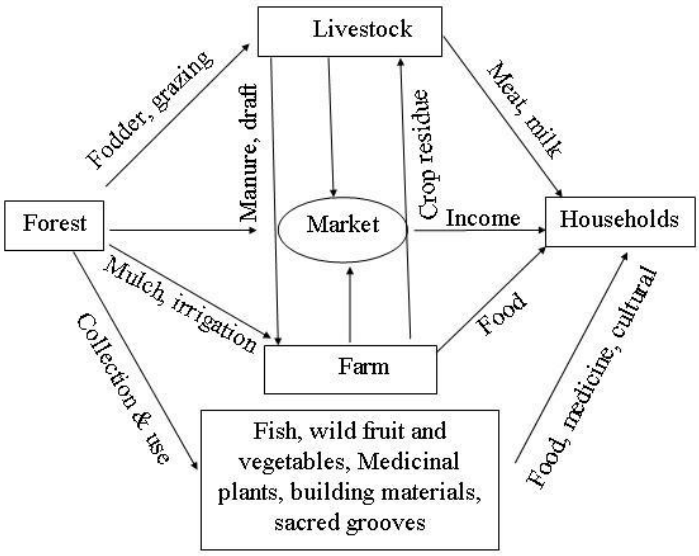

Figure 1: Complex relation between forest and farm in subsistence mountain farming in Nepal (Adapted from Paudel 2005)

Apart from supporting subsistence farming, forests play vital role in promoting animal husbandry which is an integral part of the rural economy and is increasingly becoming a major source of income in Nepal. It contributes to more than 12% of household income, in addition to sustaining farming system (Maltsoglou and Taniguchi, 2004). In a country where about one-third of the people live in absolute poverty and are dependent, partly, on livestock for livelihoods, communal forest lands are the key source of promoting it through supply of fodder and grazing. However, the expansion of community forestry institutions have posed strict restrictions on fodder production and grazing (Dhakal et al., 2010, Gurung et al., 2009, Thoms, 2008, Adhikari et al., 2007, Dhakal et al., 2005, Malla, 2000). Partly as a

result of such restrictions, the number of cattle per household has sharply declined over the past few decades (Dhakal et al., 2010, Thoms, 2008, Adhikari, 2004, Agarwal, 2001, Malla, 2000). This is however not surprising given that Nepal's community forestry is taking either a protectionist path, or is driven by objectives of maximizing cash incomes (Dhakal et al., 2010; Malla, 2000). Similar findings were observed in the Indian hills where strengthening forest protection programme have had negative impacts on livestock. Besides, there are little or no programmes for enriching forests with grass or fodder trees.

3. Analytical framework

Our analysis in this paper focuses on the fundamental question of why forest management practices are not responsive to the growing problem of food insecurity globally. While understanding the barriers of enhancing food security outcomes from forest management, we take three factors: forestry science; policy and legislative framework and institutional arrangement. These factors often interact among each other or influence each other in some ways. First, the way in which conventional forestry science defined forest and forest management practices is problematic in terms of optimizing food security outcomes from the forest. It has prioritized a particular purpose of forest management which eventually undermined the historical practice of nature society relations. We analyze why such narrow definition of forest and forest management practice has undermined its potentiality to address food security. Second, forest management is determined by policy and legal framework of a particular country. We investigate whether and how CF related policy and legal framework of Nepal has constrained the forest-food security linkage. While doing this, we categorize the policy and legal framework into three categories: broader planning framework, legislative framework and implementation framework. Third, we analyse institutional barriers to linking forest management to food security. Within this, it is important to look at both government institutions and institutions within the community i.e. CF related

rules and practices. We sub-divide institutional arrangement into government structure and institutions at local level.

There are three distinct pathways of linking forests with food security (see Figure 2). As we are dealing with CF, we present the pathways on how CF can support food security. As shown in the figure, CF can contribute to: i) wild food: CF land can produce a range of fruits, vegetables, root crops, honey and many other food items that can be harvested and consumed; ii) farm forest interface: CF can support to livestock and crop production through fodder, grass, mulch, manure, watershed protection, soil conservation, and protection of biodiversity; iii) income and job: CF can generate income and employment from forest based activities mainly timber, Non Timber Forest Products (NTFP), ecotourism and Payment for Ecosystem Services for instance through Reducing Emission from Deforestation and Forest Degradation (REDD+) mechanism.

