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Editor: Radhika Johari

Enhancing **Livelihoods** and **Food** Security from **Agroforestry** and Community Forestry Systems **in Nepal:**

Current Status, Trends, and Future Directions



World Agroforestry Centre
International Union for Conservation of Nature
Australian Centre for International Agricultural Research

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July 2014

World Agroforestry Centre
International Union for Conservation of Nature
Australian Centre for International Agricultural Research

Citation

Gilmour D, Pradhan U, Malla Y, Bartlett T, Finlayson R, Shah R. 2014. *Enhancing Livelihoods and Food Security from Agroforestry and Community Forestry Systems in Nepal: Current Status, Trends, and Future Directions*. Johari R, eds. Bogor, Indonesia: World Agroforestry Centre (ICRAF) Southeast Asia Regional Program; Kathmandu: International Union for Conservation of Nature - Nepal; Canberra: Australian Centre for International Agricultural Research (ACIAR).

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Cover image

Typical mid-hills landscape in Kabhre district en route to Chaubas | photo by Tony Barlett

Design and layout

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2014

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EXECUTIVE SUMMARY

There have been significant changes in social, economic, institutional, as well as biophysical landscapes, particularly in rural areas across Nepal. Key drivers of these changes include migration, a remittance economy, community forestry and climate change effects, and the growing economies of neighboring countries. Ironically, these have had greater impacts on the poor, marginalized and women who reside in rural areas and rely on forests for their survival. While these changes have been clearly apparent, as yet, no long-term and large-scale assessment has been carried out apart from periodic surveys including the ongoing agriculture census. In these changing contexts, broader socio-economic research particularly to develop understanding on the changing landscape of resource governance, tenure rights and institutional development in the agricultural and forestry sectors is crucial.

This report presents the findings of background review studies conducted as part of a small collaborative research activity aimed at identifying research needs and priorities related to improving agroforestry and community forestry systems to enhance food security and livelihoods of rural people in the Middle Hills of Nepal. Key partner institutions in this endeavor were: the Australian Centre for International Agricultural Research (ACIAR), the World Agroforestry Centre (ICRAF, Southeast Asia); the International Union for Conservation of Nature (IUCN); the International Centre for Integrated Mountain Development (ICIMOD), and several key local Nepalese organizations.

Collaborative studies were carried out by partner institutions to explore selected themes identified through a scoping study and focus group discussions, which were subsequently discussed during a project planning workshop held in Kathmandu June 2012. They assessed emerging issues in the community forestry and agroforestry sector and provided recommendations for improving livelihoods and food security of the rural poor within ongoing programs and practices. The themes covered included: the policy and regulatory framework and institutional landscape for community forestry and agroforestry; drivers and dynamics of agrarian change; the contribution of community forestry and agroforestry to livelihoods and food security in Nepal's Middle Hills; the status, causes and consequences of abandoned land in the Middle Hills; and constraints and gaps in this sector.

The studies considered agroforestry and community forestry as drivers of change and agents of improvement in the food security and livelihood situation of local communities in the Middle Hills of Nepal. Agriculture, food security, and community-based forest management have been according high priority within all the major policies, as well as in sectoral policies. However, this focus has not been translated into actions to meet envisaged targets and objectives. Except for very few policies such as the Master Plan of the Forestry Sector, which has successfully created a paradigm shift in Nepal, many other policies remain to be well formulated and properly implemented.

Over the last thirty years, under the purview of a national community forestry program, 23% of forest lands have been handed over to local communities by way of more than 17,600 Community Forest User Groups (CFUGs). However, the management of community forests and subsistence agricultural systems in the Middle Hills of Nepal is suboptimal and livelihood outcomes remain limited and inequitable with the result that food security is widespread. Factors that impede the ability of community forestry and agroforestry systems to provide adequate livelihoods are complex and manifold, and are embedded in the social, cultural, political, economic, and ecological domains. Some of the critical factors include: low productivity of agricultural lands; suboptimum management of community forests; persistent inequity and marginalization of some community members; limited marketing opportunities for community forestry and agroforestry products; and centralized planning and service delivery.

This small research activity clearly indicates that it is essential for effective research in agroforestry and community forestry in Nepal to integrate both biophysical and social disciplines. The causes of food insecurity in Nepal stem from productivity issues, including management, markets, and labor, but also from issues associated with access, institutions and policy. Community and household access to and management of agroforestry and community forestry are embedded within layers of institutions and within the wider political economy. Positive changes can be achieved through a consideration of research evidence, deliberations and negotiations with communities and officials to change and transform existing, practices, institutions and policies.

CHAPTER ONE: COMMUNITY FORESTRY AND AGROFORESTRY IN NEPAL: CURRENT STATUS, CONSTRAINTS, AND OPPORTUNITIES

Radhika Johari, Consultant Editor, World Agroforestry Centre (ICRAF)

Agriculture is the principle source of food, income, and employment for the majority of Nepal's people, supporting a population of nearly 30 million of which over 80% resides in rural areas. Sixty-six percent of Nepal's population derives a basic livelihood from agriculture and from supplementary forest products and native tree species that farmers have long cultivated to meet their subsistence needs and maintain land productivity. These include timber, fodder for livestock, fuelwood for cooking, and non-timber forest products (NTFPs) for a variety of purposes, including food. Agriculture is thus the dominant sector in the economy, accounting for 35% of the GDP. The Government of Nepal recognizes that agricultural development is a key mechanism for achieving rural development and reducing poverty; yet most Nepali farmers operate at a subsistence level, and agricultural productivity is reported to be steadily declining, resulting in pervasive food insecurity.



Under-utilised land in Kavre, Nepal | by Aulia Perdana

A recent study suggests that as much as 41% of the population is undernourished and that 30 out of 75 districts in the country are food-insecure (Paudel et al. 2012). Over 3.5 million people are reported to experience “moderate to severe” food shortages. This means that food is insufficient to stave off hunger or provide sufficient calories for an individual to work and get through the day (WFP, 2012). Thus, while the purchasing capacity of a small section of society has increased, the situation for the majority of the poor has deteriorated. Food insecurity among the poor can be attributed to: limited access to productive land, lack of rural non-farm employment, low wages for paid employment, and minimal access to the remittance economy. A steady decline in agricultural productivity has been widely noted, and lack of access to quality inputs and their timely availability have become serious concerns. With agriculture becoming increasingly less rewarding, there has been a corresponding increase in abandoned agricultural land in the rural landscape.

The Middle Hills, one of three distinct regions in Nepal—the other two being the high mountains bordering China and the low-lying Terai bordering India—are a case in point. This region is characterized by complex, labor-intensive farming systems and a complementary relationship between crops, trees, and livestock, but with low productivity and cash returns as well as limited infrastructure. Traditional practices for maintaining soil fertility have sustained these systems. Nevertheless, soil fertility has declined over the last 20 years, leading to decreased yields for most crops. Previously cultivated farms have been abandoned because of severe labor scarcity resulting from outmigration, mainly of youth, to urban areas and overseas. Moreover, the long internal armed conflict (1995–2006) in Nepal has significantly impacted on all economic sectors, communities, infrastructure, and rural institutions, as well as on the country’s overall development.

Regarding the forest sector, 33% of Nepal’s total land is covered by forests. In recent decades, there has been a gradual depletion of forest resources in rural areas of Nepal where dependence on forests to meet basic sustenance needs is high. This is especially apparent in and around large agricultural tracts that are fragile and steep (Pandit and Thapa, 2004). Research has established a link between poverty and forest cover. In areas where forest cover is low, poverty has been shown to be correspondingly more severe, with less poverty evident in areas that are densely forested (Pandit, 2012). Thus, it is apparent that forests are a vital renewable resource base in Nepal that directly impact people’s livelihoods and food security.

While adverse trends have been evident in agricultural productivity and in the depletion of forest resources in recent decades, these have not been uniform. The latter portion of this period has also witnessed a shift, particularly regarding forest degradation, with considerable expansion of agroforestry systems as well as significant progress in implementing community management of forests. Community forestry and agroforestry have long played a vital role in the daily lives of a majority of Nepal’s population with several studies indicating their significant contribution to household incomes (Dev et al., 2003; Bapton and Cammaert, 2007; Chand and Ghimire, 2007; Pandit et al., 2009; Hobley, 2012). FAO figures for changing patterns of forest degradation in Nepal from 1999 to 2010 suggest the increasing effectiveness of these systems in stabilizing forests. Whereas forest degradation in the country was greatest from 1999 to 2000, at an annual rate of 2.09%, it improved between 2000 and 2005 at an annual rate of 1.39%.

During recent years from 2005 to 2010, forest cover change has remained constant (FAO, 2010). This stability can be attributed to the implementation of the national community forestry program, mostly in the hills of Nepal (Pandit, 2012). Prior to 2005, forest depletion caused severe problems of environmental degradation and decreased agricultural productivity with the annual cost of deforestation estimated to be approximately 11 billion Nepali Rupees. This issue was closely linked to high population densities leading to acute scarcity of available per-capita resources and wide-scale poverty within rural populations (Pandit and Thapa, 2004; Pandit et al., 2008). An interesting pattern emerges when figures regarding poverty reduction are examined for this period. Between 1996 and 2004, Nepal experienced poverty reduction of 11% (from 42 to 31%), and a further 6% between 2005 and 2009, with the latest figure for poverty being approximately 25.4%. While further research is required, these figures do suggest a correlation between forest cover improvement and a decrease in poverty.

Given this report's focus on exploring the current status of knowledge, policy, and institutional environments, as well as constraints, and future directions of community forestry and agroforestry in Nepal, these are briefly introduced here. Nepal's community forestry program can be conceptually traced to the late 1970s when increasing attention began to be focused on restoring the stability of degraded Himalayan hillsides and meeting the subsistence requirements of growing populations. Over the past two decades, Nepal has made significant progress in implementing a national community forestry program, particularly in the Middle Hills. Widely acclaimed within the South Asian region, and globally, this flagship program encompasses a set of policy and institutional innovations that empower local communities to manage forests for livelihoods to meet subsistence as well as income needs through the sale of forest products, while also enhancing conservation. Local people organized as Community Forestry User Groups (CFUGs) make decisions regarding forest management, utilization, and distribution of benefits. Currently, over 1.2 million hectares of designated community forests (nearly 23% of the national forest estate) have been placed by the Government of Nepal (GoN) under the control and management of over 1.6 million households who are members of 17,600 CFUGs. Of these CFUGs, 72% are located in the Middle Hills (Hobley, 2012). The program has also diversified since its inception, encompassing various models of participatory forestry, including leasehold forestry and protected areas.

Owing to their flexibility and social welfare orientation, CFUGs have been able to contribute to local livelihoods even when other local institutions have become dysfunctional (Nirmal, 2010). Several recent studies have confirmed that CFUGs have built substantial natural, financial, and social/institutional group capital, resulting in a number of household benefits and private capital gains. A large scale survey of CFUGs indicated that the employment generated by CFUG activities resulted in the direct transfer of NPR 850–1,280 per household. In addition, the CFUGs have been able to accumulate substantial funds (an average of NPR 366,000 per CFUG for forests that exceed 100 ha in area). A significant portion of this money is spent on community development, which has the potential to impact positively on the livelihoods of group members.

While Nepal's community forestry program is laudable for its social, political, and economic empowerment of forest users (Pokharel et al., 2009), the extent to which this happens varies across the country, and many challenges remain to be addressed (Carter, Pokharel, and Parajuli, 2011). For example, studies have indicated that management of community forests is suboptimal and that their contribution to livelihoods and food security could be substantially increased (Adhikari et al., 2004). Bureaucratic hurdles also contribute to under-performance of community forests, notably reluctance of government officials to approve timber felling prescribed for harvesting in Operational Plans and a government-imposed ban on harvesting greenwood since 2010 (Tamang et al., 2012). Moreover, many forest-based enterprises are struggling to sustain themselves because of inefficient value-chains.

Efforts have been made in the past decade to resolve issues of social exclusion and to reduce poverty. However, questions remain on how forests can best be managed to provide livelihood benefits (Campbell, 2012). At the national level, whereas each household has access to an average of 0.7 ha of community forests, there is a substantial gap between supply and demand for all forest products. The shortfall is particularly acute for extremely poor households (Hobley, 2012). Moreover, access to these products is inequitable. Entrenched patterns of discrimination and exclusion occur along the lines of ethnicity caste, and gender and local elites retain dominance and advantages in intra-community decision-making and benefit-sharing (Shreshtha, 2009). They also own the lion's share of land with the wealthiest households reported to own more than four times as much land as the poorest ones (Malla et al., 2003). *Dalits* remain the most socially and economically marginalized group within Nepali society with 48% of *dalits* being below the poverty line compared with 19% belonging to Brahmin/Chhetri castes (UN, 2011). Thus, many pending issues remain to be addressed in the country's community forestry program to achieve optimal results.

The above discussion highlights some of the gaps and constraints in the areas of agriculture, food security, and community forestry. What is, however, apparent is their priority and visibility in all of Nepal's major policies that are implemented through five-year plans and other similar instruments. In the case of community forestry, a strong policy base was established with the 1989 Forest Sector Master Plan, which has proved to be a very powerful policy instrument and the corner stone of a paradigm shift in Nepal's forest management. This policy focus on community forestry has been endorsed and further grounded within the subsequent 1993 Forest Act and the 2000 Forest Sector Policy. All of these signify the high level policy intent of using community forests to improve livelihoods and contribute to economic growth.

Turning to agroforestry, this is a prevalent traditional Nepali farmers' practice that involves integrating trees within cropping systems on private land, as opposed to community forestry on public land. However, compared with the latter, agroforestry has not been as well served in terms of a clear policy focus; there is no specific policy, strategy, or action plan that focuses explicitly on agroforestry and promotes this traditional practice as a means of enhancing livelihoods and improving food security. To some extent, agroforestry as a policy issue has fallen between the gaps. While Nepal's community forestry program has evolved significantly since its inception in terms of participatory approaches and institutionalization, and has been well researched, attracting the attention of researchers, projects, and programs, agroforestry remains poorly understood and has received little research attention in recent decades, despite evidence of its potential to improve livelihoods (Pandit, 2012). There have been a number of environmentally focused studies on the agroforestry sector, particularly in relation to soil conservation and disaster management. However, there has been less research attention to its role in enhancing livelihoods and improving food security in rural Nepal.

Several widely occurring agroforestry species have been identified in Nepal. Integration of agroforestry practices within farming systems is common, and may vary depending on the type of land available (Sinclair, 1999). The practice of growing trees in productive farm niches is widespread in Nepal. Depending on the agro-ecological zone, various agroforestry systems are implemented by Nepali farmers. These include home gardens, interspersing trees with agricultural crops, intercropping with horticultural trees, *taungya*, and silvofishery and silvopastoral systems (Amatya, 1994). Along with diverse types of agroforestry, the species used also vary according to different zones.

Moreover, there is a common consensus among researchers and practitioners that in addition to types of agroforestry, understandings and perceptions of benefits from agroforestry vary from one region to another and from one country to another. Given that the requirements of hill farmers for fodder and fuelwood are not being met, there is a need to innovate and improve current practices in Nepal (Neupane and Thapa, 2001). In light of evidence that agroforestry can enhance crop and livestock productivity, contributing to higher economic returns, various government and nongovernmental institutions have compiled species lists that have been or can be used for agroforestry—some according to physiographic zones and others according to their economic benefits. In the current situation of rapid change in farmland use, and a reduction of land available for farming and cultivation (ibid), the establishment of optimal agroforestry systems would be a significant contribution as these can potentially improve livelihoods by offering multiple opportunities to farmers in Nepal (Sharma et al., 2007). Thus, the promotion of agroforestry as a sustainability-enhancing practice that amalgamates the best attributes of forestry and agriculture is highly pertinent for assuring food security, reducing poverty, and enhancing ecosystem resilience (ibid).

Agroforestry's current contribution to livelihoods and food security in Nepal is indicated by relatively small scale development of markets for some agroforestry products. However, agroforestry systems continue to be predominantly managed to satisfy subsistence needs. This also applies, to some extent, to community forestry. The evidence for widespread improvement in private capital associated with adopting agroforestry practices is not clear, and has mainly been documented in the context of individual or small group case studies. Nonetheless, there is evidence that households can improve their livelihoods by embracing agroforestry. In recent years, local markets for certain agroforestry products, other than staple foods, have substantially increased, and there is also a growing international market. The increasing purchasing power of urban dwellers has led to an increasing demand for agroforestry products (fruits, nuts, spices, and other high value products).

The above discussion has outlined the current status of community forestry and agroforestry in Nepal, as well as key constraints and opportunities for improving their ability to meet critical requirements for food and livelihood security in Nepal. To explore future strategies for enhancing their impacts on livelihood and food security and addressing some of the gaps described above, it is important to emphasize the prevailing social and economic context of their application. In recent decades, there have been dramatic shifts in Nepal's social, economic, institutional, and biophysical landscapes, particularly in rural areas. Migration and a remittance economy; community forestry and the effects of climate change; and expanding economies of neighboring countries are key drivers of this change. Their impact is clearly evident, but till date, there have been no long term and large scale assessments within this dynamic context of change, excluding periodic surveys such as the agricultural census of their impacts.

This monograph presents review studies that explore the current status, constraints, and trends in community forestry and agroforestry in Nepal with a particular focus on improving livelihoods of the poor and marginalized and food security in the country. These studies were conducted for a small research initiative by the Australian Centre of International Agricultural Research (ACIAR) in collaboration with the World Agroforestry Centre (ICRAF). The project aimed to identify research needs and priorities for improving agroforestry and community forestry systems to enhance the food and livelihood security of rural people in the Middle Hills of Nepal. Specifically, the project aimed to:

- Synthesize the context of farming systems in the Middle Hills of Nepal, as well as the contributions and prospects of the Community Forestry Program and agroforestry systems;
- Identify the scope for improving agroforestry and community forestry for enhanced food security and livelihoods; and
- Engage stakeholders to establish future research priorities and contribute to the development of a research proposal.

The scoping study was facilitated by Dr. Don Gilmour, a forestry and environmental consultant from Australia, who was engaged by ICRAF. Several individuals collaborated in the project and workshop as coauthors and contributors from the following institutions: the Universities of Adelaide and New South Wales in Australia; ICRAF; the International Union for Conservation of Nature (IUCN); International Centre for Integrated Mountain Development (ICIMOD); Nepal Agroforestry Foundation; Forest Action, Nepal; and SEARCH Nepal. Their names are provided in Appendix One of the report.

This report is organized as follows. Chapter Two discusses Nepal's policy and regulatory framework for community forestry and agroforestry. Chapter Three maps the institutional landscape of community forestry and agroforestry in Nepal. Chapter Four discusses drivers and dynamics of agrarian change in Nepal. Chapter Five highlights the contribution of agroforestry and community forestry to food security and livelihoods in Nepal's Middle Hills. Chapter Six explores the causes and consequences of abandoned agricultural land in the Middle Hills of Nepal. Chapter Seven identifies constraints and knowledge gaps in agroforestry and community forestry. Chapter Eight identifies research problems and capacities, and suggests what impacts can be anticipated from future research in this sector. Finally, Chapter Eight provides a synthesis of key themes and findings presented in the report, and offers broad conclusions.



Agroforestry near Dhulikel | by Tony Barlett

CHAPTER TWO: NEPAL'S POLICY AND REGULATORY FRAMEWORK FOR COMMUNITY FORESTRY AND AGROFORESTRY

Shanti Karanjit, Yam Malla, and Rajendra Khanal, IUCN Nepal

2.1 Introduction

This background study reviews and critically analyzes existing policies, plans, strategies, and legislation relating to community forestry and agroforestry, and their association with livelihoods and food security in Nepal. Agroforestry and community forestry are considered here as drivers of change and agents for improving food security and livelihoods of local communities in Nepal's Middle Hills. The review specifically focuses on policy instruments pertaining to community forestry and agroforestry, as well as provisions and plans related to food security and livelihood enhancement attributed to forestry.

The study was based on a review of existing and new policy instruments, published research papers, and program documents, as well as interviews with sectoral experts—both state and non-state actors—and field visits. Institutional memory and individual and institutional experience were an important component of all of the studies conducted under the wider project. While individual organizations designed their individual research frameworks and implemented their studies, they collaborated and exchanged literature, and even conducted some interviews jointly in cases where the expert was a primary source of information for the researchers.