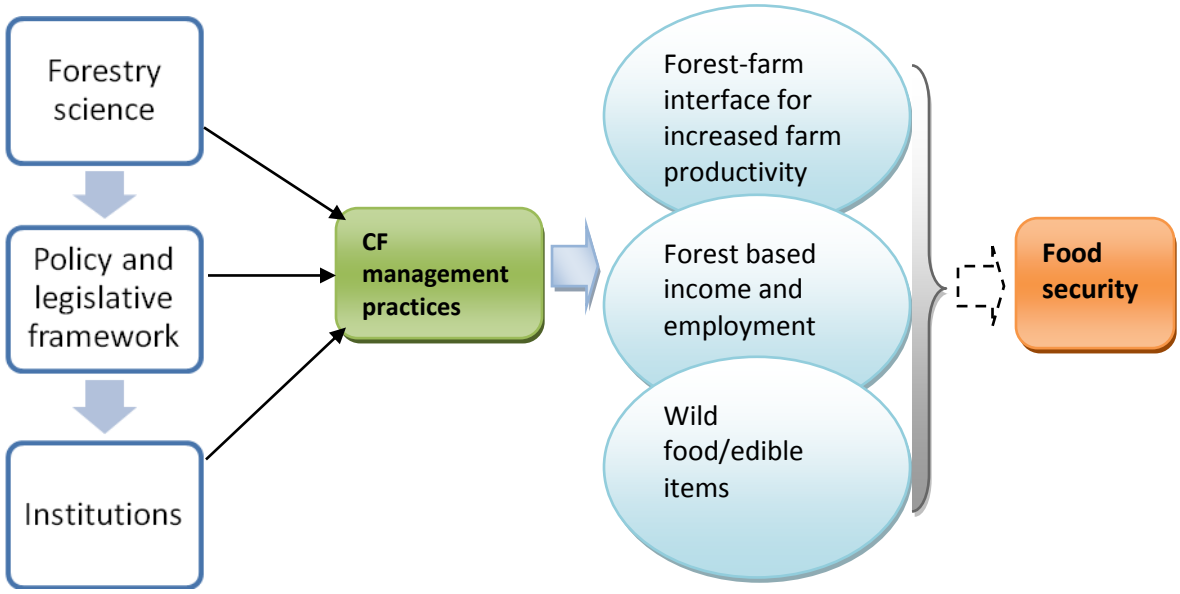

Figure 2: Framework for analyzing CF and food security linkage

Among these three distinct pathways, this paper focuses on forest-farm interface particularly promoting animal husbandry through grazing and fodder management in CF.

4. Conventional forestry science as a barrier to food security

The modern forestry science which was developed in Western Europe has defined 'forest' as a special category of land that was largely managed for power, pleasure and rentals by the kings and novelties, often excluding the common people (Fay and Michon, 2005). It had little to do with the nature or ecology and was used mainly to represent the symbolic relations of power where some enjoyed privilege and others were excluded (Fay and Michon, 2005). This narrow notion of forests was applied to large landscapes bringing them into legal category of forest that suited the dominant political and economic interests of the state and ruling elite. Forest as a legal category then helped states to shape particular social relations to natural resources and people dependent on it. It narrowly valued trees, above ground vegetation and biomass which gradually became an ideology that could neither respect the ecosystem integrity nor the socio-economic and cultural values of any society (Michon et al., 2007). The dominant definition of forest often considers agriculture and its associated activities and actors such as peasants and local communities as enemies (Westoby, 1979).

The forestry science conceptualized the forest management to enhance forest stock, crown cover, biomass or biodiversity in widest sense. Nepal's forest sector policy and practice which has largely been influenced from the so called modern forestry science, has adopted the narrow definition of forest limiting the opportunity of addressing poverty or supporting local and national economies (Kennedy et al., 2001).

Therefore, despite the opportunities to improve food security of households on a sustainable manner through greater linkage of food security and forest management, especially in the community forests, forestry related institutions including policies and institutional practices have downplayed the role of forests for providing food to the people. The historical account of use and management of forest, on the

other hand, clearly shows that people had cultivated as well as collected or gathered food from the forest. This has still been the case in some rural communities in Nepal where the reach of forest bureaucracy and modern life has been limited. The way modern forestry has evolved in Nepal in the last 150 years, it has tried to delink forestry, farm and people's food security needs and that there are huge potentials to improve food security through strengthening the linkage between forestry and food security and to reduce conflict between forest bureaucracy and people in pursuit of more food and thus attempting to encroach the forest. In the later part of this section we briefly discuss how modern forestry has delinked historical linkage of forest-people relations and undermined the agenda of food security.

Throughout the history until the rise of Rana regime in the early 19th century, forests were all managed at the local level and people collected a significant part of food from forests, and forest and farms were intimately linked through shifting cultivation in some parts and maintenance of trees in the farms. Since the interest of the British East India Company lied on the timber production through scientific forestry, the agenda came to Nepal through political relations, state control on forests increased rapidly and timber harvesting in some regions and land clearing in other places was followed as it constituted critical economic capital underpinning the entire governance of the society (Regmi, 1971). Forest land conversion to agriculture was rewarded to increase revenue and expand the military (Gutman, 1991) while the peasantry earned a living through this (Regmi, 1978:20). The establishment of 'forestry department' in 1925 was aimed at producing more timber and controlling forest by the state. This type of forest management approach was further reinforced after the end of Rana regime which opened Nepal to the external development intervention, which was guided by the idea of strong developmentalist state. Forest policies of the country then began to be strongly mediated by this notion through 1957 private forest nationalization act. In tune with the triumph of Post world war II

development era, with emphasis on developmentalist state, the intention of this policy change was to bring all forests appropriated to local functionaries back under the control of the welfarist state. This change also affected some of the pre-exiting local communal forest management especially in western Nepal, where a form of indigenous forestry management has always existed independent of the state (Chhetri and Pandey, 1992). Through this change, forest entered a regime of national control through state administration, with a focus on national economic and conservation values of the forest, instead of localised livelihoods and food contributions.

More stringent forest regulations followed in 1961 and 1967, which allowed forestry staff to shoot people using forest "illegally". This was the continuation of the past practices, but with the state exercising tremendous violence against people using forests, bureaucratic forestry organization gradually strengthened to centralize the management of forest resources for dominant products like timber. Ministry of Forests and Soil Conservation (MFSC), with its two prominent departments (one related to national park and wildlife, and the other related to general administration of forest) was strengthened with expanding number of field offices and staff[4].

Meanwhile, along with intensifying global environmental concerns, forest policies took "ultra-conservationist" turn (Blaikie and Muldavin, 2004). A key intervention was establishing plantation in the area devoid of forests, but this intervention contradicted with the livelihood base of local people. As people's expectations were not incorporated, many of the plantations undertaken by projects as a quick-fix technical solution were actually not successful. Eventually, the local resistance forced experts

[4] At present, forestry element of the state (which is MFSC) constitute two organizational forms – a) five departments on forest, national parks, soil conservation, plant resources and research, and b) parastatals – Timber Corporation of Nepal (TCN), Herbs Production and Processing Company (HPPCL), Fuelwood Corporation, Forest Product Development Board (FPDB) and Nepal Rosin and Turpentine Industry.

and bureaucrats to reflect upon their previous practices, and as a result of which, national forestry plan emerged which recognised the role of local people in forest management (GON/DoF, 1976). Then the priorities shifted from forest to people - including issues of local livelihoods, influenced by a participatory turn in developmental practice. New rules were created to authorise local government called Panchayat to share control over forests with the government (GON/MFSC, 1978). This allowed local elites to capture control over the Panchayat forests working closely with local bureaucrats (Malla, 2001). The issue of livelihoods and food security continued to be sidelined. Later it was transformed into community forestry that created more meaningful opportunity for local people to participate.

In parallel, despite strong counter arguments that American notion of wilderness does not provide an appropriate model of conservation policy in the developing countries (Guha, 1989), the feudal and techno-bureaucratic powers in Nepal adopted it for reasserting their control over forest, while also demonstrating international commitment to the dominant discourse. Nepal enacted a new wildlife conservation act (1973) which allowed establishment of a series of national parks in the country. In the same year, Royal Chitwan National Park (RCNP) was established. Within about a decade, seven other national parks and three wildlife reserves were established. Recently, after 1990, conservation policy has created windows of opportunity for community participation (Nepal and Weber, 1994), primarily to contribute to conservation (Paudel, 2005), continuously sidelining the food security expectations of local people from the forest ecosystems.

The community based forest management regimes have become significant policy arrangement (Ojha et al., 2008) in the present day context. About one third of forest areas are being managed by local communities under varying state-community partnership. They allow local control over forest, but have little been supportive towards promoting food security (Dhakal et al., 2010).

In the recent years, at least at the international policy level, there is growing recognition of forestry as a contributor to food security. From the early 1980s, international agencies like FAO had obliquely referred to forest food and tree food. Therefore, at the international policy level also, which directly as well as indirectly impact national policy making, the real efforts to link forests and food security are of recent origin, and not yet decisive to reverse the long term trend of scientific forestry and western environmentalism. As a result, forestry as a discipline and governance sector has not yet considered forests as a source of food.

But in recent time, emphasis has been given to improve the linkage between forestry and food security. This is reflected, for example, in Forestry Related Outcomes of RIO+20 (Sept, 2012)[5]. It recognises forests and trees as direct source of food to the world's poor, as well as a source of income and wider ecosystem services. The document also recognised that these contributions are not adequately understood. This is probably the reason why national forest policies do not offer adequate arrangements to link forest to food security.

5. Regulatory barriers to food security

Nepal's periodic development planning and CF related policy and legal framework are not explicit in terms of the linkage of forest to food security. As of now, the country has 13th plan, which is a three year plan (2010-2013). All these plans unrealistically continue to see food security as an issue associated with agricultural sector, and fails to articulate a more realistic and comprehensive view of what food security is, and how it can be realised. Similarly, the forest sector legislations and operational rules like regulations and directives are restrictive to promoting food security from the forest. In this section we

[5]FAO, 2012. Forestry Related Outcomes of RIO+20 http://www.fao.org/docrep/meeting/026/me43ie.pdf

examine the policy and regulatory barriers to food security from the forest. While doing this, we structure our analysis in three categories: broader policy framework which include Nepal's development planning framework and forest sector policies; legislative framework which include forest and wildlife related legislations and finally the implementation framework including regulations and directives.