Regarding the scope and limitations of the study, this review was conducted from a design and planning perspective that requires testing on the ground to provide a more comprehensive assessment of achievements, impacts, as well as improvements necessary at the implementation stage. Given these limitations and constraints, it nevertheless provides a critical assessment of the policies under review. A key limitation of the study, as pointed out in the previous chapter, concerned the fact that Nepal is yet to formulate a dedicated policy or strategy/action plan for agroforestry as a component of forest policy.

Given that agroforestry was only mentioned tangentially within the main policy instruments, a rich analysis of policies in this area was a key challenge. Related challenges were the lower priority given to agroforestry, conceptually and in terms of programs, structure, and budget allocation, and lack of availability of the most recent literature on agroforestry in Nepal. Whereas agroforestry appears to have been prioritized by the government nearly three decades ago, it gradually lost this traction. Unlike the community forestry cell within the Department of Forests, there is no designated section or division for the promotion of agroforestry, which appears to have been delegated to a “no man’s land” between the Ministry of Agriculture and Cooperation (MoAC) and the Ministry of Forest and Soil Conservation (MoFSC). It was, therefore, difficult to obtain adequate information from key informants.

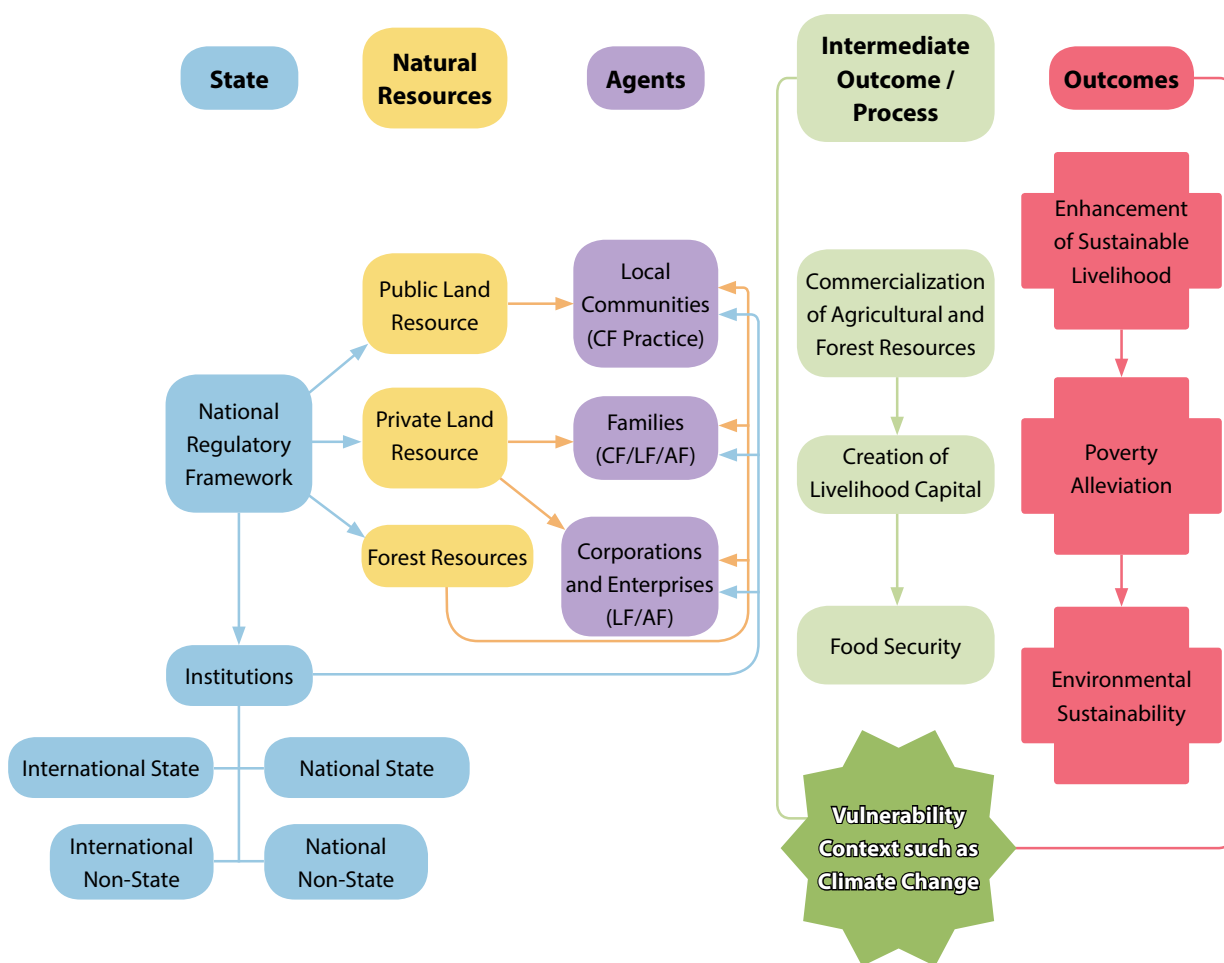


Figure 1. Conceptual framework of the study

2.2 Policy review

This section reviews the following key policy instruments: the Interim Constitution of Nepal and the most recent periodic plans, notably the Tenth Five Year Plan/Poverty Reduction Strategy Paper, and the Three Year Interim Plan. It also covers legislation, action plans, and strategies pertaining to forestry, agriculture, and conservation. For each of the policy instruments covered, the main objectives, issues and provisions pertaining to food security and livelihood enhancement, and strengths as well as existing gaps are discussed and analyzed.

2.2.1 Constitutional agenda

Nepal's prevailing Interim Constitution (2007), which is the country's overarching policy instrument and guide, considers food security as a basic human right and element of social security, and agriculture as an engine of economic growth at national and household levels. It directs the state to "develop the agriculture sector as an industry by encouraging farmers and increasing productivity and by creating conditions for economic progress of the majority of people who are dependent on agriculture." It further emphasizes enhancement of the livelihoods of "marginalized communities, workers and farmers living below the poverty line" through a policy that ensures temporary reservations and affirmative discrimination in acquiring basic facilities, including food security. While the Constitution endorses sustainable utilization and equitable benefit sharing of forest resources, it does not say much on livelihoods or forestry, and does not explicitly mention the role and significance of community and leasehold forestry for livelihoods and food security. Its overarching statements and provisions for conserving forests and forest resources, including biodiversity, through sustainable use appear in a sense to undermine the 30 year long legacy and achievements of community forestry.

2.2.2 Recent periodic plans

(i) The Tenth Five Year Plan (FYP)/Poverty Reduction Strategy Paper (PRSP) (2002–2007)

The Tenth FYP/PRSP was prepared during a time when many key development sectors, including agriculture, forestry, and irrigation, were severely underfunded. The Tenth FYP emphasizes poverty alleviation and most policy recommendations and activities focus on elevating social wellbeing. The plan recognizes agriculture as the backbone of the national economy and recommends prioritizing and refocusing policies and activities regarding agriculture, irrigation, forestry, and power to achieve envisioned targets in agriculture. It identifies with the goals, objectives, and activities that are outlined in the Agricultural Productivity Plan (APP) for the overall promotion of the agricultural sector, and emphasizes agricultural growth and development through technological advancements namely modernizing, diversifying and commercializing crop and livestock production.

The Plan recognizes two important aspects of community and leasehold forestry: 1. promotion of the agricultural sector, particularly promotion of livestock production and compost fertilizers, and watershed improvement; and 2. creation of income generating activities for poor community members. It also acknowledges the microeconomic impacts of the user group approach on local communities, especially women and marginalized groups. While the Plan does not provide explicit and detailed prescriptions to enhance the existing framework, structure, and governance of community and leasehold forests, it does send a message that handing over institutions and forest resources to local communities can be a positive step toward improving livelihoods. The Plan's recommendation on acquiring land through a land bank to enhance the livelihoods of poor communities may, however, be far stretched in the Nepal context.

One of the strengths and specific focus areas of the PRSP is its emphasis on community participation and its recognition of the differentiated roles of different community segments in managing natural resources, including community and leasehold forests for common benefits. However, it is silent on benefit-sharing modalities from the common pool of natural resources among the different strata of local communities. Seemingly, benefit sharing from enhanced community forestry revenues is beyond the purview of the Plan.

Recognizing the importance of land use planning and judicious use of different land categories, the Plan has recommended designing and implementing a land use planning policy, which has been drafted by the Ministry of Land Reform Management and approved, very recently, by the Cabinet. Although the Plan does discuss budgetary allocations and public expenditure in agriculture and forestry, these discussions center on mainstream activities within these sectors.

However, both the periodic plans and the Constitution remain mute on the subject of agroforestry, which is a traditional but tangible approach for increasing agro-based incomes of those highly dependent on forests and agriculture. This suggests two possibilities. Either the government does not consider agroforestry to be a viable income generating source for agrarian communities, or earlier efforts to

promote agroforestry by the Department of Forest Research and Survey did not succeed in gaining much traction. Whatever the case may be, the policies reveal inadequate attention to agroforestry as an area of national interest for the Government of Nepal.

(ii) Three Year Interim Plan (2007–2010)

Given its formulation during Nepal's post-conflict development era, the Three Year Interim Plan (TYIP) can be expected to prioritize state restructuring, peace building, and economic growth over other development agendas. Its target is to achieve overall economic growth at 5.5% with growth of the agricultural and non-agricultural sectors at 3.6% and 6.5%, respectively. Like the PRSP, the TYIP also emphasizes reinforcing APP as the central agricultural development policy through supporting policies and strategies. It considers agriculture as the main driver of development and economic growth in Nepal. However, the forestry sector receives only one fifth of the budget allocated to the agricultural sector. Agriculture and forestry (including community and leasehold forestry) are covered in separate sections as are specialized topics such as food security, land management, and irrigation.

The Plan identifies land fragmentation, dual land ownership, land rights and tenure, unplanned land use, inadequate agricultural supplies, and inaccessibility to markets as the main challenges for meeting envisioned targets in the agricultural sector. Moreover, it endorses increased production and productivity through the combined efforts of technological enhancement and capacity building; agricultural commercialization; self-employment of rural youth; and agro-diversity conservation. Our analysis shows that the Plan prioritizes research, extension, technical capacity development, market linkages, and institutional frameworks over building social capital, community ownership, and reinforcing proven traditional agricultural practices to actually improve livelihood and food security conditions. Provisions for social inclusion and poverty alleviation are pronounced through the implementation, monitoring, and evaluation phases.



EnLiFT Nepal scientists in a discussion in an under-utilised land in Kavre, Nepal | by [Aulia Perdana](#)

Regarding forestry, the TYIP's long term vision for forests pertains to the regular supply of timber, fuelwood, fodder, and other forest products through the formulation and implementation of a sustainable and balanced forest development program. Importantly, it advocates improved inclusion and participation of people, especially poor and marginalized communities in the conservation and utilization of forests beyond timber and fuelwood procurement. Their involvement in forest enterprises to generate income addresses the issue of livelihoods and food security and signals the endorsement of forest user groups; the Plan mentions handing over national forests to local communities. Community and leasehold forests are prioritized along with forest enterprise and forest-based industry as income generating options. Moreover,

by linking the concept of sustainable forest development with food production through “effective interaction between forests and agriculture systems,” and protecting land from natural disasters such as floods and landslides, the Plan approaches the concept of agroforestry.

The Plan highlights several positive aspects of community forestry for improving livelihoods, including improving the implementation process of community and leasehold forestry through policy reforms. It does not, however, adequately capture their key feature as enabling livelihood improvement and food security in poor communities. The TYIP has planned a remarkable nationwide pilot program on “livelihood plan formulation and implementation” linked to community forestry. It reinforces the provisions outlined in the Operational Plans such as allocation of up to 35% of the total community forestry revenue for uplifting the poorest community segments. However, while its stated objective is substantial poverty reduction through community forestry interventions, it contains two conflicting statements in its respective chapters on agriculture and forests. The former states that the expansion of community forests is causing a decline in pasture land and hence affecting the livelihoods of those dependent on livestock. The latter states that forestry has had a significant positive impact on various elements of the national economy, including agriculture.

From this study’s perspective, the most pertinent aspect of the TYIP is a detailed section on food security and its long term vision to “ensure food sovereignty rights of every individual by strengthening in a coordinated way all aspects of food and national security.” The TYIP envisages food security through a mixture of policy reform, better crisis response mechanisms, and a targeted approach for the vulnerable. While it recommends increased production and productivity of forest-based products and agricultural products, it does not identify community and leasehold forestry, or agroforestry practices, as viable options. The Plan recommends formulation and implementation of a “Food Sovereignty Act” in relation to policy and program in four aspects relating to food security: food availability, accessibility, proper use of food, and food stability. It identifies lack of consistent quality of available food commodities, social discrimination in food distribution, inadequate attention at the national level, and unreliability and high costs associated with external factors such as transportation as key issues related to food security in Nepal. The TYIP presents a detailed list of “policies and working policies” for creating food sovereignty and security. This includes identification of and special programs for the most vulnerable and affected regions and communities, institutional arrangements at different levels of governance, coordination among government entities to ensure wider program reach, infrastructure development, more efficient market mechanisms, and better monitoring processes.

(iii) The Three Year Approach Paper (2011–2013)

This ambitious paper, drafted in relation to TYIP, aims to transform Nepal through poverty reduction and achievement of the Millennium Development Goals (MDGs) by 2015. In its design of goals, strategies, and programs, it envisages attaining its goals through employment centric, broad-based economic growth and infrastructure development, with priority sectors being agriculture, export trade, tourism, and industry. It prioritizes increased investment in poorer community segments to ensure basic livelihood elements and food security. It emphasizes agricultural development, with a focus on the market, financing, infrastructure technology, and capacity building, including the introduction of agricultural and rural credit and microcredit to boost this sector and increase food self-reliance. Moreover, it proposes scientific land reform relating to livelihood and food security issues for landless families. Major causes of the slow rate of agricultural growth, identified in the Plan, are: inadequate government investment, little interest from the private sector, lack of supporting infrastructure, and inadequate knowledge and outdated techniques.

In practice, TYIP functions as an “interim policy” for some sectors, including forestry. For example, at the conclusion of the Master Plan, and prior to the introduction of the new plan, the forestry sector has followed TYIP as a guiding policy document. The relevance of this document to the forestry sector is clear, given its recognition of community and leasehold forestry as the main agents of economic development in rural Nepal and its resonance with earlier plans that treat forests as “prerequisites” for the development and improvement of interrelated natural resources, including those relating to agriculture. Thus, community and leasehold forests are seen to have both a direct and an indirect role in livelihoods improvement and food security. On one hand they lead to direct economic improvements through provision of timber and

non-timber products. On the other hand, they are central to the wellbeing of the surrounding ecosystem and water resources, thereby, indirectly enhancing agricultural and livestock productivity. The metric of community enhancement through forests used in the Plan seems to be the number of community and leasehold forest user groups created and handed over to local communities. Its ambitious targets for the handing over of national forests/forest land to local communities can be considered a positive step toward enhancing the livelihoods of local communities. However, the Plan makes no direct mention of how food security can be improved through this transfer.

2.2.3 Sectoral policies

This sector reviews existing policies, regulations, strategies, plans, and guidelines pertaining to the agricultural and forestry sectors.

A. Agricultural Sector

(i) Agricultural Policies

a). National Agricultural Policy (2004)

In line with the Agricultural Perspective Plan (APP) and other sectoral policies, this Policy maintains an emphasis on agricultural commercialization, a sustainable development agenda and the MDGs, and Nepal's commitment to the World Trade Organization and other regional organizations. It specifically promulgates transformation of subsistence farming to commercial and competitive agriculture, thereby empowering local farmers. To promote sustainable commercialization of agriculture that addresses environmental conservation and the MDGs, the policy stresses identification of priority crops, promotion and improvement of local breeds and seeds through the creation of resource centers, and capacity building at all levels of governance and institutions, and of farmers at the local level. Special provisions are provided for poor and disadvantaged community members such as granting land to skilled but landless farmers. The policy advocates a concept similar to leasehold forestry entailing the handing over of wasteland or degraded forest land to local communities for agroforestry and other purposes such as cultivation of fodder, cash crops, and orchards. Its use of the term "agroforestry" is exceptional, and its linkages to livelihoods improvement for the poor and marginalized, and upgradation of land status is commendable.

b) Agro-Business Promotion Policy (2007)

This policy, which emphasizes poverty reduction and livelihoods improvement, aims to reinforce the National Agricultural Policy through legal provisions for transforming subsistence-based and dispersed agricultural production into a package of competitive, commercial, and coordinated agricultural practices. Under this policy, the following activities have been initiated: promotion of growth centers based on geographical, technical, and economic potential; creation of hubs for agro-products and business service centers; and prerequisite infrastructure development, such as irrigation facilities, roads, power, and collection and cold storage centers.

(ii) Agricultural Sectoral Plans, Guidelines, and Strategies

a) The Agricultural Perspective Plan (APP)

Drafted in 1995, the APP aims to radically transform the agricultural sector through technical, political, and financial improvements, constituting it as the mainstay of the national economy and increasing its contribution to the national GDP. It envisages strategies and programs for increasing the agricultural growth rate to 5% per annum (from the 1995 baseline of 2%) and extending the influence of this growth to other non-agricultural sectors, including employment in areas such as the market as service providers, export trade, and in agro-based industries and enterprises in both rural and urban areas. While this growth addresses the entire value chain, the APP specifically envisages opening up economic opportunities for the rural poor, particularly women. It forecasts a decline of the rural poor by 5.5 million during the 20 years of its implementation, thus decreasing poverty from the 49% baseline in 1994/95 to 14%.

While the Plan is oriented towards the role, investment, and contribution of the private sector to achieve its objectives, it also encourages public sector investment and accordingly identifies inputs, outputs, impacts, and implementation elements towards meeting its objectives. These are: 1) to accelerate the agriculture growth rate through increased factor productivity; 2) to alleviate poverty and significantly improve living standards through accelerated growth and expanded employment opportunities; 3) to transform agriculture from a subsistence to a commercial orientation through diversification and the realization of comparative advantages; 4) to expand opportunities for economic transformation by fulfilling the preconditions of agricultural development; and 5) to identify immediate, short-term, and long-term strategies for implementation, and to provide clear guidelines for preparing future periodic plans and programs.

While the APP objectives are forward looking and its strategies are sound in terms of technology, economic growth stimulation, and social and geographical inclusion, it fails to explicitly draw linkages with traditional knowledge and age-old practices such as agroforestry, which is not mentioned in either its objectives or its strategies. This lack of acknowledgement of agroforestry as a practice that requires scientific reinforcement to enhance productivity leading to better livelihoods and food security is surprising given its promotion at a time when the food security situation had deteriorated due to low food grain production, and the promotion of agroforestry was also at its peak at the government level. However, the Plan does promote sericulture and apiculture, which are effectively two agroforestry practices. Further lacunae are the absence of the role and participation of local communities in strategies for promoting the goals of the APP, and of the role of forests in enhancing ecosystems and natural resources, described in the periodic plans. Instead, forests are categorized, along with agro-business, as a priority investment output. An exclusive focus on forests as outputs may not be appropriate given the multitude of benefits that properly managed forests have for the surrounding land and water resources.

Positive aspects of the Plan include its identification of community forestry in the hills and mountains, commercial management in the Terai area; promotion of leasehold and private forestry; and capacity building in the sector as four forestry priorities. Envisaged impacts and contributions to the national economy include poverty reduction, improvement in food security status and the environment, better land use, a specialized role and contribution of the Terai, and hill and mountain agricultural production. To implement the strategies and achieve its objectives, the APP identifies the following “agents of change”: investment primarily from the private sector; favorable public policies, for example, relating to resource allocation; private sector bundling and risk hedging; a proper pricing policy; secure land tenure; and a coordinated and integrated institutional framework and arrangements.

Commencing with the ninth FYP and up to the Three Year Plan (2011–2013), the APP has been regarded as a major policy in all periodic plans from the ninth FYP and inclusive of the Three Year Plan (2011–2013). It recognizes and acknowledges gender differentiated roles and contributions to achieve a “large aggregate impact.” An evaluation found that although the armed conflict affected the effective implementation of the APP, it has nevertheless had positive impacts, including increased involvement of the private and NGO sectors during this period; and institutional changes leading to devolution of agricultural extension and the promulgation of several sectoral policies, such as the Water Resource Strategy (2002), Irrigation Policy (2003), Agricultural Policy (2004), and Forest Act amendment (Samriddhi Foundation, 2011). These three policies are to some extent influenced by APP and have contributed toward the achievement of its goals.