While millions of Nepalese subsistence farmers rely heavily on forest for their everyday forest product use, the forest policies have often been influenced by environmental agenda especially since the 1960s when Theory of Himalaya Degradation dominated the policy discourse. Since 1985 *basic needs* became key development approach along with the Introduction of participatory and community based forestry departing from earlier environmental agenda. The relation of forest and human wellbeing appears to have been recognised in poverty reduction strategy paper (2002-2007). The Plan aimed at reducing rural poverty through four strategies: broad-based economic growth; social sector and infrastructure development; targeted programmes especially for marginalised communities and regions; and good governance. Community forestry has the potential to contribute to all these strategies for achieving the national goal of poverty reduction, through sustainable forest management, livelihood improvement and improving forest governance.

However, it was only in the Fourth National Community Forestry Workshop 2004 when the role of community forests in livelihoods enhancement was clearly recognised and emphasised. Since then there have been several efforts to mainstream livelihoods and poverty agenda within forestry sector especially in community forestry. The 12th plan 2010-2012 had aimed at increasing forest productivity and reducing poverty through scientific, inclusive and participatory management and commercialization of forest and ecosystem services (12th plan: 100). Similarly, current development plan aims to enhance forest sector's contribution to national economy through better conservation, management and sustainable use of forest and biodiversity resources (13th plan 2013/14-2015/16: 52). It adopts a

strategy of creating jobs and enhancing livelihoods through commercial use of forest products and ecosystem services (13th plan:52).

Though above review suggests that recent development planning framework and CF related policies have gradually moved towards addressing the problem of poverty from forestry sector, the broader planning framework and forest sector policies have not provided explicit focus on the linking forest to food security. CF related policies are neither restrictive nor supportive for fodder production within the CF area. However, in many cases legislative framework and implementation level rules restrict production of fodder and food items in forest. We are elaborating the regulatory constraints in the later section.

However, despite these positive statements and broader policy level, the legislative framework which provides a legal basis for shaping local practice is silent if not more restrictive towards promotion of food security from the forest. Review of Forest Act 1993 reveals that there is no explicit legal provision for conservation and utilization of the wild food. Similarly, the legislation has prohibited the use of forest land for agricultural purpose. The National Park and Wildlife Conservation Act which provides legal basis for conservation of about 23% of country's forest area, restricts the use of even the forest products for local consumption.

The regulations and directives which provide an implementation framework for shaping the forest management priorities and practices are found even more restrictive for promotion of food security from forest. For example, the Forest Regulations 1995 discourages growing and managing food in forest. The following legal provision exhibits the level of restrictions posed to the user groups. In case the Users' Group desires to plant any cash crops which yields products for a long time *other than food crops* in the Community Forest without adversely affecting the crown cover and production of the main Forest

Product, it shall be mentioned the details thereof in the Work Plan (GoN 1995:Article 28). Similarly, the Forest Regulations 1995 prohibits any clearance of Forest areas for *agricultural purposes*, building any huts and houses and take any action which may cause soil erosion (GoN 1995: article 31/1).

The community forestry guidelines 2004 (2009) echo the above discouragement. *No agricultural crop* can be grown in CF land. However, cash crops such as fodder, grass, cardamom, broom grass, medicinal plants and fruit trees can be grown in land allocated to the identified poor households (MOFSC, 2009:45). Perennial Plants *other than food crops*, such as bamboo, fruits, NTFPs can be grown in CF in condition that it would not affect the density and production of main forest products (MOFSC, 2009:48) . It also emphasizes that *No cereal crop* (e.g. rice, maize…) and those crops which involved tilling of land (e.g. ginger, turmeric…) can be grown in CF land (MOFSC, 2009:55). Similarly, the Forest Regulation 1995 requires that the forest based industries cannot be established within the specified distance from forest (5 Kilometer in Terai and 3 KM in Hill). This has limited the scope of establishment of forest based enterprises. Moreover, though Forest Act 1993 allows the CFUGs to harvest and sell forest products, they require following lengthy steps on harvesting and sale as per the Forest Product Harvesting and Sale Guidelines of the government, which is particularly developed for government managed forests.

While above regulatory provisions explicitly target on cereal crops and other agricultural products, we did not find any provisions on the conservation and management of wild food.

The predominant management interventions in the CF include: thinning, pruning, weeding, construction of fire line, plantation of NTFP, fodder species, grass etc. Such practices have often limited the forest's contribution on farm. For example, the promotion of pine forest in many hill districts said to have reduced sources of water. It is especially true with plantation and promotion of pine forest that has unintended consequences of drying up water sources. Collection of leaf litter in the form of mulch is

generally allowed across the community forests with few exceptions. However, plantation, management and use of fodder and grass is not adequately encouraged despite the absence of explicit regulatory barrier. Grazing on the other hand is largely prohibited. Even in the high altitude areas where there are only range lands, the mobile pastoralists are discouraged to move their herds to the CF and are charged annual fees internally by the CF user groups.

6. Institutional barriers to food security

Not only the CF related policy and legal framework but also the institutional arrangements are restrictive to link CF with food security. The institutional fragmentation from central through local level restricts use of forest land for non-forestry species. This limited the scope of using forest for multiple use system. Similarly, even the CFUG rules are restrictive to use forest for diverse purpose like fodder production and grazing management that affects livestock production. This section is divided into two sub-sections. First, we examine how institutional fragmentation from central through local level has affected linking forestry with food security. Second, we present how CF institutions are restrictive to promoting food security with particular focus on grazing and fodder management.

5.1 Fragmented institutions (sectoral divide)

Subsistence farming is the predominant practice in Nepal's rural areas. As discussed earlier, forest is the integral part of farming system. Besides providing variety of the products to meet livelihood needs of the farmers, forest also provides different ecosystem services like farm nutrient and water sources that support the farming system. In this sense, forest and farm are interlinked and form an integral part of the rural economy.

However, land use practices and institutional mechanisms in Nepal are divided into two different sectors: forestry and agriculture. The forestry and agriculture institutions are divided from national

through all the way to community level. The agriculture sector is further divided into agriculture development and animal husbandry. Such division in land use practice and institutional mechanisms eventually undermines the potentiality of forest to support the increasing problem of food insecurity.

About 21% of land is set aside for agriculture with land entitlement to the farmers. Whereas about 40% of the country's land is allotted as forest of which ownership rests with the government. Of the total forest area, about 24% is under protected area system, about 33% under community based management system and rest under government management. Irrespective of the management regime, agriculture practice is not allowed in the forest area. As discussed in section four, the forest is narrowly defined for conserving biodiversity and production of timber (and non-timber forest products). All this has limited the potentiality of forest land to contribute on food security.

In addition to separate land-use practices, there is also a separate institutional mechanism from national to the local level. As presented in figure 3 there are two separate ministries to look after forestry and agriculture. The MFSC is taking care of about 40% of country's land area which is categorized as forest. On the other hand, Ministry of Agriculture and Cooperatives (MAC) is responsible to support agriculture and livestock development in Nepal. The MAC is comprised of different departments - Department of Agriculture and Department of Livestock Development - with differentiated roles. At the district level, there are separate offices for forest, agriculture and livestock development respectively called District Forest Office (DFO), District Agriculture Development Office (DADO) and District Livestock Development Office (DLDO). To provide services to the community, there are agriculture and veterinary service centers at the VDC level. Whereas, the forestry services are provided through Range Posts which are placed to cover number of VDCs. The functions of the Range Posts are to protect the forest and support and provide technical assistance to local community groups

to manage forests. All these three agencies work with community through separate groups formed at the community level. Community Forest User Groups which are registered in DFO are formed to manage and utilize the forest resources. There are more than 18000 CFUGs across the country which is not only managing forests to meet the basic forest products need of local communities but also generating income and contributing in different community development activities. On the other hand, the agriculture and livestock development groups are formed by the respective government agencies. The government agencies have mandate to work with their respective groups.