B. The Forest Sector

(i) Forest Policies

a) Forest Sector Policy (2000)

The Forest Sector Policy (2000), which replaced the Forest Master Plan, and its subsequent amendments respond to two identified issues: lack of an institutionalized system for amending or updating policies; and the need for a clear-cut and unique policy for the MoFSC. The Policy outlines the development imperatives, strategies, and programs required to meet its envisioned targets and objectives. Though it has been criticized for having u-turned to conservation and “restrained” community empowerment and

management, its short, medium, and long-term objectives appear to be visionary and people-centric. Its long-term objectives clearly express its intention to contribute to enhancing the livelihoods of poor and marginalized sections of communities through community and leasehold forestry. See Figure 2 below.



Figure 2. Objectives of the forest sector policy (2000)

Of the six thematic areas outlined as policy statements, land use planning, production and utilization, social aspects of land and forest resources, and the role of the private sector and investment in the forest sector are the most salient for this study. The policy underlies the importance of land use planning to “enhance the productivity of the resource base and strike a balance between conservation and sustainable use of natural resources.” The essence of this policy statement, which aims to ensure judicious utilization of productive land to enhance productivity and contribute to the livelihoods and food security of local communities, particularly those that are marginalized and poor, has been captured in the recently introduced Land Use Policy and requires translation into action through appropriate strategies and delivery mechanisms. The production and utilization policy statement similarly identified priority products such as fuelwood, timber, fodder, and medicinal plants from the perspective of livelihoods enhancement. This differentiates management regimes according to geography and forest regions, allowing users to manage the forests and limiting government staff to advisory and facilitating roles, reflecting devolution of power to local communities. This has had a significant empowering impact on local communities. A third policy statement, social aspect of land and forestry resources, emphasizes integrated farming for better soil conservation and watershed management, and refers to potential linkages with agriculture and agroforestry through decentralization for better access and optimal utilization of forest resource.

While the Policy’s intent of eventually handing over all accessible hill forests to local communities as community forests (the first priority), or leasehold forests, is very liberal, this is a slow process as witnessed over the last 30 years. Resonating with agricultural policies, it recognizes the role of the private sector in enhancing the quality of forests to cater for the livelihood needs of the poorest and the landless. It has identified six strategic activities to help these groups, including employment in forest related activities such as nurseries and plantations, capacity building through training, prioritization for allocating leasehold forests employment in agroforestry, and equitable compensation in medicinal and aromatic plants based enterprises. Recent requirements stipulated in the community forestry operation manuals and plans require well-being ranking of communities and prioritization of the bottom ranks when distributing facilities and benefits. These have all had positive impacts on the livelihoods and food security status of local communities.

The Policy’s provision in terms of the government’s allocation from total timber sales, which was reduced from 40% to 15% in 2004, along with the annual determination of allocations for forest management, local development, and pro-poor activities determined from CFUG revenue, has enabled disciplined sharing

under different heads and made CFUG leaders accountable for revenue from forest resources. This has had a positive impact on the overall health of forests and the pace of local development and livelihoods of communities. Access to basic amenities such as drinking water, irrigation, roads, and rural electrification should be regarded as the metrics for evaluating livelihood improvement.

b) Leasehold Forest Policy (2002)

Though introduced in the 1970s, leasehold forestry did not gain traction, perhaps due to less priority from the government and lack of donor funds. The subsequent Leasehold Forest Policy (2002) was promulgated to enable preceding policy instruments such as the Forest Act (1993) and Forest Regulation (1995), and the Master Plan for the Forestry Sector (1989) to translate legal provisions for leasehold practice into action. The Policy has livelihoods enhancement of the poor and disadvantaged through sustainable utilization of forest resources at its core, and includes two components: leasehold forests for local communities and leasehold forests for industries and the corporate sector, including tourism (eco-tourism). It reasserts the co-benefits of shared forest conservation and management responsibility with local communities and the private sector, as mentioned in the Forest Act and Regulation. The Policy importantly acknowledges that implementation procedures for provisions such as converting national forest land to leasehold are complex and not always transparent. A unique aspect of the Policy is that it includes the opportunity to assess the impact of leasehold forestry after its legislation. While it documents the increase in fodder, grass, and incomes after conversion of degraded land into leasehold forests, it notes that the program itself should not be taken as a “means of employment and quick income generation,” but should be coupled with other agricultural and enterprise-based activities such as animal husbandry, small farmer development programs, and cottage industries. Among its key procedural commitments and prioritization for the poor are categorization of land eligible to be handed over as leasehold forests; special and simplified procedural provisions for those below the poverty line; and specific tourism-related activities. Recognizing procedural barriers hindering handing over forest land to local communities under lease, the Policy introduced a decentralized approach, giving the District Forest Officer full authority for this entire procedure, including land identification. The main handover criteria are: the most prioritized target beneficiary; biodiversity and environmental protection; employment opportunities creation; annual royalty and revenue; and soil erosion and natural disaster mitigation. The thrust, however, was on integrated farming practices, coupling forestry with agriculture, livestock, cottage industry, and other income-generating activities.

(ii) Forest Sector Legislation

Forest Act (1993)

The Forest Act, which followed and strengthened the Master Plan and was enacted soon after democracy was restored in 1990, is people-centric and democratic. It completely decentralizes power to local communities via community forest user groups (CFUGs). Forest Rules, formed in 1995 under the Act's jurisdiction entail provisions for enhancing the livelihoods of local communities. These include permission to plant certain short-term cash crops such as medicinal plants in community forests, devolving authority to user groups to fix the price of forest products for their own use, transport of forest products within the country, and punishing user groups' members for violations. This level of autonomy has enabled CFUG to take decisions for the benefit of the entire community.

Managerial rights and decision making over forests are bestowed on CFUGs in one of the country's most progressive Act which has affirmative provisions to empower communities. However, the Act does not address the issue of how food security will be addressed by community forestry, while the provisions on what to plant are not stringent in the case of leasehold forestry. Moreover, while the Act demands equitable benefit sharing from community forestry among members, the reality may differ with the language of the Act being understood by local elites in ways that benefit them and mostly exclude the poor and disadvantaged. If the Forest Act provisions were strictly followed and the District Forest Officer (the main authority in the forest sector at the meso level) arbitrates the judicial implementation of the Act, livelihood and food security conditions in the Middle Hills, where more than 75% of Nepal's community forests are situated, would significantly improve.

(iii) Forest Sector Plans/Guidelines/Strategies

a) Master Plan for the Forestry Sector (1989)

Prepared in 1988 with the objective of providing a long-term vision for planning, a budgetary framework, and overall development of the forestry sector, the Master Plan places the greatest emphasis on handing over national forests to local communities to manage, as demonstrated by community and leasehold forestry. Its long-term objectives are meeting people's forest product requirements sustainably; conserving ecosystems and genetic resources; protecting land against degradation and natural disasters leading to ecological imbalance; and contributing to national and local economic growth.

While the Master Plan maintains forest conservation at its core, it opens up a space for community participation, and is unique in its balance between traditional and "liberal" approaches to forest resources conservation. Its main programs include community and private forestry; wood-based industries; medicinal and aromatic plants promotion; soil conservation and watershed management; national and leasehold forestry; and conservation of ecosystems and genetic resources. It also promotes capacity building and strengthening of institutions, policy and legal reforms, as well as monitoring and evaluation activities to improve implementation. The Plan which has now expired has revolutionized forest management practice through the introduction of the role of communities, and has played a major role in livelihoods enhancement and prioritizing marginalized community members in benefit-sharing modalities. Although the community forestry guidelines prohibit agricultural practices in forests, the concept of sustainable management and harvesting of timber and non-timber forest products remains within the framework of the Operational Guidelines, thereby enhancing the livelihoods of forest-dependent communities.

b) Community Forestry Program Implementation Guidelines

These guidelines assist local communities through the provision of minute details for implementing community forestry. These include supporting user group members, prohibited and permitted actions inside community forests, identification of potential areas for community forestry, contributing in decisions related to community forest revenues, and identifying needy target groups. However, they appear to be mechanical in their approach and implementation and would have been more effective if their provisions for compensating the poor and disadvantaged were more pronounced and alternative livelihood enhancement options such as sericulture and silviculture were included.

2.2.4 Other policies

This section primarily covers recent climate change-related policies in Nepal given the fact that agrarian and forest-dependent communities are among the most vulnerable to the negative impacts of climate change. Forests are seen as carbon sinks that can mitigate these impacts, resulting in the promulgation of Reduced Emission from Deforestation and Forest Degradation (REDD)-related preparations for policy formulation and implementation in Nepal.

(i) Land Use Policy (2012)

The most recent addition to the Nepalese legal framework, this policy aims to encourage "optimal use of land for agriculture amid concerns over food security in Nepal." Accordingly, Nepal's land would be categorized as agricultural, forest, residential, commercial, public, industrial, or "other" to curtail the growing problem of food insecurity attributed to the "fragmentation of fertile land and its haphazard encroachment." The policy strongly stipulates that fertile land should be strictly used for agricultural purposes and encourages optimal use through proper zoning of agricultural land. It also aims to contribute to inclusive social, economic, and environmental development through sustainable use of land and natural resources.

(ii) Climate Change Policy (2011)

This policy earmarks up to 80% of climate funds, particularly adaptation-related funds for local communities as major stakeholders, but treats them as passive beneficiaries of climate compensation. It

would have been more effective and efficient in its delivery if it could have defined different community segments based on their vulnerability and dependence on agriculture and forest resources. A clear outline of roles, rights, and responsibilities of local communities would also empower them as active partners in development (Ojha, 2012).

(iii) National Adaptation Program of Activities (NAPA)

Prepared with the objective of assessing climate change vulnerabilities, identifying focus areas, and adaptation measures, and developing a knowledge management and learning platform and multistakeholder action framework, NAPA is expected to address the complex issues of agriculture- and forest-dependent communities at the “bottom of the pyramid.” However, the relevance and significance of its prioritized activities for implementation have been highly criticized as a likely result of highly centric consultation processes that did not include local communities and governance units. It does not identify local communities that have pioneered forest rejuvenation in Nepal as the implementers in priority areas. Their roles, rights, and responsibilities in executing these activities are not clearly delineated, nor how these activities will benefit them, and the implementation mechanism.

(iv) Local Adaptation Plan of Action (LAPA)

Prepared in response to recommendations and opinions shared by participants at the NAPA Inception Workshop, LAPA is expected to address issues on the ground. Its framework has been designed as a bottom-up, inclusive, responsive, and flexible processes of integrating climate change resilience into local-to-national planning, prioritizing adaptation activities that can be easily adopted by local communities. This ensures a light level of community participation and promises to bring about positive impacts in terms of better resilience and higher adaptive capacities, also catering to the agriculture and forestry sectors. LAPA, now at the pilot stage, is an exceptional policy instrument which has captured the minute details of climate change impacts on local communities. This exercise can develop a nexus between climate change adaptation measures and their derivatives and livelihoods within local communities.

(v) REDD Strategy/REDD Preparedness Plan

Following the finalization of its REDD Strategy in 2013, and the formulation of the REDD Preparedness Plan (R-PP), which is designed to “test drive” the concept in Nepal and consequently feed into the Strategy, Nepal is preparing to implement REDD at the national level. The Strategy is expected to be closely aligned with the upcoming National Forest Sector Strategy and climate change measures to be implemented through NAPA and LAPA. RPP places local communities at its core as the principal agents of change and in the implementation of REDD. However, international reporting, accounting, monitoring, and verification requirements make the process more centralized, raising the question of whether promulgation of this concept might contradict that of decentralization and devolution within existing forestry legislation. Moreover, despite the involvement of local communities in the process and design of RPP, there is a possibility of jeopardizing the authority invested in local communities at the time of implementing the REDD Strategy.

2.3 Institutions

This section only covers those government institutions working in the community forestry and agroforestry sectors. Under the Department of Forests, there are two dedicated divisions: the Community Forestry Division and Private and Agroforestry Divisions mandated to work for the promotion, planning, monitoring, and evaluation of community forestry and agroforestry.

Government agencies are divided into three major categories: planning, decision-making, and implementation.

The following high level government bodies function at the planning level: the Parliamentary Committee on Natural Resources Management; Environmental Protection Council; National Development Council; National Planning Council; and Line Ministry.

At the decision-making level, while there is currently no policy specifically designed to promote agroforestry a few policies have mentioned this as an option or strategic component for increasing productivity and hence contributing to the livelihoods of local communities. Hence there is no dedicated government institution working on agroforestry. The following list refers only to the most closely associated institutions, and not necessarily ones that include agroforestry in their mandate. By contrast, community forestry is an established practice with a robust institutional framework. MoFSC is presently the line ministry for both.

Under the Department of Forests, two dedicated divisions—the Community Forestry and Private and Agroforestry divisions are mandated to work for the promotion, planning, monitoring, and evaluation of these programs.

Table 1. Government Institutions Working in the Community Forestry and Agroforestry Sectors

	Practice	Institution	Mandate
Community Forestry	Ministry of Forests and Soil Conservation (MoFSC)		To formulate of policies, plans, programs, strategies, and amendments as deemed important
		Dept. of Forests	To manage the country's forest resources for the conservation of the natural environment and to supply forest products to the people
		Dept. of Research and Survey	To contribute to conservation, management and sustainable utilization of forest resources through improved technologies and an updated forest resource information base
		Dept. of National Park and Wildlife Conservation	To create buffer zones in and around parks and reserves for the sustainable management of forest resources
		Dept. of Soil Conservation and Watershed Management	To implement integrated package programs that include vegetative, agronomic, and water management measures to tackle erosion problems taking the subwatershed area as the unit of planning, implementation, and management.
		To ensure proper land use by rational land use planning.	
	Ministry of Environment	To approve EIAs carried out on community forests greater than 200 ha.	
	Ministry of Land, Reform and Management	To implement Land Use Planning and ensure that agricultural land is not “misused” for other purposes	
Agroforestry	MoFSC	Dept. of Research and Survey	To conduct research, surveys, and extension programs
	Ministry of Agriculture and Cooperatives	National Agricultural Research Council	To prepare strategies and work plans for the promotion of agricultural productivity
		Agribusiness Promotion and Statistics Division	To decide on and prioritize activities identified by the Agri-business Policy
			To maintain statistics and information related to agribusiness activities
		Department of Agriculture	To support and help achieve food security and poverty alleviation by transforming agriculture through diversification and commercialization
		Department of Livestock	To develop and improve existing livestock farming as the main income source of farm families and help maintain environmental balance and conservation
	To promote fodders trees in private land in collaboration with the Department of Forests		

At the implementation level, district offices such as the district forest offices and district level offices under the Department of Agriculture and Livestock will function as the implementers, decision makers, and planners.

2.4 Study recommendations

2.4.1 Work plans and time tables

Few policies identify phase-wise goals and objectives. A policy recommendation is, therefore, the inclusion of plans and schedules of implementation for activities, along with targeted goals and associated milestones.

2.4.2 Delivery mechanisms

Most policies mention major central level government bodies and do not explicitly identify the delivery and dissemination agents. Those governed by institutions with lower level departments and units, for example, service centers under the Departments of Agriculture and Livestock Services, can outline detailed work plans and delivery mechanisms at each level of governance. This will streamline activities and improve clarity in work instructions, reporting and implementation; empower government entities and ease procedural complexities for the rural poor; and create greater proximity to local communities which contributes to faster and more efficient implementation of policy provisions.

2.4.3 Feedback mechanisms

None of the policies described have a feedback mechanism for local government entities. This is especially useful when amending existing policies or designing new ones and can be affirmative as well as critical. Feedback on the ground relating to implementation challenges is very important for improving policies which are otherwise top down and coercive rather than empowering.

2.4.4 Better synergy among policies

Whereas different policies and their strategies and actions are meant to complement each other, they sometimes compete with each other. For instance, the Forest Sector Policy (2000), Forest Act (1993), and Forest Regulations (1995) delegate authority for managing forests to local communities. However, the REDD Preparedness Plan focuses on carbon sequestration that directly relates to standing and underground/ground biomass which stores carbon. This indicates controls exerted on devolution of power to local communities provided by forest legislation. Further while the Forest Sector Policy promotes cultivation of commercial forest crops by communities, this may contradict the Forest Act (1993) which prohibits certain species and practices within community forests. There is thus a need for better synergy between policies and the implementation strategies and actions embedded within these policies.

2.4.5 Better coordination and cooperation among implementing agencies

Coordination is not limited to physical access to communities, but also includes allocation of resources. Such coordination and cooperation need to extend beyond, between, and among government entities, as well as include nongovernmental associations. In the case of forestry, coordination with the Federation of Forest Users, Nepal (FECOFUN) could contribute to improving relations and dissemination of policy provisions to local communities and vice versa.

2.4.6 Creation of dedicated multistakeholder units

Creating dedicated units comprised not just of policy and decision makers, but also of nongovernmental actors, including community representatives, for enhancing livelihoods and food security of poor communities at central and district levels can help create synergy and wider dissemination of policy provisions. This is also necessary at meso and micro levels of authority to ensure that rules are not

contradictory or parallel. A special focus on poorer pockets within local communities is required, with these units functioning as a bridge between the center and local communities. Such units might help to translate policy provisions and effectively implement strategies within stipulated timeframes.

2.4.7 Mandatory periodic policy reviews

The provision and practice of periodically reviewing policies is lacking, resulting in a situation where newer paradigms such as climate change are not addressed in forerunner policies. Mandatory periodic policy reviews will not only help to ensure timely and appropriate inclusion of such new discourses and national interests, but also help to check the relevance and significance of provisions and agendas set at the time of policy drafting. This is particularly pertinent in the current restructuring phase within Nepal.

2.4.8 External policy evaluation

External policy evaluation is required to assess the effectiveness and impact of policies on target groups. For example, whereas APP was a very well drafted policy with forward looking strategies and programs that were envisaged to govern agricultural development for the next 25 years, it “disappeared” contextually within less than a decade of its existence. To avoid such failures and keep abreast of the national development agenda and goals, external evaluations of national policies will be useful for ground testing them and measuring their real impacts.

2.5 Conclusions

Food security and livelihood enhancement through interventions in community led forests (including leasehold forests) and agroforestry targeting the landless poor remain a caveat in all of the national policies described. They are all premised on the belief that food security can be attributed to low productivity and that targeted groups have land/secure land tenure. They further assume that benefit sharing from community led forests is equitable. Major national policies do not address the well- established nexus between land tenure insecurity and landlessness and poverty and food insecurity.

The effectiveness and impact of any policy is measured either through programs initiated or changes in livelihoods, development, and human development coefficients and indices brought about by the policy. In the case of policies related to community forestry and agroforestry, the metrics of evaluation are enabling legislation formulated in association with policies, programs developed and implemented either by the government or donors, level of implementation and extent of dissemination at different levels of governance, qualitative and quantitative participation of local communities, the nature and type of target groups/beneficiaries, and assessment/evaluation of the policies and programs. The strength and effectiveness of a policy does not depend as much on how well written or comprehensive it is. Rather, the determinants are which actions or agenda are “picked” by the resource allocators, and which “interests and intentions” drive these policies. A very well written, comprehensive and forward looking policy such as APP and pertinent policy objectives such as agroforestry are gathering dust because the strategies and goals were not “saleable.” The current drive to amend the Forest Act and formulate an Agriculture Development Strategy has also been criticized as being fueled by “special interests” and “vested intentions” rather than responding to real needs. Hence policy and decision makers need to pause to reflect and understand undercurrents before developing, revising, and amending policies, legislation, and strategies.

CHAPTER THREE: MAPPING THE INSTITUTIONAL LANDSCAPE OF COMMUNITY FORESTRY AND AGROFORESTRY IN NEPAL

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3.1 Introduction

This study conducted stakeholder consultations to identify key institutions engaged in community forestry and agroforestry systems in Nepal. It discusses their roles and contributions at different times, focusing on their programmatic areas, geographical coverage, major activities, and performance in promoting agroforestry and community forestry. It further explores their potential in terms of their resources and value addition in developing these systems, and their contribution to local livelihoods and promoting food security in Nepal's Middle Hills.



Under-utilised land in Kavre, Nepal | by Aulia Perdana

These institutions can broadly be divided into seven functional categories: government institutions; donors/INGOs; NGOs; research and academic institutions; local communities and their networks; civil society actors; and the private sector. They have evolved over time and have different roles and responsibilities, influences and contributions to agroforestry and community forestry at micro, meso, and macro levels.

Specific objectives of the study were as follows: 1) To identify organizations involved in agroforestry and community forestry, and their scope; 2) to identify the existing programmatic and geographic focus of each organization and their capacities, strengths, and weaknesses; 3) to explore gaps in research and development activities related to the roles of agroforestry and community forestry in enhancing livelihoods and food security; and 4) to compile a list recent material produced by each organization of relevance to enhancing livelihoods and food security.