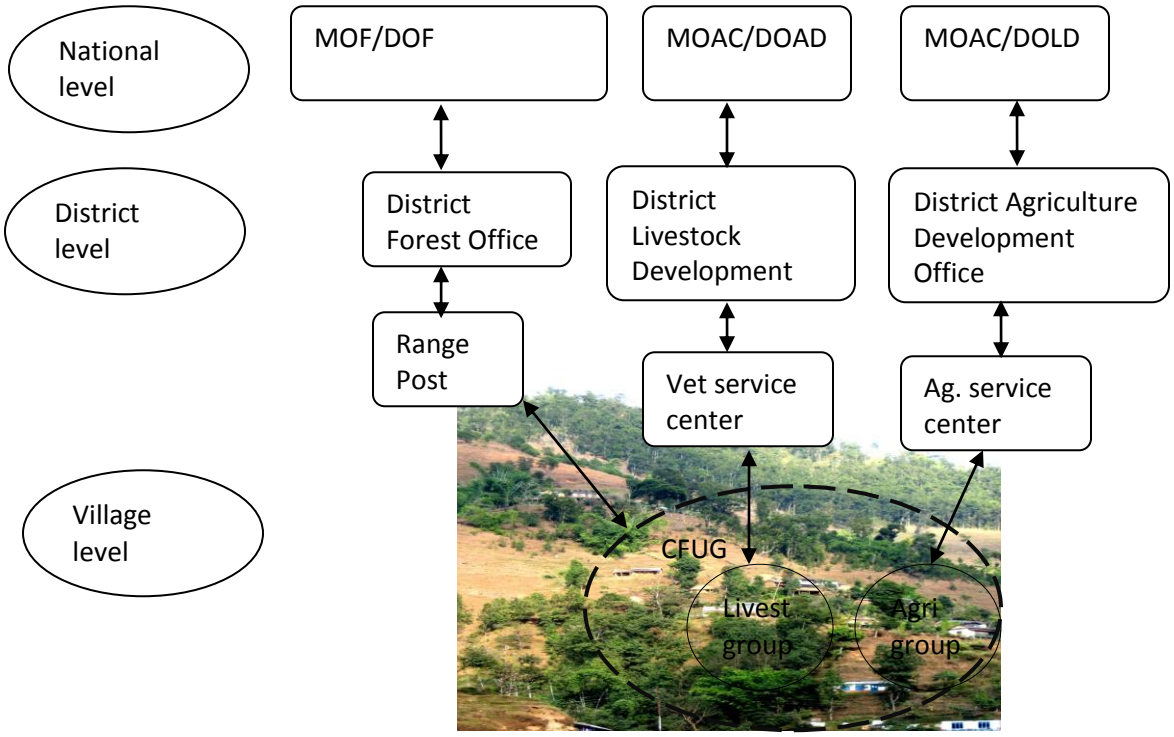

Figure 3: Institutional divide from national to local level

5.2 Restrictive CFUG rules: case of grazing and fodder management

It is not only the institutional divide from national to the local level that is limiting the scope of forest to contribute on food security. The rules within the CFUGs which are determined locally are also limiting

the prospects of contribution of CF to food security. We have reviewed the Operational Plans[6] of six CFUG which are selected for a five year Australian Center for Agriculture Research (ACIAR) funded action research project to food security from management of agroforestry and community forestry.

Table 2: Provision of grazing and fodder management in CFUG OPs

Name of CFUG			
	Grass	**Grazing**	**Fodder**
Lapse Ban, Methunkot VDC, Kavre	Allowed to collect grass on Aug/Sept and Dec/Jan (price-Rs 10/Bhari[7])	Grazing is prohibited (fine of Rs 50/cattle)	-
Sa.Pa.Ru.Pa (Saune Pakha) Methinkot VDC, Kavre	Allowed to collect grass on August/September and November/December (free of cost)	Grazing is prohibited (fine Rs. 50 per cattle)	Plantation of forage for income generation.
Kalapani, Dhungkharka VDC, Kavre	-	-	-
Pahagar Khola Baneko Danda, Chaubas VDC, Kavre	-	-	-
Langdi Hariyali, Nalma VDC, Lamjung	Plantation of improved grass species like Stylo, Molasis, Nepier etc both in CF and private land	• Encouraged stall feeding • Limited area allocated for grazing • Fine of Rs 10/goat; and Rs 20/cattle	• Encourage fodder trees plantation in CF and private land • Plans to plant 100 fodder trees each year
Aanp Chaur , Dhamili Kuwa VDC, Lamjung	Plantation of improved varieties of grass	• Encourage stall feeding • Provision of rotational grazing system • Fine of Rs 5/goat; and Rs 10/cattle	Promotion of fodder species in CF
Lampata, Jita/Taksar VDC, Lamjung	Plantation of improved varieties of grass	• Encourage stall feeding • Establish rotational grazing system	Promotion of fodder species in CF

[6] Operational plans are management plans of the CF which is prepared by community forest user group with support from technicians and approved by District Forest Office.

[7] Bhari is head load with average weight is about 30 kg.

		• Fine of Rs 5/goat; and Rs 10/cattle	

Source: *Analysis of CFUG OPs.*

Analysis of CFUG's rules on grazing and fodder management from the OPs revealed that grazing is prohibited in almost all CFUGs with provision of fines in case of violations. Some CFUGs have made provisions of rotational grazing in specified forest area. On the other hand, collection of ground grass is allowed for certain time period in a year. Some CFUGs have promoted improved variety of grass in the CF area. Some CFUGs have made provision of plantation of fodder in CF land but there has not been mechanisms on how such fodder trees are managed and fodder are distributed among the users. CFUG rules related to controlling grazing and limiting the free access to collection of ground grass has affected the small holders who have limited private land to feed their livestock. As there are no specific mechanisms to manage fodder in CF land, the only option they have is to decrease the livestock number. This supports the argument of some studies that promotion of CF institutions in the hills of Nepal has contributed to decreased number of livestock (Thoms, 2008, Dhakal et al., 2010, Adhikari et al., 2007).