The study was based on a desk review of the materials as well as consultations with key informants and the findings of a consultation workshop held with key stakeholders. A literature review was conducted on actor and stakeholder analysis and institutional mapping to develop a framework and approach for the study, which aims to identify the potential of institutions engaged in agroforestry with a particular focus on promoting local livelihoods and food security using functional categories of institutions.

The chapter is organized as follows. The first section provides an overview of stakeholders and an actor analysis framework, as well as a brief discussion on agroforestry in Nepal. Next, key institutions are identified and their areas of involvement and influences. The chapter then briefly describes the emergences of actors in agroforestry in Nepal, followed by a discussion of key agroforestry interventions. Subsequent sections describe the scale, areas, and scope of these institutions, their strengths and weaknesses, collaborations, gaps in research and development activities, and relevant resources that they provide in promoting agroforestry practices. Finally, the chapter offers conclusions on the study.

3.2 Literature review

3.2.1 Stakeholder analysis and institutional mapping: a conceptual overview

Stakeholder analysis, wherein actors, stakeholders, and institutions are identified along with their roles, responsibilities, influences, and performances is required for research and/or development interventions aimed at bringing about social change. A stakeholder in this context is defined as a person or group who have a “stake” in the change and whose interests and activities strongly affect or are affected by the concerned issues. As they control relevant information, their support is required for successful implementation of the program.

Stakeholder analysis thus identifies the stakeholders and maps out their relative power, influence, and interests in a particular domain or regarding a specific initiative. It identifies each stakeholder’s role and action arena, and indicates the relative priority given to meeting their interests, thus assessing their importance to the success of the project or program (Morgan and Taschereau, 1996, p. 2 cited in Aligica, 2006). The aim of a stakeholder analysis is to develop cooperation between stakeholders to ensure successful outcomes of a project or program before its initiation.

Institutional mapping is similarly defined as analyzing institutions, including policies in a particular domain. A classic example is the Institution and Development (IAD) framework relating to the governance of common pool natural resources developed by Ostrom (2011). This framework suggests that as institutional arrangements change, people change their behavior toward natural resources, which often impacts on the resource base (Ostrom, 1990).

Mapping is a basic tool for understanding the potential roles of involved stakeholders and institutions, and for identifying potential coalitions of support for the project, strategy building, and assessing relative risks entailed. When carried out with the participation of stakeholders, it builds legitimacy and policy ownership.

Common methods used for stakeholder mapping include classification of stakeholders based on the power to influence (Mitchell et al., 1997), value hierarchies and key performance areas (KPA) (Fletcher et al., 2003), and ranking needs and the relative importance of stakeholders to others in the network. Stakeholders have also been mapped to assess the potential for cooperation, and as a strategy for communication (Savage et al., 1991).

Irrespective of how social actors are defined, their relative power, influence, and interests are profoundly determined by the institutional environment. Thus stakeholder mapping and institutional mapping are not two separate procedures. Rather, they are two faces of the same coin, or two dimensions of the same analytical domain (Aligica, 2006).

3.2.2 Agroforestry and community forestry in Nepal

The agroforestry practice of integrating and managing crops, livestock and forestry for food security and livelihoods has a long history in Nepal's Middle Hills (Gilmore and Fisher, 1991; Hobley, 1996; Garforth et al., 1997). However, its conceptualization as a strategy for meeting the needs of local communities and protecting the environment against degradation (Eckholm, 1975) began in the 1970s when several popular kinds of "forestry" such as social, farm, rural, community, and agro were spawned (Tamale et al., 1995; Nair, 1993; Foley and Barnard, 1984), technically defined and distinguished, and used in different contexts (Barracough and Ghimire, 1995).

From a technical perspective, Nepal's agroforestry practices can be broadly categorized as: farm-based and forest-based. The former include home gardens, trees on or around agricultural fields, wood lots and commercial crops under shade trees, and intercropping of agricultural crops and commercial trees. The latter include specific forest-based agricultural practices entailing collection of food, fruits, and gums (Tejwani and Lai, 1992). These categories have important implications, particularly through the division of the institutional landscape, including targeting communities, institutional involvement and long-term programs and strategic approaches.

Perceptions and meanings imparted to agroforestry also differ. Many institutions simply take a technological approach to enhancing the productivity of natural resources (Garforth et al., 1997). Accordingly, while foresters perceive it as planting trees and other forest species in farm land, agriculturalists perceive it as integrating farming, livestock, and forestry to enhance agricultural productivity; a view that contradicts prevailing policies and practices entailing agricultural modernization through high input monoculture. This approach compartmentalizes the concept of agroforestry between agriculture and forestry, creating a rigid boundary between them.

By contrast, the scope of community forestry has been widened to benefit all categories of forest dependent communities. Its definition has been broadened as a village level forestry activity implemented on common land that is collectively decided and implemented by the community which manages and harvests forest products and obtains livelihood, food security, and other socioeconomic and ecological benefits from the forest (Martel and Whyte, 1992).

Land competition and the imperative to address the effects of climate change through appropriate agro-ecological management systems have reinforced the need for a broader conceptualization of agroforestry that brings together farms and forests within a sustainable natural resource management system to collectively address issues of food security, local livelihoods, and agro-ecological issues. In this study, agroforestry is defined as an integrated farming system¹ that promotes regenerative agriculture and forest ecosystems for food security, sustainable livelihoods and environmental wellbeing. The stakeholder mapping described in the following sections follows these concepts in assessing the roles, contributions, influences, and performances among stakeholders, while also assessing their potential collaborations and identifying research gaps.

1 *There are various agroforestry practices based on biographic regions. This can be classified as: agrosilviculture, silvo-pastoral, agrosilvopastoral (Amatya, 1994) as well as community-based forestry practices for enhancing livelihoods and food security.*

3.3 The institutional landscape for agroforestry in Nepal



Agroforestry entails the integration of farms, forests, and other natural resources for multiple benefits. It engages multistakeholders and accommodates multiple interests. Therefore, it is important to understand the changing landscape of actors over time, as well as their interests, behavior and attitudes so that a partnership program can be effectively designed and implemented. As stakeholders² influences impact greatly on program outcomes, the analysis includes various dimensions of the stakeholders such as their rights, power, influences, support, services, needs, and priorities that can contribute to understanding the current situation as well as scoping for potential future collaborations.

This section describes the functional categories of stakeholders and institutions that are mandated to engage in and promote agroforestry. In the next section, we will see how these institutions emerged during a period of agroforestry intervention.

Broadly, the institutions that promote agroforestry in Nepal can be divided into seven functional categories: 1) government institutions, 2) donors/INGOs, 3) NGOs, 4) research and academic institutions, 5) local communities and their networks, 6) civil society actors, and 7) the private sector.

These institutions have evolved over time, engaging in agroforestry systems at the micro, meso, and macro levels. Their roles and responsibilities, influences, and contributions in different timelines have differed, and they continue to exist in various institutional forms. There are overlaps in institutional identities, roles and functions as some institutions such as government agencies and NGOs have multiple identities and mandates to play multiple roles. This categorization will help us to better conceptualize a stakeholders' approach to agroforestry.

3.3.1 Government ministries, departments and corporations

In principle, public sector institutions, including general government departments and public corporations involved in environmental resource management, are responsible for policy formulation, regulation and monitoring, as well as implementing public policies related to agroforestry. Their implicit role has been to provide services and inputs for the management of resources through a bureaucratic structure. However, this situation is changing through state collaborations with other private and civil society organizations.

In Nepal, the main government ministries that have a stake in agroforestry are the Ministry of Forests and Soil Conservation (MOFSC), the Ministry of Agriculture Development (MOAD), and the Ministry of Land Reform and Management (MOLR). However, in practice, MOFSC and its departments are particularly active in agroforestry management activities. Within the MOFSC, the Department of Soil Conservation and Watershed Management (DSCWM) is engaged in agroforestry activities, whereas the Department of Forests is responsible for promoting community forestry.

² There are two main types of stakeholders. Primary stakeholders (right holders) are ultimately affected by a development intervention. Similarly, secondary stakeholders (duty bearers) who act as service providers have a significant role in shaping development actions but are not themselves affected by the actions. Another category could be seen as the key stakeholders who take the primary stake of the actions whether they fall into the first or second category.

Officially, MOFSC works in close collaboration with the National Planning Commission (NPC) regarding policies, plans, and programs and with the Ministry of Finance for budget-related issues. It is also responsible for drafting forest legislation in close consultation with the Ministry of Law and Justice.

Currently, community and leasehold forestry are the leading government programs involving agroforestry. Though the agriculture ministry has a major role in regulating and providing services to agricultural farms and private land management, it does not have a specific program to promote agroforestry. The Department of Agriculture promotes fruits trees as a component of horticulture development. Similarly, the Livestock Department of MOAC promotes fodder trees in private land in collaboration with the Department of Forests. The tea promotion board under MOAC helps tea estates that are privately owned and specifically practice agroforestry through intercropping of tea plants with shade-bearing trees on a large scale.

These departments function in isolation and seek control over their respective domains rather than facilitating agroforestry in a holistic manner. There are policy provisions for multisector and multistakeholder approaches to development. However, these are not effectively practiced. For example, a multistakeholder forestry program has been recently developed to manage donor funds, but has not yet been fully implemented by the donors themselves as well as by the forest bureaucracy.

Other institutions include development companies, various boards and banks such as Nepal Resin and Turpentine Industry, Herb Production and Processing Company, Forest Products Development Board, and the state-owned Agriculture Development Bank. There are also state-led research and academic institutions such as the Department of Forest Research and Survey (DFRS), and National Agriculture Research Council (NARC). However, they are not actively engaged in agroforestry programs.

3.3.2 Donors/INGOs

The major role of these international development agencies as financial resource providers in Nepal's development has been recognized. However, their position and influence are superior and hegemonic compared with existing national policies and programs. This occurs in terms of the technical assistance and some financial provisions that they provide in development programs.

Donors have established and maintained their identity as the principal actors through the provision of resources such as money, human resources, expertise, ideas and materials. For example, over the past 40 years, they have introduced diverse ideas in agroforestry ranging from tree plantation and conservation in the 1970s and 1980s, user group formation and capacity building in the 1990s, and pro-poor livelihoods and inclusive growth in the early 2000s.

Many donors support both food security and community-based forestry programs but in isolation. While the restoration of forest cover and improved governance through community forestry has been successful, these programs have not been effective in producing meaningful outcomes in terms of local livelihoods and food security (Campbell, 2011; HURDEC, Hobley and ERI, 2012).

Donors are also the major actors in agroforestry because they mobilize funds for agriculture and forestry development through the design and implementation of their field projects, while also shaping policy debates. Donor involvement in agroforestry and particularly community forestry programs is significantly higher as they provide 80% of the total annual development budget for this program (Khadka, 2009). Earlier, the World Bank, United States Agency for International Development (USAID), CARE, GTZ (German Technical Cooperation), the Swiss Agency for Development and Cooperation (SDC), and AUSAID (Australian Agency for International Development) were heavily engaged in Nepal's community forestry program and more than 12 donors with a wide diversity of approaches were involved in this program between 1970 and 2005. As of 2006, 70 out of 74 district forest offices had received some support from donor-funded projects (Khadka, 2009). However, the program is currently being supported by just three major donors: SDC, UK Department for International Development (DFID), and Finnish International Development Agency (Finnida).

3.3.3 Service delivery organizations (NGOs)

NGOs in Nepal have multiple faces; service delivery, capacity building, activism, and lobbying as well as policy research and advocacy. However, as NGOs, community-based organizations (CBOs), and service delivery organizations (SDOs), they are mostly viewed as the key actors delivering developmental services including capacity building and community mobilization.

Many of them are engaged as service deliverers within donor-funded field projects. NGO involvement in project delivery has increased since 2001 when donors changed their operational strategy during the political insurgency, and also following the Paris declaration on the role of aid agencies in national development. Although the genealogies of these institutions differ greatly, some evolved from donor funded field project interventions and some began to engage in agroforestry. Currently, ANSAB, LI-BIRD, and ForestAction provide community forestry services, while CAED, NAF, NPG and Eco-centre are active in farm forestry. These are among the active NGOs delivering services to agroforestry programs.

These institutions work closely with meso institutions and are directly involved with communities in partnership with various government programs, donor-funded field projects, universities, and INGOs to provide services in the field. Despite their comprehensive understanding of the local situation and needs and priorities of the communities, they hardly influence policies and plans, though they are aware of power relationships, gaps, and issues. Unfortunately, instead of challenging the policies, plans, and implementation modalities, they tend to focus on advancing their own organizations, and establishing their role as service providers among donors and other resource organizations.

3.3.4 Research and academic institutions

Many academic institutions are closely associated with agroforestry in Nepal, mostly encouraged by donor-funded field projects and collaborative research with international research institutions and universities. These include: Tribhuvan and Kathmandu Universities, the Institutes of Forestry and of Agriculture and Animal Science, Kathmandu Forestry College, and Himalayan College of Agricultural Sciences and Technology (HICAST). Similarly, the agriculture and forestry government agencies have sectoral research wings. There are also some professional bodies such as the Nepal Foresters' Association (NFA) that are engaged in agroforestry research.

Some international organizations such as ICIMOD and ICRAF also carry out occasional research, but lack consistent engagement in this sector.

All these institutions engage in various technological and socioeconomic studies. However, they lack their own initiatives or programs to promote agroforestry. They carry out collaborative research activities and work independently provided that grant money is available. NAF has many trial plots in the working districts.

3.3.5 Local communities and their networks

Small-holding farming communities and forest-dependent communities are the right holders in agroforestry. These communities have been organized into community and leasehold forestry users groups, and for many other projects. FECOFUN, a national users' network, is active in raising use rights issues and policy advocacy in the forestry sector, while the National Farmer's Forum (NFF) a coalition of farmers' associations and the National Land Rights Forum (NLRFF) are active in raising farmer's issues. They have significant potential to influence agroforestry policy and practice by reorienting themselves towards livelihoods and food security with which they are not explicitly concerned.

3.3.6 Private sector

The private sector's traditional role in environmental resource management has mainly focused on exploiting natural resources. However, their collaboration in research and development is important for dealing with the changing social and political environment.

Private sector entities range from profit-making companies to emerging not-for-profit companies in both the agriculture and forestry sectors and can be considered as entrepreneurs in the agroforestry field. These institutions, for example, Alternative Herbals, Gorkha Aurbed, and private saw mills mainly contribute by developing production technologies, processing and marketing of agroforestry products including timber and NTFPs. Their role in promoting a business environment is crucial, and some have established community-based processing units and are engaged in fair trade businesses. Local households with trees on their farms, and CFUGs are now increasingly selling their forest products to private processing units or middle men. These households obtain an income from the sale of mainly timber products. CFUGs spend their income on forest conservation, livelihood promotion, and community development.

3.3.7 Civil society actors

Civil society actors represent a wide range of interests and ties and can include community-based organizations, indigenous people's organizations, and NGOs. Functioning with strong interests and public pressure, civil society actors can exercise their legal rights to facilitate the implementation of resource management plans, particularly land management plans based on inclusiveness and participation. Their aim in environmental resource management is to promote the decision-making process by means of public participation.

However, these civil actors have a weak role in agriculture, forestry, and natural resources governance. Most of the civil society groups consider environmental governance as a technical issue and are engaged as service providers. So far, the role of civil society, including NGOs and federations of indigenous communities, has been limited in agroforestry. However, with the legitimacy to participate in policy process, they can facilitate communities and their networks to improve their agroforestry practices.

3.4 Emergence of actors in agroforestry: a historical perspective

Planned state intervention in natural resources management began in the 1950s as a form of social engineering of resource governance whereby the state centrally managed farm forest resources using technical approaches that undermined diverse traditional adaptive approaches to nature use and conservation. During this period, the state failed to recognize the agency of local communities in governance and management and the multiple roles of forests in local production systems. This only occurred later when new institutional forms and mechanisms were created using a wide range of approaches within donor-funded field projects.

However, donors' sectoral development policies and linear approaches to farm forestry created a disjuncture between sectors, furthering misperceptions of traditional agroforestry systems. Interrelations between farms and forests were further disrupted through the strict boundaries created between them and the continued strengthening of sectors in isolation from each other.

Although agroforestry and community forestry timelines vary, four phases of agroforestry development can be identified: an initial phase, development phase, maturity phase, and sustainability phase.

Table 2. Stages of agroforestry and community forestry development in Nepal

Approaches/phases	Initial phase	Development phase	Maturity phase	Sustainability phase
Agroforestry	70s	80s	90s	00s
Community forestry	80s	90s	00s	010s

3.4.1 Initial phase

The people-centered forest management approach began to take shape in the 1960s and early 1970s with the conceptualization of social forestry, agroforestry, and community forestry which were included within the ambit of donor sponsorship from the late 1970s. This shift reconfigured priorities as well as the institutional landscape. While the initial focus was on integrating forestry with farmers' needs, these relations were undermined by timber-based forestry.

Although agroforestry is a traditional practice and traditional institutions still exist in Nepal's Middle Hills, the emergence and growth of agroforestry institutions was mainly fuelled by donor-funded projects in the name of social forestry during the 1970s. These were initiated in collaboration with the Department of Soil Conservation and Watershed Management (DSCWM) which had managerial responsibility. Agroforestry was a major thrust in the 1980s, Kulekhani being a successful example, and various projects supported by donors and INGOs carried out a range of activities including policy formulation, research, capacity building, and field demonstrations. The country-wide promotion of dairy farms had a lot to do with fodder plantation in the 1970s and 1980s.

3.4.2 Development phase

The Community Forest Development and Training Project, initiated in 1980 with funding from the World Bank and technical assistance provided by the Food and Agricultural Organization (FAO), was a forerunner, along with a community forestry project initiated by Australia (1978). UK, Denmark, Finland, and the US (1980), and Switzerland also initiated community forestry projects around this time.

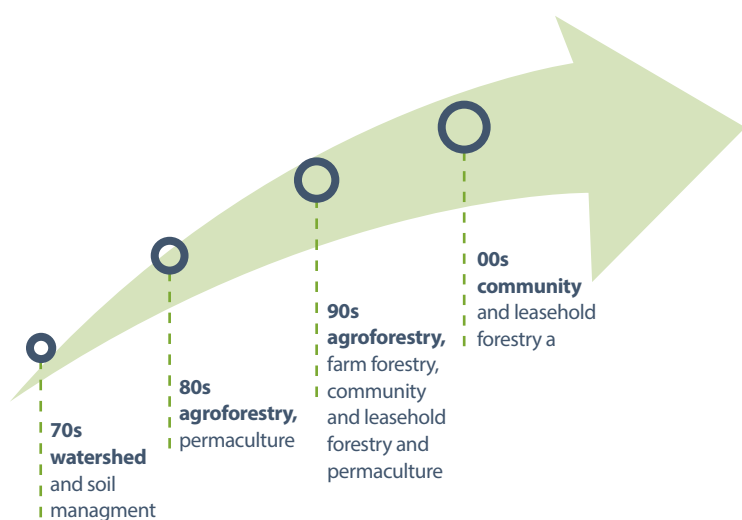
During this period, various international aid agencies supported a number of agroforestry projects in different districts. These agencies included DFID, SDC, GTZ, Netherlands Aid Agency (SNV), USAID, Danish Development Cooperation (DANIDA), and AUSAID. Several INGOs were also actively engaged in promoting agroforestry in the country. These included ActionAid, CARE, Center for International Studies and Cooperation (CECI), International Union for Conservation of Nature (IUCN), United Mission to Nepal (UMN), the Norwegian Save the Children (Redd Barna), and World Neighbors.

Within Nepal, the Institute for Sustainable Agriculture Nepal (INSAN) and the Nepal Agroforestry Foundation (NAF) have been the leading NGOs promoting agroforestry since the 1990s. However, NGOs have only played a role in community forestry since 1992 with their inclusion as implementers in community forestry projects by GTZ. From 1996, SDC also began to involve local NGOs as service providers with a major role in assisting the Department of Forests (DoF) in the districts. NGO involvement in project delivery increased after 2001 when donors changed their operational strategy following the political insurgency. Currently, donors as well as all international agencies work in partnership with service delivery NGOs in light of the Paris Declaration of 2008 on the role of aid agencies in national development.