There can be analytical question of why the CFUGs to make the rules that undermine the existing practice of utilization of forest as integral part of the subsistence farming system. This is arguably due to the influence of modern forestry science in CFUG decisions. Though by principal the CFUG rules are determined by users, the forest technicians and local elites prevail in crafting such rules in different ways (Giri and Ojha, 2011, Ojha, 2008). This means there is a limited say of poor and marginalized users in crafting the rules that determine forest management priorities and rules of using the forest products.

7. How to address food insecurity:

In the previous sections we demonstrated that potentiality of forestry in general and community forestry in particular to contribute on food security has been constrained by three major factors: conceptualization of forestry and forest management; forest related policy and legal framework and institutional fragmentation and insensitive CFUG rules. In this section we discuss how these three factors are interlinked and hinder the CF to contribute on food security.

Analysis in section three revealed that narrow definition of the forest and privileging forestry science has undermined the traditional practices of forest-farm interface and indigenous knowledge of managing and using forest. The modern forestry science privileged either bio-diversity conservation following the path of American notion of wilderness or optimization of timber production and generates revenue. Such conventional forestry science which has undermined the historical relation of forest and subsistence livelihoods has prevailed on the forest sector policy and legal framework. Consequently, the national policy and legislative framework has given priority to either conservation of biodiversity or promotion of timber-based forest management. Our analysis in section four revealed that the policy and legal framework has restricted the use of forest land to any non-forestry purposes. The current forest related laws including Forest Act 1993 and implementation framework including forest regulations have restricted the use of forest land for promoting food security.

Despite the fact that forest and farm are an integral part of rural livelihoods, forestry and agriculture institutions are delinked from the central through all the way to local level. The forestry institutions focus on timber-based management which is also strongly prevalent in CFUG rules. CFUGs have rules to control grazing and regulate use of fodder and ground grass which has affected livestock husbandry.

It appears that the three factors that we found constraining to link forest with food security – forestry science, policy and legislative framework and the institutions – needs to be dealt simultaneously. At the conceptual level, very recently debates have been taking place to broaden the definition of forest in

such a way that it can contribute to address growing problem of poverty and food insecurity (FAO, 1996, Padoch and Sunderland, 2013). It has been increasingly realized that forest can offer diverse goods and services that underpin food production. Following this, scholarly and political debate has started to emerge on how forest can better contribute to food security for instance Forestry Related Outcomes of RIO+ 20 and FAO conference on forest, FAO hosted international conference on forest for food security and nutrition in May 2013. Scholars have pointed out the need to integrating forest, tree and agriculture production (Padoch and Sunderland 2013) which arguably requires reorienting the resource management approach with more focus on sectoral coordination and landscape scale (Dewees, 2013, Padoch and Sunderland, 2013). Yet it is widely realized that there is knowledge gap in this field.

Besides the conceptual move, there is also need to transform the forest sector policy and legal framework and institutional mechanisms to make them more responsive to growing problem of food insecurity. From our own experience of moving through the journey of participatory forestry management, we strongly believe that we have not reached the 'end of history'[8] of forestry – such that a final policy approach and institutional framework have already been discovered and what all we need to do is to 'implement' it in practice. We are convinced that there are windows of opportunities where the legal framework and institutions can be reoriented towards making responsive the growing problem of food insecurity. For this, we need a whole different way of thinking and acting about change.

Such transformation requires questioning current approach of tackling with the issue and fostering changes. We see problems in the current approach. First, generally we take the policy and institutional framework as granted and try to change at local level. The solution then becomes providing some incentives to local communities or decentralizing some power to local bodies. As revealed in analysis in the previous sections, only fraction of the solution lies at local level. In many cases local rules and

[8] We draw metaphor from Fukuyama FUKUYAMA, F. 2006. *The end of history and the last man*, Free Pr.

practices are determined by conceptualization of the forest and constraints in policy and legal framework. Indeed, the underlying policy and institutional regime is more fundamental part of the local problems of resource management. So, we need to start from changing conceptual orientation, policy and legislation and then to the institutional arrangement from national through community level.

Second, the prevalent development approach is guided by technocratic approach – that privileges the experts and policy makers to make decisions for others, disregarding the agency and capability of the local community particularly marginalized ones. Even the participatory approach has legitimized expert-led, Euro-centric, modernist visions and strategies of change, forcing everyone to think through the Wes-centric lenses (Shiva, 1988) – and in effect creating 'participatory exclusions'(Agarwal, 2001). These strategies take the forms of formal rather than informal, documented rather than tacit, project-based rather than evolutionary, time-bound rather than flexible, evidence-rather than emotion-based, sectoral rather than systemic, disciplinary rather than holistic, uni-scale rather than multi-scale, oriented to pre-defined outputs rather than process-centered, and so on and so forth. There are advocates of indigenous knowledge and local visions of development at another extreme, but what we really lack here is an approach that engages with multiple worldviews and learning systems operating at multiple scales in this globalized world.