3.4.3 Maturity phase

This was a consolidation phase of agroforestry development practices entailing a geometrical growth of institutions/organizations and their engagements. Donors, government institutions, and INGOS were very active in promoting agroforestry. Moreover, national research and academic institutions were significantly engaged in agroforestry, though this was limited to partnerships within donor-funded projects since they did not have their own plans and resources. During the 1990s, the Institute of Forestry collaborated in the Agroforestry Project and the Department of Forest Research and Survey (DFRS) collaborated in the Terai Community Forestry Development Project (TCFDP). NAF too collaborated with universities in the UK and the Natural Resources Institute (NRI), while DFID funded the Lumle (Kaski) and Pakhribas (Dhankuta) agricultural centers that were also engaged in agroforestry field research and innovation. However, while INGOs involved in the development phase have continued to implement agroforestry projects in various parts of the country, very few NGOs have promoted agroforestry since the mid-1990s, exceptions being LI-BIRD, ForestAction, and Forward since 2000.

3.4.4 Sustainability phase



Many have observed that despite its potential, agroforestry has never been highly prioritized in Nepal's agricultural and forest development policies and plans (Shah, 1996). During this phase, the thrust on agroforestry was lost with the introduction of monocultural agriculture and a reductionist approach to biodiversity conservation from a wider focus on nature conservation. However, a populist approach to community forestry continued to be promoted through supportive policies and legislation.

Consequently, institutions that were actively engaged in agroforestry during the 1980s and 1990s shifted toward a rights-based approach (RBA) as a result of more emphasis being given to nontechnical aspects of development during the 1990s and 2000s. This was triggered by changes in global discourses on participation, and inclusion and rights of actors, as well as changes in national policies and programs.

These initiatives led to the development of the frameworks of current community and leasehold forestry programs. While agroforestry activities were initiated through donor-funded field projects, they did not continue after the handover of forest areas to user groups in community and leasehold forestry, which are ongoing, though driven more by a forest management perspective than by an integrated agroforestry system.

Small scale scattered efforts in organic farming, permaculture, tree planting in farms and forests and promoting NTFPs in both forests and farms have given consideration to agroforestry, while farmers have developed a local/indigenous knowledge base on tree-crop interaction through their experience (Thapa et al., 1995).

Once again, in the context of recent global debates on food security and climate change, the agroforestry agenda has been revived and revisited as a potential approach for addressing these issues. Mega initiatives such as the Global Agriculture and Food Security Program (GAFSP), the International Fund for Agricultural Development (IFAD) food security project, and Feed the Future programs are illustrative examples.

More recently, private companies and civil society actors are emerging institutions in the agroforestry field. Apart from community and leasehold forestry user groups that promote agroforestry, there are around 1,200 farmer-initiated organic farms spread across the country that also promote agroforestry.

3.5 Key intervention areas in agroforestry

The four main focus areas of work carried out by institutions promoting agroforestry in Nepal are: regulating and monitoring; research and policy advocacy; capacity building; and improvement of production and processing technologies and marketing. These are described below.

3.5.1 Policing, regulating, and monitoring

Given the lack of an economic policy on food security, agroforestry is a weak policy instrument in this regard. There are separate strategic plans for agricultural development—the Agriculture Perspective Plan (APP 1995–2015) and the recent Agriculture Development Strategy (ADS)—and forestry, notably the

Master Plan for the Forestry Sector (MPFS)) of 1988. Various agriculture and forestry-related acts, laws, and guidelines are in place to facilitate their implementation. However, there is no strong linkage between these two sectors since their policies have been framed in isolation.

Policy crafting, regulating, and monitoring are the functions of government ministries. MOFSC, MOAD, and MOLD each have roles and responsibilities in policy formulation, regulating, and monitoring agroforestry programs. However, while MOFSC is active, other ministries have limited functional roles given that the sole authority for forest sector management lies with MOFSC.

While ICIMOD and ICRAF are working internationally in agroforestry promotion in the region, and are also engaged in policy crafting and monitoring from regional a perspective, their role in advancing agroforestry policies in Nepal is virtually non-existent.

3.5.2 Research and policy advocacy

From the inception of agroforestry interventions, there have been a number of research and academic institutions that have been periodically renamed and restructured to provide quality research services. However, given that their research initiatives have been funded by donors, their priorities have shifted accordingly. Presently, they only carry out limited research activities independently. Agriculture and forestry students do conduct field studies to fulfil their degree requirements.

National level research and policy advocacy initiatives are relatively new. ForestAction is actively engaged in this area while other organizations such as LI-BIRD, NAF, NPG, and CAED are building their capacities through intensive field studies. Research and policy advocacy are carried out collaboratively with international universities, research institutes, and organizations such as DFID, ICRAF, ICIMOD, and the International Development Research Centre (IDRC).

3.5.3 Building capacities and promoting awareness

Most capacity- and awareness-building activities occur within donor-funded projects with major service providers in the forestry sector being FECOFUN, HIMAWANTI, and COFSUN. Some NGOs offer regular local courses on permaculture, organic farming, NTFPs, agroforestry, and improving governance. These include NPG, NAF, ANSAB, ForestAction, Eco-Centre, and HASHERA.

3.5.4 Production, processing and marketing

There are numerous country-wide farmers' initiatives at the individual and cooperative levels to improve agroforestry practices ranging from improving production technologies, processing, and marketing. Donor-funded projects in the agriculture and forestry sectors also entail partnerships with NGOs and private companies. Nepal's Microenterprise Development Program (MEDEP) and INGOs such as Practical Action and Care Nepal are actively involved in improving production technologies as well as supporting processing and marketing of agroforestry products.

Several NGOs are also similarly involved. These include ANSAB in NTFP processing and marketing; LI-BIRD in improving agro-biodiversity and agriculture technologies; the Center for Rural Technology in improving intermediate technologies; NAF, FECOFUN and ForestAction in social institutional development and networking; and Alternative Herbs in NTFP processing and marketing.

3.6 Scale, areas, and scope of work

During the 1980s and up to the mid-1990s, both the hill and the Terai districts were well covered by agroforestry programs which were implemented in more than 30 pocket areas of which 25 were in the hills (Denholm and Rayachhetry, 1990; Evans, 1990). Subsequently, the key agroforestry programs launched were community and leasehold forestry that currently cover 73 and 37 districts, respectively. Agroforestry

practices within these programs differ according to local contexts with leasehold forestry being more focused on agroforestry practices compared with community forestry. Agroforestry practices are more prevalent in the Middle Hills compared with the mountain and Terai regions.

Though poorly documented, previous agroforestry work at micro, meso, and macro levels, and according to the four focus areas discussed in section four, are retained in institutional memories. There is considerable evidence of the significant impacts of agroforestry practices in farmers' fields (Kafle, 2012; Garforth et al., 1999; Amatya, 1994; Amatya and Newman, 1993). An agroforestry technique known as sloping agricultural land technology (SALT), promoted by ICIMOD, was widely replicated in the 2000s and is still used by farmers. This has implications for land-use policies such as avoiding intensive cereal cropping on slopes. The Watershed Conservation Act (1982) has good land use provisions for soil conservation that have never been implemented.

The scale of agroforestry and its coverage in the past suggest that there is scope for scaling up and extending agroforestry by building on institutional memories and strengths. However emphasis should be given to sustainability issues relating to all aspects and levels of agroforestry practices, which require coordinated efforts to mobilize the strengths of organizations currently engaged in this area.

3.7 Strengths and weaknesses of actors/institutions

Through their implementation of agroforestry programs at various levels, and in the focus areas, the key actors, institutions, and stakeholders have gained rich experience in this field. While strengths are not equal, a key one is human resource capacities and expertise relating to agroforestry production technologies. Policy research advocacy and capacity building support for communities is another strength acquired by many professionals. Through small scale but continuous engagement with agroforestry under various banners, many organizations have developed capacities, knowledge, and skills regarding both the social and technological aspects of agroforestry.

Well established areas of agroforestry interventions include social mobilization, awareness raising, networking, and capacity building. Small scale experimentation and demonstrations on the technological aspects of agroforestry are also ongoing. Collaboration and networking are a further major strength among agroforestry actors and stakeholders.

However, there is a lack of proper documentation of this scattered, isolated, and small scale experimentation across the country. There is also limited coordination among the stakeholders at the field level. Setting their funding priorities is another key agenda of the institutions, with local institutions lacking sufficient financial as well as human resources. As a result, institutions prioritize their agenda according to funding availability and service demands which forces them to periodically revise their working approaches. Many of the institutions have been observed to change their priority areas, often to the detriment of an agroforestry agenda.

3.8 Collaboration in advancing agroforestry

Agroforestry is an integrated approach for managing the farm and forest interface in changing socioeconomic and ecological contexts. However, stakeholders and institutions follow an isolated and compartmentalized approach regarding agriculture and forest management. Thus, collaboration among stakeholders to promote agroforestry is important.

There is evidence of significant potential for promoting agroforestry in Nepal. Policies and practices have improved, and there are many institutions with their institutional memories and continuing agroforestry initiatives that have advanced knowledge and skills in various aspects of agroforestry value chains. Whereas earlier agroforestry was the domain of international research and academic institutions, there are now multistakeholder forums for shaping policies and increasing knowledge and skills in capacity building and policy research and advocacy. Local processing and marketing of agroforestry products have also increased in collaboration with local communities.

However, there is a wide knowledge gap between researchers and farmers resulting from conventional modes of knowledge generation and utilization. Therefore, it is necessary to engage all potential institutions that can play a significant role in narrowing this gap. Collaborations among the various categories of institutions and a balanced approach are vital for developing, scaling up, and extending the agroforestry. Forging interdisciplinary teams through combinations of conventional scientific communities (agroforestry research specialists) working on various aspects, civic groups (lobbying and advocacy), the private sector (production, processing and marketing) and government institutions (regulating and monitoring) is required. "Integration and innovation" in agroforestry is possible through the adoption of an integrated "one program approach" implemented in forests, private, and public agricultural land at all levels (micro, meso and macro) and across sectors.

3.9 Gaps in research and development activities

There have been radical shifts in Nepal's social, institutional, and biophysical landscapes, particularly in rural areas. Migration and a remittance economy, community forestry and the effects of climate change, and expanding regional economies are the key drivers of these changes that impact more on the rural poor and marginalized, and women, who depend on forests for their survival. While these changes are evident, apart from periodic surveys and the agriculture census, there have been no long-term assessments of this changing context. Consequently, broader socioeconomic research to understand changing landscapes of resource governance, tenure rights, and institutional development in the agriculture and forestry sectors is critical at this juncture.

Institutionalization of agroforestry knowledge is a major gap in research and development in the field of agroforestry, with lack of recognition of agroforestry research, and a lack of progress in technical knowledge that has been hit by the brain-drain. Combining traditional and science-based knowledge in this field is also lagging and agroforestry professionals function more as social development specialists than technical experts. There has been a decline in previously held technical knowledge on suitable species for agroforestry and community forestry.

Agroforestry, in contrast to community forestry, lacks separate policies and programs despite agreement, in principle, on the importance of agroforestry for better integrated natural resource management. The main reasons for lack of progress on developing a national agroforestry policy are shifts in donors' agendas and interests, a lack of national initiatives to propagate best practices, and of evidence-based policy research and advocacy at various levels and across sectors.

On the positive side, there is a growing understanding of the complex and dynamic relations within farm-forest systems that need to be addressed through deliberative processes. However, the current populist agroforestry approach does not prioritize basic scientific reasoning that can help policy makers to make choices. Although anecdotal case studies and assessments (Kafle, 2012; Amatya, 1994) are available, there is a lack of systematic analysis of the production function of agroforestry across diverse ecological zones of the Middle Hills.

Given resource constraints over the last 20 years, there have been no investments, globally, in basic research on production and productivity of agroforestry (WWI, 2011). In Nepal too, there has been no research on fundamental issues of technological development and innovations.

There is also a significant research gap in the institutional arena with research, training, and extension sectors in agroforestry development working in isolation. The prevailing linear, reductionist, and sectoral approaches to policy development create confusion, contradictions, and conflict across institutional landscapes. Despite there being dozens of policy documents in each of these sectors, for example, APP, these are rarely implemented or properly reviewed to assess the underlying causes of their failure.

Another critical question concerns the conceptualization of agroforestry: as a technical management approach or as a sustainable ecological system of farm and forest interrelationships. If the latter is considered, there is a need for rigorous analysis of all of the social, economic, ecological, and institutional

aspects of agroforestry. There is also a need to understand the dynamic relations of integrated farms and forests for food security and sustainable livelihoods in a changing context. Coordination is required, at the very least between the agriculture and forestry sectors, for effective implementation of agroforestry and to avoid duplication. Therefore, collaboration between key stakeholders from the inception of an intervention is essential to facilitate demonstrations on the ground and to scale up and extend best practices through policy influences.

3.10 Conclusion

This institutional mapping of the fields of agroforestry and community forestry has highlighted key players, their historical emergence, and main areas of involvement. A functional categorization of institutions has outlined the actors' landscapes in terms of their roles in the agroforestry value chain. Four main areas of intervention were identified: policy formulation and regulation; research and policy advocacy; capacity building; and farmers' field demonstrations through technological, social, and institutional innovations.

Institutions associated with agroforestry have evolved over time and are engaged in agroforestry systems at micro, meso, and macro levels with differentiated roles and responsibilities, influences, and contributions. However, the level of engagement of these institutions has varied according to shifts in agroforestry programs and policies over time. There are also imbalances in institutional involvement with minimal engagement of agriculture-related institutions.

The institutional landscape has expanded horizontally across levels during the development and maturity phases. However, this expansion has been project based, and has not, therefore, sustained due to a lack of initiatives regarding institutionalization processes. Therefore, there are gaps in policy uptake, documenting lessons, and coordination among the institutions in national agroforestry initiatives regarding research and innovations, policy formulation, and regular monitoring.

Current approaches to agroforestry are undermining the values of rigorous research on fundamental issues, which must be reinvigorated in agroforestry to ensure livelihoods and food security through technological innovations. There are institutional memories among the currently active institutions/organizations/individuals in agroforestry. However, they need to be captured through balanced representation in future collaborations.



Agricultural systems near Besishar in Lamjung district | by Tony Barlett

CHAPTER FOUR: DRIVERS AND DYNAMICS OF AGRARIAN CHANGE IN NEPAL

Naya Sharma Paudel, Badri Prasad Bastakoti, Rahul Karki, Rajesh Bista. ForestAction, Nepal

4.1 Introduction

This study explores economic and ecological dynamics and key underlying drivers, both endogenous and exogenous, of Nepal's agrarian economy, particularly over the last two decades. In doing it draws attention to the wider socioeconomic and political-cultural contexts of change within which agriculture, forestry, and rural livelihoods operate. This analysis of broader contextual dynamics and drivers of rural landscapes can help us to better understand the prospects and challenges of agroforestry interventions in addressing food security.

Nepal is currently facing two major challenges: an environmental crisis and food security. Environmental degradation has historically received more attention beyond its borders with the popularization of the theory and dominant environmental narrative of Himalayan degradation in the 1960s and 1970s, mainly by Western scientists and writers. This theory and narrative has long dominated Nepal's environmental and developmental agenda, and while its gloomy projection has proved wrong, new alarms continue to sound regarding continuing deforestation, erosion, loss of soil fertility, and urban pollution.

Increasing food scarcity is another serious challenge with Nepal being regarded as one of the most food insecure countries globally. Thirty out of 75 districts are marked as food insecure, and while almost 80% of income is spent on food items, over 40% of children below five years of age are stunted due to malnutrition. There have been several major incidents of famine, particularly in western hill districts.

Hill farming practices are traditionally subsistence-based, integrating agriculture, livestock, forests, and fisheries. The topographical distribution of cultivable land, forests, and settlements, particularly in the hills, favors integrated land use. However, these components—farms, forests, and livestock—have become disconnected and isolated in recent years, thus failing to address the growing food and environmental crisis. A number of endogenous and exogenous factors have also influenced farming and resource management

more generally. A better understanding of these broader dynamics and drivers of rural landscapes would help improve farming and resources, and increase food production.

The overall objective of this study is to understand the dynamics and drivers of transformation in rural landscape of Nepal to provide a contextual understanding of agroforestry and community forestry interventions. The study's specific objectives are: 1) to describe and characterize the major ecological and economic dynamics of agrarian change in rural landscapes; 2) to identify and analyze major drivers contributing to agrarian transformation and the interactions among them; and 3) to draw out implications for agroforestry policy and programmatic interventions in Nepal.

The study is based on a desk review of available secondary data and government reports, a literature review, consultations with experts, and peer reviews. Secondary data mainly consisted of data obtained from Nepal's Central Bureau of Statistics (CBS), the National Living Standard Survey carried out by the Ministries of Agriculture and Forests, the World Bank, and FAO. Other data sources were reports obtained from various development agencies, journal articles, and international reports on rural development and agrarian change.

Regular meetings of the teams carrying out background studies provided an opportunity to conceptualize, substantiate, and refine this chapter. Multilateral and bilateral interactions have fed into its structure and contents.

The chapter is organized as follows. The second section provides an analytical contextual framework on agroforestry and community Forestry (AF and CF) in Nepal. The third section discusses the major dynamics of the rural landscape. The fourth section identifies key endogenous and exogenous drivers that accelerate transformation in the complex rural economy and society. The fifth section briefly outlines the outcomes of these processes and draws implications for AF/CF interventions in Nepal, and the final section offers conclusions.

4.2 The context of agroforestry and community forestry in Nepal

Agroforestry and community forestry operate within specific socio-economic and politico-institutional contexts that provide unique opportunities and challenges. This study considers five important contextual components that underpin AF/CF performance and their ability to address key contemporary challenges in the Nepalese hill context.

4.2.1 Condition of resources and their productivity

The scope of AF/CF is determined by the availability and quality of natural resources, primarily cultivable land, forests, and water sources. Nepal's hills are characterized by steep slopes and limited cultivable land. Further challenges include historically documented environmental degradation, deforestation, and loss of soil fertility. Thus, the condition of resources significantly influences food production, AF/CF sustainability, the cost-benefit ratio, and comparative advantages in relation to other economic sectors.

4.2.2 Access to resources

Ecosystem health and resource availability alone do not account for the status of access to resources. Government policies, legal/regulatory provisions, and institutional frameworks too shape access of communities and households to land and forest resources. This is particularly pertinent given Nepal's hierarchical society differentiated by wealth, status, caste/ethnicity, gender and location. Whereas agricultural land is largely under private ownership, forest land is owned by the government with management rights vested in communities in the case of CF. However, in both cases, access is highly skewed with the exclusion of large sections of marginalized groups. Access to resources and tenure security are critical factors influencing food insecurity, and also who benefits from particular types of AF/CF interventions.

4.2.3 Access to inputs

Production is a function of diverse inputs. While access to land and forest resources is a vital determinant, access to associated inputs such as labor, irrigation, fertilizer, seeds, technology, and pesticides is equally important to realize the production potential of land and forest. Access to inputs is determined by the behavior of either the state and market or both. A plethora of literature, particularly government assessment reports, indicates that lack of access to critical inputs has severely reduced production. Neither the public distribution system nor the market system has been able to deliver timely and quality supplies of inputs and other services.

4.2.4 Household economy

Household needs, their income portfolios, access to information for informed decision making, and rational choices of specific enterprises are important elements that predict the relevance and prospects of AF/CF interventions. The globalization process, monetization and consumerism have all had a major impact on household behavior that needs consideration for any AF/CF intervention.

4.2.5 Politico-institutional structures and their behaviors

Political and institutional structures provide a broad context for the operation of AF/CF by shaping tenure arrangements and access to inputs, facilitating/distorting markets, and building/eroding confidence among the citizens. Equally important are institutional credibility and legitimacy, community institutions, layers of governance and people's trust in them in assessing the prospects of AF/CF.

A political economy perspective to explain rural transformation, focusing largely on structural rural poverty and Maoist conflicts during the last two decades has been the dominant analytical tool (Blaikie et al., 2002; Karki and Seddon, 2002; Upreti, 2004). The differentiated nature of rural society; domination and exclusion around the axes of gender, caste/ethnicity, economic status, and spatial dimensions; and unequal access to productive natural resources, including state controlled resources, are the key elements of analysis in most of these studies. However, there is relative ignorance of some other factors such, as increased accessibility, mobility and connectivity, and government policies.

Considering the above factors, this study seeks to answer several questions related to agriculture and rural development. For example, how important is agriculture for transforming the rural economy and poverty? What is the relative significance of agriculture and the rural non-farm economy in addressing poverty? How are different groups of rural households reacting to the changing crisis and opportunities? How do farmers at different levels benefit from natural resources-based rural interventions? How do changing cropping patterns affect the food security of different groups of households?