In view of the failure of existing approaches intervention, recent attempts have begun to look at the process dimensions more seriously – looking at how policy and institutions emerge, function, change and improve to address the challenges related to linking forest management with livelihoods and food security (Colfer, 2005) (Fisher et al., 2007, Hall and Clark, 1995). More opertionalisable concepts of learning and innovation have emerged around social and organizational learning related fields of knowledge and practices (Argyris, 1993, Schon, 2010), as well as around works that emphasize integrated analysis of society and natural systems, usually referred to as socio-ecological systems (Lee, 1993, Holling, 2001). Together these approaches have sought to consider learning and innovation

aspects of not just 'resource management' or a particular organization, but the entire socio-ecological system (Berkes and Turner, 2006) or the 'community of practice' (Wenger, 1996) or 'public policy as social learning systems' (Hall, 1993), involving multiple scales of time and space.

In a broad sense, adaptive management embraces active learning, accepting surprises, embracing uncertainty, and continually modifying the management in the light of learning to enhance management effectiveness. At the fundamental level, adaptiveness is seen to emerge from the inherent properties of resilience in ecosystem and flexibility in social system (Gunderson 1999). Such adaptive and collaborative approach provides the space to the relevant actors (at different levels) to interact and negotiate the goals of resource management, innovate the institutional mechanisms that provide better ways of managing resources to meet the changing local context and implement them (Ojha et al., 2013). The iterative process of action and reflection provides the space to the stakeholders to learn over time about institutions to manage the resources. Such action and co-learning process can help reorientation of the idea of forest towards more sensitive to meeting growing problem of food insecurity, reorienting policy, legal framework and institutions accordingly.

8. Conclusion

In this paper we attempted to contribute to the emerging debate on why there is limited contribute of forest on addressing the growing problem of food insecurity globally. We have taken the case of community forestry case of Nepal and presented our analysis to answer the question why community forestry institutions are not supportive to address the growing problem of food insecurity. Community forests are important common land-based resources involving almost 35% of the rural households who are poor having limited livelihoods options. Management of these forestlands and resources therein may provide good prospects of addressing the food insecurity problem. Among others, management of fodder and grazing could support animal husbandry that could increase income and meet food needs.

We framed our analysis taking three key factors that determine forest management practices: forestry science, policy and regulatory framework and institutional arrangement. We found all three elements as restrictions for promoting food security from the forest. First, there is strong influence of the conventional forestry science that conceptualizes forest management either for biodiversity and wildlife protection or commercial timber enterprises. Forestry science does not adequately appreciate the productive and sustainable relation in the forest-farm system.

Second, there are various regulatory barriers which restrict the use of community forests to meet the food needs in different ways i.e. livestock production, enhanced farm productivity etc. We have given specific emphasis to understand how CF related policy and legislative framework and found that regulatory provisions of CF are not very supportive to either of the forest-food security link: increased forest-livestock-farm link. The existing regulatory provisions narrowly aim at enhancing forest stock and crown cover and biodiversity or wildlife and do not encourage management of wild food. Similarly, it does not promote management of pasture, grass or fodder that support livestock and in turn agriculture.

Third, forest and agriculture related institutions are divided from central through community level which limited the opportunity for more integrated land management that could be responsive to the growing problem of food insecurity. More specifically, the CFUG rules are limiting the use of forest land for promoting animal husbandry which could help enhancing livelihoods opportunity and provide food at local level. We have based our institutional analysis from the review of OPs of selected CFUGs and our own experiences of policy engagement. In-depth cases constraints and innovations of CFUG institutions would help strengthen our understanding.

Based on this analysis, we argued that all three factors (forestry science, policy and legislative framework and the institutions) have constrained for linking forest to food security and it needs to dealt these aspects simultaneously. First, we need to broaden the conceptualization of forest to include dimensions of food security. Second there is need of greater policy sensitivity towards poverty, hunger and destitution among the citizen. Finally, government institutions and community rules and practices need reorientation towards promoting multiple-use and integrated forest-farm management. Revisiting policy and legislative framework requires engagement with policy actors from different levels with proven knowledge of multiple actors of different levels through action and learning process. It requires review of existing policy and regulatory provision to allow the space for multiple use forest management that contributes to address the issue of food insecurity. At the practical level, there is a need for proven resource management models and institutional arrangement that visibly increase the productivity of CF land without compromising long term overall sustainability of the landscape. A long term, participatory action research that explores such production process, institutional mechanism and market arrangements demonstrating action verified lessons may help increase CF relevance for poor rural people in Nepal.

Building on the preovious action research conducted by ForestAction Nepal in collaboration with the Center for International Forestry Research (CIFOR) and International Development Research Center (IDRC) for multiple use forest management, we suggest adaptive collaborative management approach for learning and transformation to make CF institutions more responsive to growing problem of food insecurity. This approach can also help generate knowledge that supports transforming the science as well policy.

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