4.3 Key features of rural changes

This section identifies and describes key processes of change, including monetization, urbanization, consumerism, de-agrarianization, feminization of the labor force, and land sparring (or sharing). An analysis of these major economic dynamics would help to identify key trends that provide important contextual knowledge for planning future projects. The issues discussed below are closely related and mostly reinforce each other.

4.3.1 Livelihood diversification

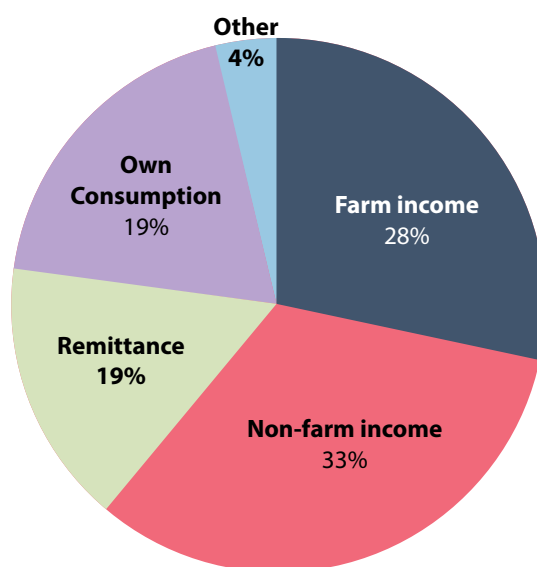
Nepal's high level of rural poverty is mainly due to low returns from agriculture and a lack of opportunities in the rural non-farm economy (RNFE). While the country remains predominantly agricultural with around 78.5% of the workforce (89.6% of women) engaged in agriculture, the sector's contribution to the GDP has been steadily declining and currently stands at 33% (ADB, 2011). Low agricultural productivity, among other factors, has contributed to widespread food insecurity with 30 of the country's 75 districts reported

to be food insecure in absolute terms. Since the RNFE has been historically insignificant, income from short- and long-term migration, mainly to India, has traditionally constituted a core component of rural household economies. In recent years there has been a major labor exodus to more lucrative destinations mainly the Gulf countries, and remittances have dramatically impacted on the country's balance of payments as well as on poverty alleviation. The World Bank, has pegged Nepal's poverty ratio at 33.9% (based on USD 1.25 a day as an international poverty line income), although Nepal's own latest estimate is only 25%. With an average per capita income at \$490 (2011), Nepal ranks as the seventeenth poorest country in the world.

Livelihoods diversification through multiple sources that results from need or evolving local opportunities has always been a key economic feature of rural Nepal. Need-based diversification can be attributed to many factors, especially rural population growth, farm fragmentation, declining farm production, and higher risks in relation to the rewards that agriculture can fetch. In such a situation, dependence on conventional agricultural production alone is not sufficient to ensure a farm household's livelihood sustainability. Landholdings provide the base for agriculture (crops, livestock, and agroforestry) based livelihood outcomes. Thus, land is a crucial means of livelihood. However, over time, farm households having less than 0.5 ha of land have increased from 45.85% in 1996 to 49.2% in 2003, and 55.2% in 2010 (CBS 1996, 2004, 2011a). These rising figures indicate that in the long run, farming alone cannot be a feasible means for deriving sustainable livelihoods. There are equally compelling social reasons for diversifying from agriculture. "Escaping" from agriculture is regarded mainly by youth and partly by their parents as an indicator of development and civilization. Strong peer pressure motives the youth to adopt innovative enterprises usually outside the village and possibly outside the country.

Income sources in rural Nepal are multifaceted in terms of features, trends, and outcomes. These include: i) diversification of income sources and employment within agriculture; ii) the rural non-farm economy; and iii) migration to Terai, urban areas, or outside the country. The first category includes a shift from conventional farming of staple crops to crop intensification, vegetable farming, fish farming, livestock dairy farming, poultry farming and piggeries, high value crops, timber and non-timber forest products (NTFPs), ecotourism, and agricultural wage labor. The second category includes: non-agricultural wage employment and self-employment, and transfers (Davis et al. 2007). Though transfers are normally not considered as income, these play a strong role in diversifying livelihoods. The state's provision of benefits to the elderly and to specific minority ethnic groups such as the Rautes (nomads in the Middle Hills) and the families of martyrs have significantly contributed to livelihood security despite their small volume.

Figure 3 illustrates the diverse income portfolios of a rural household in our study area: the Middle Hills of Nepal. It appears that a typical rural household in this band (across the country) derives around 50% of its livelihood from non-farm income and remittances.



Source: CBS (2011a)

Figure 3. Proportionate allocation of household incomes in hilly areas of Nepal (2011)

Table 3 shows the changing pattern of agriculture-based income and the rising share of non-agricultural wages from 1995/96 to 2010/11.

Table 3. Rural employment by sector (Hills)

Sector	1995/1996	2003/2004	2010/2011
Wage Agriculture	5.9	2.8	1.5
Wage Non-Agriculture	11.1	11.7	13.8
Self-Agriculture	75.3	67.2	62.8
Self-Non-Agriculture	7.7	9.7	10.7
Extended Economy	0	8.6	11.1

Source: CBS (1996, 2004, 2011a)

Migration to the Terai region, Kathmandu, and other cities and towns is a third diversification strategy (described further on) that is equally driven by “pull factor” opportunities. The Terai’s extended fertile flat lands have attracted many hill people, particularly during the second half of the twentieth century.

While diversification of livelihoods in rural areas has been widespread, the returns have been low mainly due to decreased soil fertility, low investment capacity, and small-scale enterprises that do not provide economies of scale. At the same time, rural farmers find on-farm engagement or in the RNFE less competitive due to the flow of cheap consumer goods from neighboring India and China. Wage labor availability is also low and off-farm activities do not supply any substantial income flow. Remittances from migrants working as unskilled low paid labor in India and the Middle East are also insufficient. Moreover, small enterprises such as tea and commodity shops in rural area are not profitable enough to generate sufficient livelihoods. However, people continue these small businesses mainly due to lack of opportunity and costs elsewhere. Despite low returns, diversification continues mainly to reduce risk. As there are high risks with agriculture (e.g. bad weather and pests), diversification to other sectors simply reduces these risks.

Opportunities for livelihood diversification are not evenly distributed. While those with better incomes have diverse options for complementing their farm incomes, the poor have little access to these for several reasons. These include lack of resources to invest in any off-farm activity, poor educational levels constraining them to seek non-agricultural employment, and weak access to many networks and information sources that can be instrumental in providing support for business or employment. In case of remittance, members of the poor households cannot invest in various activities along the value chain. They only have access to low paid labor work in Nepalese towns or Indian cities. Only those who are better off can invest in starting up manpower companies and gaining specific skills (e.g. as cooks and drivers) that enable them to earn better incomes.

Moreover, not all diversification initiatives are helpful in addressing food scarcity and poverty. Some examples are: the shift to cash crops has made farmers more vulnerable to price fluctuations of the international market;³ unsustainable harvesting of NTFPs has led to environmental destruction; and remittance and cash transfers have increased dependency on outside sources, and in some cases have lessened the motivation to work.

³ Price fluctuation of cardamom and ginger

4.3.2 Commercialization

The trend toward commercialization of some agricultural and livestock products and NTFPs has been increasing, mainly in areas where market-inducing structures are in place. Rural producers mainly supply primary raw materials (agricultural and livestock produce and NTFPs) without adding value, while urban traders supply value added manufactured goods to rural areas, thereby fetching higher prices compared with rural producers. This phenomenon raises the question of whether farming is benefiting from engagement in trade or commercialization, and if so, how and at what cost? Declining terms of trade can also have some relevance for measuring transactions between rural and urban contexts.

Very recently, commercialization has been evident in certain geographical areas and sectors, though at a slow pace. In areas surrounding big cities, and along the corridors of national highways, people have begun to engage in specialized market-oriented production. Farmers in three districts in the Kathmandu Valley, and in Kavre, Nuwakot and Dhading, have begun vegetable farming and raising dairy cattle and buffaloes. Similarly, commercial poultry has rapidly increased in Chitwan and other big towns, and along the Prithvi highway. Producers' organizations, particularly commodity-based cooperatives, small collectors, and dairy companies are involved in the commercialization of vegetables, dairy products, and high value crops (cardamom, ginger, NTFPs, and herbs). The growth of these activities is partly due to the government's policy provisions, for example, a more liberal economic policy adopted after 1990 and the Agricultural Perspective Plan (APP) that began in 1995 and aims to transform subsistence farming into commercial agriculture. Moreover, expanding infrastructure and market forces, and increased demand for cash in rural areas, have jointly accelerated commercialization.

4.3.3 Urbanization

The proportion of the urban population (now 20%) has doubled over the last thirty years. Numbers of municipalities and their populations have shown a phenomenal increase (Table 4) and commercial activities around cities are growing rapidly. The burgeoning population, mainly migrants from rural areas in search of better livelihood options and amenities such as education and health, has put a lot of pressure on existing cities. Urbanization is occurring mainly around the big cities or along the highways. In addition, smaller towns/business centres are emerging with the extension of rural roads.

Table 4. The changing rural-urban population ratio

Rural-Urban Population Ratio (in %) in Nepal			
Year	Rural	Urban	% Ratio
1954	97.1	2.9	33
1961	96.4	3.6	27
1971	96	4	24
1981	93.6	6.4	15
1991	90.8	9.2	10
2001	85.8	14.2	6
2011	83	17	5

Source: CBS (2011b)

Growing urbanization places growing pressure on the rural economy in different ways. As the country's manufacturing sector is weak, urban centers convey imported consumable to rural areas, which results in cash being drawn out of rural areas. Moreover, rural populations are increasingly relying on privatized health and education services from urban centers, increasing their financial burden. In general, the growth of urban centers is expected to create a market for rural produce. However, in most cases, farm produce either from the Terai or imported goods have dominated the market. Apart from a few pockets of vegetables, poultry and dairy farming, most rural farmers have mainly benefited from urban markets. Seasonal glut, mainly due to the production of a single commodity, makes rural farm produce less competitive during market transactions.

Nepal's urbanization pattern is specific with people migrating to urban centers but mostly not entirely abandoning their homes and farms. In many cases, some family members, particularly those in schools/universities stay in the cities while maintaining their farmland for subsistence.

4.3.4 Monetization

The rapid monetization of Nepal's rural economy is replacing the barter system that still exists in many parts mainly for exchange of labor, goods and other services. Monetization is an outcome of a dynamic context entailing growing commercialization of goods and services within farming as well as households, and is supported by expanding banking services, remittances, lack of labor, and flooding the market with consumer items. People are increasingly relying on banks and financial institutions for deposits, borrowing, buying agricultural inputs, and paying wage labor. However, monetization becomes a matter of concern in areas where there are few if any activities to compensate or replenish outflows of cash resulting from increasing consumerism.

The attachment of greater value to cash for its liquidity is the preferred transactional means for agricultural labor and the purchase of other inputs (seed and implements). For families with little or no disposable income for hiring or purchasing inputs, this has meant abandoning some farming activities.

4.3.5 Deagrarianization

Despite being incapable of supporting adequate subsistence of farm families, agriculture continues to be a major occupation in rural Nepal. Agriculture is heavily inclined toward production of food grains, paddy being pervasive. However, food self-sufficiency is not ensured with abysmally poor performance records and virtually stagnant growth rates (2.7–2.8%) recorded for this sector during the past two decades (Karkee 2008). This is widely attributed to low availability and accessibility of agricultural inputs, decreasing soil fertility, and environmental causes including natural calamities, resulting in limited incentives to invest and a decrease in the agricultural population from 90% in the 1980s to 76% at present. There is a prevailing public perception that abandoning agriculture is “the best way to escape poverty,” while meager public expenditure (around 3% of the total budget) indicates the government's low prioritization of agriculture. The growing economic value of land, especially from land plotting and speculation has made agriculture less productive compared with real estate. There is also a growing tendency of leaving land fallow in the Middle Hills as there is little incentive to cultivate it against the higher labor wages/shortages that has led to shortfalls in agricultural production.

The changing aspirations of Nepal's younger rural generation of rural Nepal, who are veering away from agriculture as a major occupation, has been less studied and understood. For a majority of the youth, escaping from agriculture is the single most powerful indicator of progress. Those who stick to agriculture are often identified as unfortunate and less industrious. The few youth who are engaged in agriculture have a more entrepreneurial and innovation orientation. Thus, agriculture is sidelined largely because of increasing peer pressure to leave farming as well as to get acquainted with the outside world.

Feminization is another strongly evident and important dynamic in rural areas due mainly to large-scale male migration, after the mid-1990s. During this period, Nepal's economically active population significantly increased within the predominant age group. Not only women, but also the elderly became the main agricultural labor force in most if not all households and communities, playing key roles in local farming and livelihoods systems. Yet, they continue to have limited control over necessary resources and poor access to complementary inputs and services such as technology, farm extension, training, and credit. In such circumstances, women have to make farming decisions and may be largely constrained to make investments and strategic decisions due to their lack of access to and control over major strategic assets. The vicious circle created by such circumstances can lower agricultural production and gradually disconnect the entire society from agriculture.

4.3.6 Migration

For over 200 years, migration from Nepal's rural hill areas has been prevalent, historical destinations being the North Eastern Indian states, Burma, and the Indian and British armies. Since the 1950s, three major destinations for hill people have been the Terai, major urban centers (Kathmandu and Pokhara), and abroad (e.g. India, Gulf countries and Malaysia). Members of small farming families (with more than 1 ha) mostly avail of migration opportunities as they can make the initial investment, including temporary living and travel costs, and have better access to information and social networks. While migration to the Terai reached a peak during the 1980s, migration to the cities climaxed during the armed conflict period (1996–2006). Table 5 shows the volume of migration (absentees) from different ecological zones. 14.62% of absentees are from urban areas and 42.3% from rural areas (CBS, 2011a).

Table 5. Number of absentee people

Region	Population	% (of total absentees)
Mountain	107,936	5.60
Hills	998,087	52
Terai	899,880	42.30

Source: CBS (2011a)

Migration of different types has different impacts on the hills. Migration to the Terai has helped to keep the population in the hills balanced, while seasonal or short-term migrants to India or the Gulf countries bring remittances. Two aspects are important here. First, migration-induced labor shortage has increased fallow land, particularly the marginal land among better off households. As there is absentee landlordism, these lands do not require labor and other investments. Second, labor scarcity has reduced on farm management interventions and CF so that the production potential of CF and other marginal lands has not been fully realized.

4.3.7 Consumerism

Generally speaking, consumption is important for stimulating the economy and is a good indicator of household welfare. While the largest part of household (HH) revenue goes for food, the demand for imported commodities and urban industrial services has increased in recent years. Increasing awareness of nutritional needs, TV advertisements, increased all season supplies of fruits and vegetables, and increased purchasing power of certain social groups have contributed to growing consumerism. All of these have resulted in increased demands for cash, which are largely met through remittances, sale of agricultural products, and wage labor.

4.3.8 Institutional dynamics

Natural resource management (NRM) in Nepal has gradually shifted from contextual and holistic management that values multiple outcomes to the domain of formal, usually state-owned techno-bureaucratic institutions that are conceptually and structurally founded on departmentalized and compartmentalized modern disciplinary divisions. Consequently, the very institutions developed to enhance the environmental, economic, and social benefits of natural resources pose challenges for achieving those benefits due to their territorial and narrowly vested interests.

Local community level institutions are increasingly relying on these distant government agencies for regulatory services, accessing inputs, technology, and finance for managing land and forest resources. Thus, NRM practices are usually shaped by conflicts and collaboration between two different knowledge bases, worldviews, and perspectives.

Increasing the productivity of agriculture, animal husbandry, and allied land use systems requires increased financing. Existing local and personal investments that are usually based on personal savings or borrowing are limited. Consequently, new formal institutions have been developed for this purpose and cooperatives and banks too are involved in this field. Their governance and relations to the rural economy have created new opportunities and challenges for financing the agriculture-based economy.

As the agricultural economy is moving from subsistence to commercialization, local transactions based on barter, goods-labor exchanges, and buying and selling at local hat bazaars (local rural markets) are increasingly being replaced by specialized market channels involving large scale transactions with long value chains at national and international levels. Apart from economies of scale and technological innovations, this demands meeting various regulatory requirements at different levels.

Finally, the specific context of the rural NRM-based economy includes farmers' associations, citizen networks and federations, local institutions, political parties, and trade unions. Conflicts and collaborations between these institutions, and their changing mandates and interests resulting from such activities have shaped and transformed the rural landscape.

What then does this mean for the promotion of AG/CF in Nepal? Three points are important here. First, any AG/CF interventions must be informed by and engage with institutions at different levels from the local to national and beyond. Second, specific interactions and negotiations between institutions may have evolved from indigenous and external practices. Third, existing disciplinary boundaries between institutions must be examined and their collaboration and potential merging should be explored.

4.4 Drivers of rural transformation

This section identifies major drivers of rural transformation (or stagnation), highlighting their characteristics and direct effects. These include poverty and low returns, remittances, infrastructure, government policies and incentive structures, and market forces. Though the distinction between drivers and dynamics is difficult to maintain, we retain this distinction to depict a logical sequence.

4.4.1 Low returns from agriculture and RNFE

Low economic returns from farming and non-farming activities have been the 'push' factor for livelihoods diversification and adoption of various RNFE activities. A huge gap exists between potential and actual productivity of many agricultural and allied products (Table 6). Low inputs (labor, irrigation, fertilizers, and pesticides) and poor technology (less productive seed varieties and tools/implements) impact on productivity. Low investments due to lack of financing facilities, high risks, tenure insecurity, or market-related disincentives (cheap products from India) are also secondary factors, while government policies (e.g. subsidized food) that create incentives or disincentives are equally important.

Table 6. Productivity gaps for selected agricultural commodities

Product	Units	Current Production	Potential Production
Fish	t/ha/year	3.6	(6)10
Timber	m ³ /year	0.337	13.4
Paddy	t/ha/year	2.72	(5) 10-12
Vegetables	Mt/ha/year	12.8	(17)
Buffalo Milk	Litres/Lactation	900	2000

Sources: DOFD(2010)⁴; MFSC(1988)⁵; MOAC(2010)⁶ and Dir. Crop Dev & Dir. Veg. Dev. and DLS (2010).⁷

4 DOFD, 2010. *Annual progress report*, MOAC, DOA, Directorate of Fisheries Development, Balaju, 90pp.

5 MFSC, 1988. *Master Plan for Forestry Sector, Main Report*, Ministry of Forest and Soil Conservation, Nepal.

6 MOAC, 2010. *Statistical Information on Nepalese Agriculture*.

7 DLS, 2010. *Annual Technical Report/ Animal Production Directorate*.

4.4.2 Demographic changes

Nepal has experienced persistently high population growth, resulting in increased demands for food, drinking water, housing, consumables, and essential services such as health and education. The growing population and its changing consumption behaviour has increased pressure on land and other natural resources whose productivity must be increased to address the growing demand. Access to land, forests, and water resources is also significantly unequal so that those with poor access must find ways of making a living outside the farm and usually outside the rural area.

Table 7. Population growth since the 1950s

Year	1954	1961	1971	1981	1991	2001	2011
Population (million)	8.3	9.4	11.6	15	18.5	23.2	26.6

Source: MOPE (2004)

The high population growth rate (1.59% in 2011) has also changed the population structure over the last two decades with rapid growth of the working age group (15–59 years) from 52.8% in 2003/4 to 54.2% in 2010/11, followed by the elderly group (> 60 years). These changes indicate labor availability that can be an asset for agricultural or industrial growth. However, a large work force also suggests the use of labor intensive and labor substituting technology. In this case, agroforestry may have certain benefits as it can be labor-intensive and not technology intensive. The changing demographic composition has a wide range of impacts on ecosystems and society with Nepal's enduring poverty and environmental crisis being linked to the growing population, primitive agricultural practices, and high resource dependence.

4.4.3 Decreasing access to land

Decreasing access to natural resources is another important driver of migration, livelihoods diversification, and adoption of non-agricultural economic activities. Access to resources has decreased due to land and property division within families, environmental degradation, and promotion of diverse protective resources management regimes such as protected areas. While private farmland is the prime production resource, the average landholding size is gradually decreasing (see Table 8). Decreasing access to natural resources either due to shrinking availability or protective management regimes compel people to adopt alternative livelihoods option usually within non-agricultural sectors.

Table 8. Change in land holding size

Year	1996	2003	2010
Average Agricultural Land (Ha/capita holding)	0.89	0.7	0.6

Source: CBS (1996, 2004, 2011a)

From the perspective of strategic agricultural development, farmers can be divided into three categories: i) small commercial farmers; (ii) subsistence farmers; and (iii) landless or near landless.

Small commercial farmers can be defined as those with holdings of 1.0 to 5.0 ha. They constitute about 25% of rural households (84,300) and command 61% of farm land, selling over 30% their farm output and ready to invest in intensive farming and take risks. They could be the engine of agricultural growth, driving rural non-farm employment, food supplies, and national income.

Subsistence farmers are those with holdings between 0.5 and 1.0 ha. They comprise 27% of rural families and own 24% of the land. They are subsistence producers with inadequate land to survive purely as subsistence farmers, therefore requiring substantial non-farm employment to survive. They are more risk averse and are short on capital, usually seeking loans but seen by lenders as risky. They invest considerable time in non-farm employment, which reduces the quality of their husbandry.

The landless and near landless have holdings of less than 0.5 ha (half of them are landless) and comprise half of the rural population (1.6 million families). They command only 15% land. Focusing solely on agriculture and other land-based activities can hardly contribute to poverty reduction of this group. It is usually argued that they can benefit either through the economic growth of small business farmers or through generation of employment in the non-agricultural sector.

4.4.4 Remittances

Currently, remittances contribute over 20% of the national GDP and over 30.9% of household incomes (CBS, 2011a), engaging about 22.17 % of Nepal's active population (MoLE, 2012). The significance of remittances in the national economy is evidenced by the steady increase in their volume since 2001—from US\$ 618 million in 2002 to US\$ 3,782 million in 2011—a six fold increase in a decade. The contribution of remittances to the Gross National Product (GNP) has increased by more than 5% of the GNP in the past five years from 11.5% in 2000/01 to 16.8% in 2005/06 (Bhadra, 2007). Consequently, foreign exchange earnings increased from 36.6% in 2004/05 to 46.7% in 2005/06, thereby strengthening the balance of payments (ibid).

Since 1990 when Nepalese began to migrate overseas in search of work, the number of households receiving remittances has continued to grow. Though working in India is a historical practice, migration to the Middle East and Malaysia is a relatively a new phenomenon. During this period, the number of households receiving remittances, the volume of remittance money entering households, and the relative share of remittances in the household economy all increased. The total percentage age of remittance-receiving households rose between 1995 and 2011 from 23.4 to 55.8. There was a significant rise in the amount of remittance per recipient household during this period from NPR 15,160 in 1995/96 to NPR 80,436 in 2010/11. Overall, the share of remittances in recipient household incomes increased from 26.6% to 30.9% during this period. In some cases, the remittance amounted to NPR 128,000 (US\$ 1,800), which comprised more than three-quarters of the total household income.

Impacts: Remittances are clearly one of the key drivers of contemporary Nepali agrarian society, which has had knock-on effects in diverse areas. First, it has helped increase foreign reserves, strengthening the capacity to import goods and services. By strengthening the national treasury and increasing the current account and transactions, confidence in Nepal's economy has increased internationally. Second, at the micro-level, household remittances have contributed to an increased cash flow, disposable income, consumption, and to a lesser extent, investment capacity of households. Third, though on a very small scale, remittances have contributed to investment primarily in asset accumulation that is productive or adds to household welfare (e.g. land, houses, livestock, and utensils). Fourth, remittances have helped to increase people's mobility and connectivity through increased access to means of communication (mobile phones), internet, and print media. Importantly, by penetrating households, they have made a significant contribution to household economies, contributing to higher per capita incomes over the last 14 years. Moreover, they have helped to maintain macroeconomic stability and contributed to growth even during the conflict period in Nepal (NPC, 2011).

A recent survey by the World Bank showed that remittances have resulted in an increase in household incomes by 5.4 times, contributing two-thirds of the income of remittance-receiving households. About 40% of surveyed households depended entirely on remittances. However, the majority of the share from remittances is spent on daily consumption, which comes to be around 82%. This is followed by, repayment of loans (7%), acquiring household property (5%), education (4%), and capital formation accounts (2%). Apart from high inflation and investment in the non-productive sector, the huge inflow of remittance money has weakened the manufacturing sector because of the comfort blanket it provides.

Remittances have produced new dynamics in the family structure, social relations, and cultural preferences. The increased cash flow at the household level has increased consumerism and demands for manufactured goods, including food, clothing, utensils, furniture, and luxury items. Socially, families are divided with children usually put in hostels in nearby towns. In many cases, mothers move with their children to look after them, leaving only parents, who are usually elderly, at home. Tensions also arise between husbands working abroad and wives left at home. Moreover, hundreds of migrants have died while outside and their families have faced difficulties bringing their bodies back.

The highly volatile and precarious nature of remittance with its strong ebb and flow and associated shocks, has disrupted the families not only economically but also socially and culturally. Remittance has also gradually eroded the work ethos. A recent World Bank study indicated that while males in non-migrant households spent 38 hours per week on income-generating work, those with migrants abroad spent 32 hours a week on such work. There was, however, little impact on females.

4.4.5 Infrastructure

There has been a steady growth in infrastructure over the last 20 years mainly in roads, telecommunication, electricity, irrigation, drinking water, markets, banking, and the agricultural and health service centers. This has facilitated accessibility, mobility, and connectivity in rural areas.

The road network has significantly increased during this period from 8,382 km in 1991 to 20,263 km in 2010. As a result accessibility in rural areas has substantially increased, leading to decreased time to reach cooperatives, agricultural centers, commercial banks, and market centers. Whereas in 2003, only 27% of population was within a 30 minute travel distance from the road and approximately 34% had to travel for over three hours to get to the nearest cooperative, in 2010, 54% were within a 30 minute distance of a road and only 12% had to travel this amount to reach a cooperative. The situation is similar in relation to commercial banks, government service centers, and market centers. Additionally, the rapid expansion of telephone and mobile networks, FM radio stations, fast growing circulation of newspapers, and internet services have connected rural communities to the outside world. They benefit by being able to avail of information about markets, remittance destinations, health and education services, agricultural inputs etc. In many cases, increased connectivity has also helped to reduce outmigration from rural areas.

Increased irrigation facilities have enabled crop intensification of rice, wheat, and fresh vegetables, particularly off season. Similarly, electricity availability has helped to establish small agro-based enterprises such as dairies. The growth in infrastructure has had a very strong knock on effect on the rural economy by reducing transaction costs, improving supply chains, and providing incentives for rural production systems.

Insurance to support high yielding crops and livestock has become a crucial issue. Currently, this covers less than 0.3% of livestock enterprises. The existing legal framework is weak, vague, and with poor monitoring and compliance. Insurance companies lack needed capital, experiential insights, and international experience. Because of their small scale, insurance schemes have faced high transaction costs. Also, there is low demand from farmers as they cannot pay the premium.

The Government has used subsidies as a strategy to ensure timely availability of fertilizer, technology, seeds, irrigation, and transportation to remote areas. However, these policies have not been able to deliver on their objectives to benefit farmers and the agriculture sector in general. Local governments are too dependent on the central government for funds. Moreover, Village Development Committees (VDCs) generate only 16% of their expenditure while District Development Committees (DDCs) generate around 20% of their expenditure. This indicates their weak capacity to mobilize their own resources in support of agriculture. Though agriculture is largely free of tax liabilities (no tax on agro-income, no VAT, and no excise duty), it has not taken adequate advantage of these policy supports.

4.4.6 Markets

Since 1990, liberalized economic policies have been in place promoting the market as the engine of growth and structural transformation. The growing market for agricultural and forestry products provides

households with an opportunity to specialize given a comparative advantage and welfare gains from trade. The domestic market for agro-products has grown as has international demand for high value crops and NTFPs. The market has been flooded with manufactured commodities, including agricultural products, herbal products, and furniture. The expanding market has induced commercialization, specialization, and agricultural intensification, mainly in areas such as milk, vegetables, poultry, timber, and NTFPs. However, not all farmers, particularly the poor and marginalized, have been able to benefit from expanding market opportunities.

4.4.7 Environmental security

Environmental security refers to a household's capacity to meet its needs for environmental resources for production and consumption activities. Heavy reliance on environmental resources features centrally in 74% of rural livelihoods that rely on firewood for cooking and heating (Baland et al. 2004). Environmental insecurity increases the uncertainty of household income, which may lead to the decision to migrate as an insurance strategy if these uncertainties cannot be corrected locally. Many hill people migrated to the Terai mainly to escape from various forms of insecurity caused by natural hazards or a scarcity of critical environmental resources.

Environmental degradation, notably deforestation, loss of soil fertility, water scarcity, and shrinkage of land, forest and water resources has major impacts on rural livelihoods. Deforestation and the resulting limited access to forest resources have directly hit livestock, particularly cattle, buffaloes and goats/sheep. In fact, there has been a sharp decrease in the average number of livestock per household. Inability to raise livestock has a chain effect from loss of soil fertility to loss of production. Low livestock levels directly undermine the supply of protein, thereby reducing nutritional standards.

Drinking water scarcity has become a critical issue with hundreds of rural communities deprived of clean drinking water. Fetching water is notoriously laborious and takes several hours, and lack of water for irrigation has reduced agricultural productivity. Moreover, depleting forest resources, particularly fodder, fuelwood, construction materials, and water, not only provide a disincentive for agriculture, but also in many cases induce migration which is one of the key coping strategies for rural households.

Natural disasters such as epidemics, landslides, floods, fire, and earthquakes either physically displace hundreds of households annually or reduce farm production and productivity. Around 2.8 million people in Nepal have already been affected in various ways by natural disasters in the past 20 years, and 21,438 people have consequently lost their lives. As the local environment cannot subsequently support livelihoods, people look for alternative opportunities, often outside the farm.

Climate change, particularly climatic variability and increased natural disasters have brought new challenges to the rural economy, and especially to agriculture. Too much or too little water, extreme heat and cold, increased incidences of pests, and decreased flowering capacity, may add new challenges to agriculture. Climate change thus requires a shift toward "climate smart" agriculture. This means that agriculture must be climate resilient in the short run and adopt a low emission path in the long run. The emerging carbon market may provide incentives to grow more trees/perennial crops in farmland.

4.4.8 Maoist conflict

On February 13, 1996, the Maoists formally waged war on the Nepalese state, starting from Rolpa (in the western hills) and gradually spreading to the neighboring districts of Rukum, Pyuthan, Jajarkot, and Salyan. When the first round of peace talks failed, they launched a major attack in Dunai, the district headquarters of Rolpa on Sept 25, 2005 (Hutt, 2004). The conflict subsequently ascended to a climax until the political parties reached a 12-point deal and fought for a democratic state that brought a major change in 2006. During this period, a total of 13,347 people were killed (INSEC, 2008). With the escalation of the conflict across the country, especially after the imposition of a state of emergency in November 2001, the number of internally displaced people increased dramatically from anywhere between 100,000 to 500,000 (Shrestha and Niroula, 2005). The impact of the Maoist conflict has been significant both in terms of food production

and distribution. Young people either migrated or joined the Maoist force. This resulted in removal of some of the most able-bodied household members from farming (Seddon and Adhikari, 2003). While people were already suffering from poverty and destitution, the conflict also brought physical insecurity that forced people to migrate to nearby hilly towns, Kathmandu, or to India (Edwards, 2008; Bohra and Douglas, 2011). In their study of Chitwan, Bohra and Douglas (2011) observed that violent conflict is the most influential factor pushing international migration. Besides those people displaced due to armed conflict, there are a range of other internally displaced people in Nepal who belong to disadvantaged groups in society and have struggled to meet their basic needs (Tamang, 2009). Because most displaced persons came from farming communities, they are unprepared to make a living in urban areas and often work in low-paid and exploitative conditions (Tamang 2009).

4.5 Major outcomes and implications for AF/CF

4.5.1 Food insecurity among the poor

The above discussion indicates evident food scarcity that results in severe food insecurity, especially for the poor. Though the purchasing capacity of a small section of society has increased, the situation for the majority of the poor has deteriorated. Food insecurity among the poor can be attributed to limited access to productive land, lack of rural non-farm employment, low wages, and little access to the remittance economy.

4.5.2 Low returns and high cost of agriculture

While agricultural productivity has been gradually decreasing, the cost of inputs has been going up. Farmers spend an increasingly larger share of their farm income on inputs whose availability, accessibility, and quality have become a serious concern leading to critical impacts on production. Consequently, agriculture has increasingly become less rewarding, which explains the deagrarianization of the rural landscape.

4.5.3 Fallow land and absentee ownership

Large areas of marginal lands in rural areas have not received adequate inputs. There is a severe labor scarcity in rural areas mainly due to migration. Besides, limited incentive to work resulting from easy flow of remittance, weak tenure arrangements have resulted in low labor inputs on land and forest. Absentee landlordism has also resulted in decreased investment in land. Consequently, a large part of the land that could have been managed for productive purpose is left fallow. The productivity of these lands can be substantially increased through new policy interventions tailored with market incentives for agroforestry products. An incentive structure can be created by putting certain conditions on land use practice, changing land tenure regimes, and facilitating markets in certain ways.

4.5.4 Growing demand for agroforestry products

The market for non-staple agroforestry products has substantially increased. A growing international market and increased purchasing power among a minority of urbanites in Nepal has induced demands for agroforestry products (fruits, nuts, spices, and other high value products), presenting good prospects for AF/CF promotion.

4.5.5 Marginal lands and community forests can improve food security among the poor

The figure below summarizes the preceding discussion. Population growth, decreasing access to land, environmental degradation, and a neglected rural economy have resulted in low productivity of land-based activities. Simultaneously, the expanding infrastructure and market have brought new dynamics into the rural economy, increasing the demand for cash. Farmers are adopting agriculture intensification and commercialization to earn cash. However, migration has become the key strategy to meet the increased demand for cash.

However, only a few periurban areas and highway corridors have adopted agricultural intensification and commercialization, and even in these areas, not all farmers can afford to adopt this practice. High costs, non-availability, and lack of quality are some of the important issues. Poor farmers have been gradually excluded from farming due to high costs. As a result, many have opted to migrate. However, remittance has disincentivized farmers from cultivating marginal lands which are increasingly being left fallow, increasing food scarcity. However, this also presents an opportunity to introduce AF/CF in large areas of marginal lands (private, public or community) into productive management regimes which can also provide employment opportunities for the poor, thereby addressing their food insecurity.

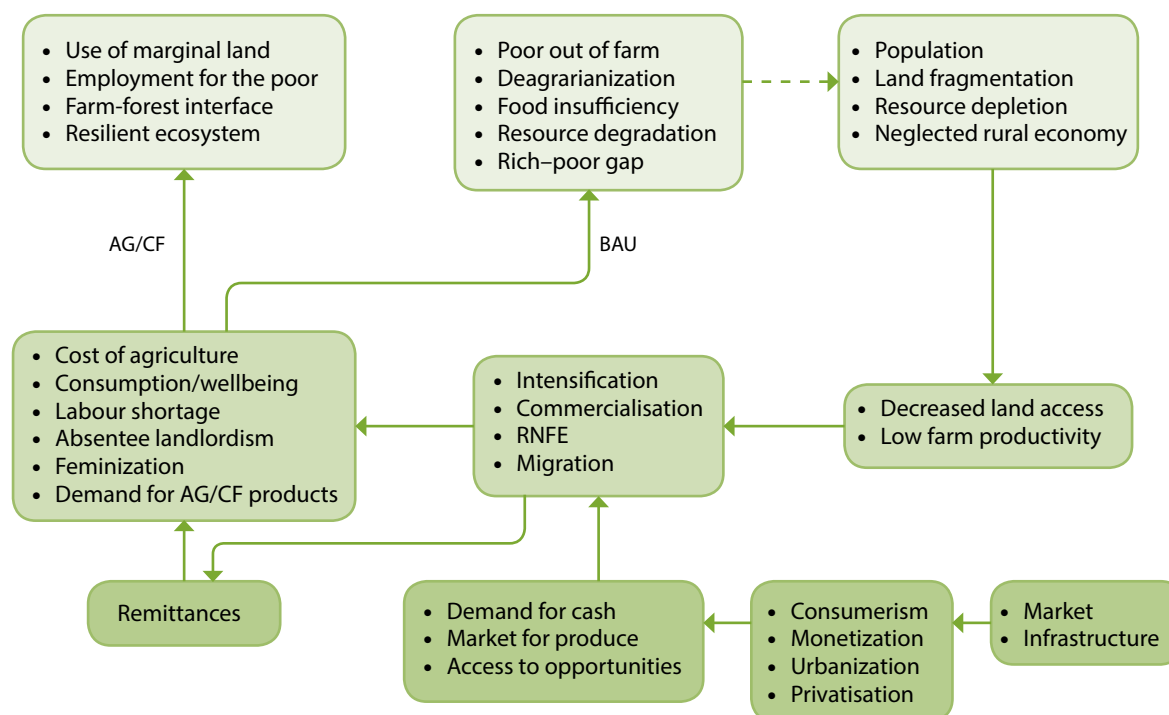


Figure 4. Key features of a transforming rural landscape

4.6 Conclusion

Nepal's rapidly changing rural landscape, encompassing an agrarian economy, fragile ecology, and complex and differentiated society is creating new opportunities and challenges. The rural economy is predominantly based on low productive subsistence agriculture with limited rural non-farm economic opportunities due to limited and unequal access to productive natural resources and other assets. At the same time, rural society is in a complex process of transition entailing migration, urbanization, commercialization and monetization of the local economy. Moreover, significant institutional shifts from traditional, informal local institutions to modern, formal and bureaucratic institutions often bring state and market actors into the realm of complex multilevel governance.

A number of endogenous and exogenous factors are at play in inducing and accelerating these changes. Among the endogenous ones are: population growth and associated demographic changes, land fragmentation and decreasing access to productive land, and a growing environmental crisis, particularly loss of soil fertility and frequent natural disasters. These drivers have contributed to reducing productivity and total agricultural production, forestry, and natural resource management activities, and have increased risk and vulnerability. Consequently, people are forced to diversify their income portfolios, moving toward the RNFE and migration.

Among the external drivers, remittance has been the most influential, contributing the largest direct income outside of agriculture at the household level. More than any other economic sector, the distribution of remittances is spread across the country especially among subsistence farmers and small commercial farmers both in rural and urban areas. Remittances directly reach the household and individual levels without undergoing any bureaucratic and administrative process. There is no conditionality on spending and household decisions are not, therefore, constrained by any regulatory and bureaucratic processes. However, remittances have little impact on capital formation as they are mainly spent on food, consumables, health, and education.

Other important drivers include physical and institutional infrastructure that facilitate accessibility, mobility and connectivity among people. Along with expanding road and communication markets for consumer items, production inputs and agricultural produce have now penetrated rural and remote places linking them to administrative centers and national/international markets, and increased access to information and technology that help in developing new knowledge. All of these have collectively contributed new dynamics that may either lead to a vibrant and productive rural economy or may even destabilize the society.

These drivers and the resulting rural transformation indicate mixed and sometimes conflicting prospects of AF/CF in Nepal. On one hand, because people find agriculture less rewarding, they are diversifying their livelihoods outside of agriculture. On the other hand, fallow marginal land and an underemployed labor force in rural areas provide opportunities for AF/CF intervention. Lack of viable alternative opportunities outside of agriculture indicate that investing in agriculture is the preferred government policy option for rural development. How to transform the current low benefiting agriculture to one that provides adequate benefits against inputs is a question for further enquiry.

CHAPTER FIVE: THE CONTRIBUTION OF AGROFORESTRY AND COMMUNITY FORESTRY TO FOOD SECURITY AND LIVELIHOODS IN NEPAL'S MIDDLE HILLS: A STATE OF KNOWLEDGE REVIEW

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5.1 Introduction

In rural Nepal where there is heavy dependence on forests for basic household needs such as fodder, fuelwood, timber, and NTFPs, community forestry (CF) and agroforestry (AF) play vital roles in people's daily lives. However, despite increasing attention to the role of CF and AF in meeting people's livelihoods and food security, currently available knowledge for assessing their specific roles remains limited. While some experts state that forest resources can help improve the livelihoods of the poor (Pandit et al., 2009), others argue that forests have limited potential to contribute to food security and livelihoods (Angelsen and Wunder, 2003). These contrasting viewpoints indicate a critical need for further investigation.

This study aims to examine the extent to which AF and CF have achieved their expected goals in contributing to livelihood requirements and food security. This can provide valuable insights in designing future livelihood enhancement and poverty reduction programs and projects. The study's objectives are two-fold: 1) to assess the contribution of CF and AF to poverty reduction and livelihoods of rural populations; and 2) to identify gaps and suggest recommendations for improving their contributions to food security and livelihoods in the Middle Hills of Nepal.



Trees are under-utilised in Kavre, Nepal | by Aulia Perdana

Researchers and development practitioners in the forestry and rural development sectors have flagged key issues that challenge pro-poor economic development and can be resolved to produce desirable outcomes through inclusive development and equity and good governance coupled with environmentally oriented activities. These include elite domination, social exclusion, gender inequality, environmental degradation, and lack of alliances and networks related to natural resource management (CIFOR, 2007; Pandit et al., 2008). Past studies suggest that reorientation of the economy, society, and the role of governance is essential for fostering equity and reducing poverty (Human Development Report, 2005). Thus, the contribution of AF and CF to food security and livelihood enhancement can be measured through the integration of multidimensional spheres of development, including the various forms of capital—human, natural, economic, political, social, and physical. This study adopts measurement indicators for each variety of capital, presented in Table 9, to assess the performance of AF and CF in terms of livelihood enhancement and environmental sustainability.

Table 9. Measurement indicators

Poverty Spheres	Well-being indicators
1. Human capital	<ul style="list-style-type: none"> – Leadership capacity improved – Literacy rate increased – Children nutritional status improved
2. Physical assets	<ul style="list-style-type: none"> – Change in household assets (houses, bicycle, radio, toilet) – Access to market and infrastructure services increased (transport, roads, community buildings, drinking water, communication facilities) – Access to information services increased
3. Natural capital	<ul style="list-style-type: none"> – Number of fruit, fire wood, timber and NTFPs in farm and community forests increased – Amount collected of fodder, grasses and NTFPs from AF and CF increased – Area under different forest types and crown cover percentage increased – Balance achieved between forest resources and population growth/migration
4. Financial Assets	<ul style="list-style-type: none"> – Household's farm and off-farm income increased – Household cash saving increased – Youth employment enhanced
5. Social Capital	<ul style="list-style-type: none"> – Resources use rights and access to resources for women and poor increased – Women's and children's workload decreased – Participation of women and deprived members in decision making increased – Capacity of women groups to organize and participate equitably in various social and economic activities, including training, increased
6. Food security (production, income, and consumption)	<ul style="list-style-type: none"> – Number of food shortage months decreased – Ability to buy food increased – Change in farming technology and practices

Research methods adopted for the study entailed collection of both primary and secondary data. Secondary sources included literature and reviews and individual studies, including reports and records of various organizations such as NAF, ForestAction, Environmental Resource Institute (ERI) Nepal, Livelihoods and Forestry Programme Nepal (LFP), Nepal Swiss Community Forestry Project (NSCFP), New ERA, ICIMOD, Kathmandu Forestry College (KAFCOL), and WWF Nepal.

Case studies conducted by NAF and KAFCOL constituted major primary data sources and were complemented by PAR studies of community-based forest and tree management in the Himalayas conducted by the Institute of Forestry (IOF) Pokhara and the University of Life Science Copenhagen, and by the Adaptive Collaborative Method (ACM) developed by CIFOR, New ERA, and ForestAction. NAF conducted a case study of the contribution of AF in Rasuwa and Dhading districts. Data was collected from a sample of 120 farm households in Dhaibung Village Development Committee (VDC)⁸ within Rasuwa District. The households were randomly sampled within two wards (60 households each) that were purposively selected as representative of the typical Middle Hill situation of agroforestry promotion in private land. The data were cross-validated through interviews with farmers in both districts.

KAFCOL conducted a case study on the contribution of CF in Dang, Pyuthan, and Mustang districts through group discussions, key informant surveys, and household surveys. Group discussions were held with three forest user groups, one in each district, selected according to parameters such as inclusion of *dalit* and indigenous households and representativeness in terms of resource availability, poverty, and educational levels. These provided contextual information on the local situation, number of users, area covered by the respective FUG, and problems faced by local communities related to forest resource conservation and use.

Key informants were selected from various organizations and groups including, CFUGs, the Conservation Area Management Committee (CAMC) and the Annapurna Conservation Area Office. They were asked basic questions such as overall changes and fears regarding the future as well as specific questions relating to CF, including challenges faced in CF implementation; contributions of CF to people's livelihoods; its impacts on resources, social structures, infrastructure, education, and income; and suggestions for improvement.

Finally, 72 households were surveyed using a standard questionnaire to measure the contribution of CF to poverty reduction at the household level. In selected FUGs, wellbeing ranking was also carried out by dividing households into four strata (rich, medium poor, poor, and ultra-poor) with at least four to eight households randomly sampled from each strata depending on population size in different areas. A total of 32, 20, and 16 households, respectively, in the Inner Terai (which had the largest CFUG), Middle Hills, and Conservation Area Forests (CAFs) of the high hills were randomly sampled. The main basis for income calculation was households' self-reported activities and product prices (Pandit et al., 2009; Bamberger, 2009). For this study, income was classified into three main categories: forest income (from timber, fodder, fuelwood, leaf litter, and NTFPs), farm income (crops and livestock), and non-farm income (wage labor, remittances, pensions, and business). The valuation of fodder, grasses, fuelwood, and other multipurpose species was done using both existing market prices and the contingent valuation method (CVM)—willingness to pay and accept methods.

This chapter is organized as follows. The next section discusses systems of AF and CF practiced in the hills of Nepal and their relations. Sections three and four discuss the contributions of AF and CF, respectively, to food security, livelihoods, and poverty reduction in terms of the measurement indicators used for the study, and the final section identifies existing gaps and offers recommendations.

8 *A VDC is the lowest stratum of the governance structure consisting of nine wards, each of which is composed of one or more villages/settlements or communities depending upon the population. In mountainous and hill districts, wards are normally spread over large areas that include village settlements or communities having few households.*

5.2 Agroforestry and community forestry systems in Nepal's hills and their relations

5.2.1 Agroforestry practices in the hills of Nepal

As an interface between agriculture and forestry, agroforestry is considered a promising and sustainable land use practice, especially in developing countries, for maintaining or increasing agricultural productivity while preserving and even improving land fertility and quality (Malla, 2000; Neupane and Thapa, 2001). Forests and trees have been an integral part of subsistence farming systems in developing countries, adding diversity to farming systems and helping to sustain rural household economies (Nair, 1993; Arnold and Dewees 1997; Neupane et al., 2002). More recently, the environmental benefits of AF practices e.g. carbon sequestration have also been recognized (Nair et al., 2009). AF practices improve food and nutritional needs and mitigate environmental degradation by combining trees and crops in spatial and temporal arrangements (Sinclair, 1999; Nair, 2007). AF can also provide supportive benefits in specific social and environmental contexts across a range of landscapes and economies.

AF practices have special significance in the Nepalese hill context as they are integral and sustaining components of existing farming systems that also support livestock-raising and generate forest products for household consumption (Carter, 1992; Amatya and Newman, 1993; Garforth et al., 1999; Schmidt-Vogt, 1999; Neupane et al., 2002). Traditionally hill farmers self-managed trees in different types of land to meet fodder and fuelwood requirements and to maintain land productivity. However, in recent years, these practices have failed to meet fodder requirements and replenish soil nutrients to increase food production.

Most AF species are observed growing naturally on farm edges and boundaries with upland crops and on the walls of gullies and *kharbari* (barren lands) where some varieties of thatch grasses naturally occur. During the last decade, NAF has introduced some improved fodder trees and grasses that are also planted, closely spaced, on terrace edges and risers. In the study area, the rural population was found to derive a substantial proportion of their daily supplies of raw materials from AF species. These include *Arundinaria intermedia* (*nigalo*) used for making bamboo baskets and mats, and fruits of *Myrica esculenta* (kafal), *Terminalia*, and *Emblica*. Common high elevation AF species in the study area are: *Ficus semicordata* (Raikhaniyo), *Arundinaria intermedia* (*Nigalo*), *Saurauja nepalensis* (Gogan), *Brasiopsis hainla* (Chuletro), *Ficus nemoralis* (Dudhilo), *Myrica esculenta* (Kaphal) and *Prunus cerasoides* (Pyainyu). Similarly *Ficus lacor* (Kabro), *Litsea monopetala* (Kutmiro), *Artocarpus lakucha* (Baddar), *Bauhinia purpurea* (Tanki), *Emblica officinalis* (Amla), *Shorea robusta* (Sal) and *Schima wallichii* (Chilaune) are typical lower elevation species. Of the various species listed above, most are grown for fodder and have multiple values as fodder, fuelwood, timber, and NTFPs. Some of the exotic fodder tree species introduced by NAF in the study area are: *Leucaena leucocephala*, *L. diversifolia*, and *Flemingia congesta*.

5.2.2 Community forestry in the hills

Forests in Nepal play an integral role in rural livelihoods through the provision of basic household and agricultural resources, notably fuelwood, timber, and fodder as well as essential inputs for some rural livelihood such as wood for pot-making (FAO, 2010; Springate-Baginsky et al., 2003). The Nepalese government has experimented with various community-based forest management models to devolve power to the local level and reduce poverty. Of these the community forestry model whereby all stakeholders within a community have an equal chance to participate has proved the most powerful (Malla, 2001). The leasehold forestry (LF) model is considered more relevant for poverty reduction, but its outcomes require further assessment.

Nepal's CF program was established in the late 1980s in response to national and international concerns about severe environmental degradation and has since been widely implemented with over 17,600 CFUGs holding legal use rights over designated forest areas. CFUGs have engaged approximately 2.1 million households and govern roughly 1.7 million ha of forest area (Table 10). More than two-thirds of the CFUGs (72%) and 64.5% of the total user households involved in CF management in Nepal are located in the Middle Hills. CF accounts also account for more than half of the total income and expenditure in this region.

Table 10. Distribution of CFUGs, area, user households, and income and expenditure by geographical region

Geographical region)	No. of CFUGs	Area (ha)	No. of HHs	Average income NPR/yr/CFUG	Average expenses-NPR/yr
High hills	2830	266,007	291,451	14712 (10)	6395
Middle hills	12,812	1,090,398	1,405,286	24194 (27)	13556
Inner Terai or Terai	2043	296,249	481,157	98863 (7)	62397
Total	17685	1,652,654	2,177,894	45923	27449

Source: DoF, Community forestry Division, 2011.

Note: Figures in parentheses are numbers of districts in which FUG income was recorded.

CFUGs have begun to generate income streams and benefits for local people (Kanel and Dahal, 2008; Luintel et al., 2009), with increased livelihood benefits facilitated by a government decision to allocate 35% of CFUG incomes to the poor. However, key second generation issues that have emerged include increasing the level of livelihood benefits and their distributional equity (Kanel and Dahal, 2008; Nurse and Malla, 2005). There are several external conditions that limit CFUGs' contributions to livelihoods such as poor market access and infrastructure and the conservation orientation of the original program (Pandit et al., 2008). Local socio-political and institutional factors, including weak CFUG governance and the tendency to replicate traditional village hierarchies (Pokharel and Niraula, 2004) are also increasingly recognized as limiting influences.

5.2.3 The relationship between AF and CF in the hill context

The complex hill topography creates a delicate balance between forest resources and farming practices. It has been estimated that every hectare of cultivated land needs 2/8 ha of unmanaged forest to provide sufficient fodder for livestock without damaging the forests (Wyatt-Smith, 1982). In the Middle Hills, dependency of households on tree resources has increased with the subsistence needs of a growing population and livestock pressure and decreasing and deteriorating forest areas (Abington, 1992; Neupane and Thapa, 2001; Gilmour et al., 2004). This situation indicates the vulnerability of the existing hill farming system in the context of changing access to forest resources, coupled with the emergence of major land use issues such as increased soil erosion, reduced soil fertility, and reduced agricultural productivity (Neupane et al., 2002). If AF and CF can be combined, this situation can be alleviated and the hill environment can be protected while improving people's livelihoods.

Nepal's heavy reliance on land-based agriculture makes it hard to justify protection of forest land without improving AF farming conditions. As almost 80% of people depend on land and forests, they have strong stakes in land use. The total area of Nepal is 14.7 million ha of which agricultural areas (irrigated and non-irrigated fields) comprise 21%. Non-cultivated areas constitute about 7% of the land area and are interspersed between agricultural fields. Most of these feature trees, and in some cases, can be treated as agroforestry areas. However the farming system is complex, involving agriculture, livestock, and forests that in combination supply the subsistence

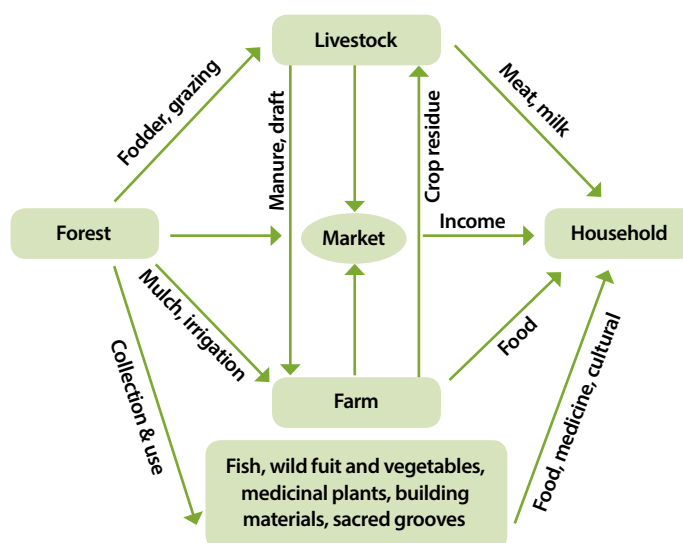


Figure 5. Integrating forestry and agriculture (Joshi et al. 2010)

needs of a typical hill household. Many farmers maintain trees in their farmland, practicing several types of agroforestry and collecting fuelwood, leaf litter, and fodder from these trees. Apart from supporting local livelihoods, this type of management system has contributed to diversifying livelihoods and increasing socio-ecological resilience against climate change. Both agriculture and forestry are equally important in these complex farming systems, and cannot be separated. There is considerable scope for increasing the productivity of both agriculture and forests for increased benefits for farming communities (Carson, 1992; Joshi et al., 2010). Since sustainable land management of non-forest land has the potential to be a significant source of rural income, Nepal must include agriculture and other land-use changes beyond pure forestry in its negotiation strategy.

5.3 Contribution of agroforestry to food security and livelihoods

5.3.1 Defining food security and livelihoods

The multidimensional nature of food security includes food availability, access, stability, and utilization. It is achieved “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life” (World Food Summit, 1996).

The DFID sustainable livelihoods model, revised by McDougall et al. (2004) and Hobley (2012), includes all spheres of capital—human, economic, natural, physical, and social, and reveals households’ livelihood processes and their outcomes resulting from any external interventions (McDougall et al., 2004). Carney (1998) provides a useful definition of a livelihood as comprising the capabilities, assets (both human and social resources), and activities required as a means of living. It is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets now and in the future without undermining the natural resource base. At the core of this definition is the idea that households build their livelihoods based on their assets and available opportunities. Their “livelihood assets” are augmented through “entitlements” to locally available capital, such as tree and forest resources. The level of assets varies across households in the same locality. For example, the poorest households may have to depend entirely on their own work and on entitlement to common property resources (Dev et al., 2003). Households arrive at a “livelihood strategy” and engage in livelihood activities based on available resources.

5.3.2 Agroforestry contributions

(i) Changes in Human Capital

Developing human capital for an individual’s capabilities to secure wellbeing is a cumulative and multiplicative process for which not just training, but also other forms of social, economic, and physical capital are very important. It can range from new organizing roles for women on committees to oversee savings groups to saving through accessible drinking water or labor-saving agricultural technologies. More free time enables the poor to invest their time in knowledge enhancement and skill generating activities (Dev et al., 2003). Agroforestry has contributed in various ways to improving human capital, and has been assessed in terms of leadership development, an increasing literacy rate, access to information, and improved children’s health. In many communities where AF has been promoted, leadership, particularly of women from marginalized communities, has been enhanced.

In the NAF study area in Raswa District, 24 farmer leaders (with an equal ratio of males and females) from 12 groups received home nursery farmer leaders’ training for promoting medicinal and aromatic plants (MAPs) in private lands. They in turn trained 260 farmers in their villages with a satisfactory transfer of knowledge and skills. Now women group members can stand up for their rights. Discussions with farmers revealed that this transfer of knowledge and skills relating to AF species and MAP nursery management, cultivation, and harvesting had a multiplier effect. Each farmer in the focus group discussion reported

that they had educated their neighbors, relatives, and colleagues on integrating MAPs into the existing AF system. Farmer leaders were also trained in marketing AF products, including NTFPs from private lands. Moreover, 12 farmers' groups federated into a single cooperative network that is currently engaged in marketing agroforestry products. With increased financial returns, locals have developed capacities to invest in education. An increase in the literacy rate from 43% to 57% during three years of an agroforestry project intervention was evident in the case study site.

(ii) Changes in financial capital

Financial capital generated through the establishment of credit and microcredit schemes can be a significant outcome of agroforestry/forestry interventions that can then be self-generating. There were 12 agroforestry groups in the first study site, each with its own savings used for credit and microcredit schemes. The total savings of these groups was more than NPR 600,000, with these funds used to promote AF related income-generating activities, including product marketing. Average household cash incomes among MAP growing farmers increased from NPR 31,084 in 2008 (prior to the project) to NPR 36,550 in July 2011 (at the end of the project). Whereas the mean household income generated from NTFPs/MAPs was only NPR 3,604 before the project started, it increased to NPR 6,500 in 2011, which accounted for 53% of the total change in household cash incomes. The second highest change in income was from livestock sales (40%), followed by hotel business (8%), and wage labor (5%). The increase in livestock and livestock product sales was attributed to improved nutrition as a result of introducing nutritious fodder trees and grasses on farms. These findings are supported by various studies that have revealed an increase in household cash incomes due to agroforestry interventions in the hills of Nepal (Neupane et al., 2002; Basukala, 2011).

A slight decline in cash crops and non-specified income sources in the AF system were mainly due to changes in cropping patterns and some shading effects. A decline in the sale of cash crops, particularly potatoes and vegetables, occurred because of the allocation of small patches of land for MAP cultivation in agroforestry plots. This reduced the total area under cash crops.

(iii) Changes in natural capital

AF interventions were observed to significantly contribute to reducing pressure on community and government managed forests evidenced by the increased cultivation of medicinal plants, fodder trees, and fruit trees in private farmland. More than two-thirds of respondent farmers claimed that species regeneration had occurred and that there was a significant increase in forest biodiversity. More than half of farming households in the surveyed communities had domesticated locally threatened species such as *Rheum emodi* (padamchal), *Valeriana jatamansi* (sugandhawal), and *Swertia chirayita*. The study also showed increased numbers of fodder, fuelwood, and timber species. A comparison of tree cultivation before and after the project revealed that the increase in cultivation of fodder species was highest compared with fruit trees as well as fuelwood and timber species. The total increase in numbers of trees cultivated by farmers after the agroforestry intervention was 147, which was almost double the number of trees cultivated prior to the intervention. This finding is supported by Carter and Gilmour (1989), who noted a significant increase in tree cover in private land in the Middle Hills of Nepal. This has not only increased numbers but also improved the biodiversity of AF species while also reducing pressure on the forests.

Box 1: Agroforestry has reduced pressure on forests and enriched soil organic matter

*Mr. Khil Nath Acharya, aged 50 years, has 15 family members. He started agroforestry six years ago. Prior to this he also grew some local fodder tree species. In the new plantation of one ha of farmland, he introduced almost 1,000 mixed legume and non-legume fodder tree species. Now he says, "I have ten large animals (six cattle and four buffaloes) and have enough green fodder for my animals for almost half the year. The rest of the fodder deficit is fulfilled by ground grasses and crop residues from my farmland." He claims that he hardly goes to the forest to collect fodder and fuelwood, because his fodder and fuelwood requirements are met from his farm. In addition to the above, the leaf litter from his agroforestry plantation has added enough organic matter to his farm crops. In the presence of the principal researcher in January 2011, he collected more than half a kilogram of dried leaf litter per square meter of land. The total organic matter collection from his farm was 5 tons/ha per year, which has significantly helped to enrich soil fertility. He further informed us that the introduction of legume fodder trees and grass species (such as *Leucaena* and *Flemingia* spp) have increased the soil's nitrogen content.*

(iv) Changes in social capital

A question that remains to be answered is how AF addresses the interests of disadvantaged groups such as the poor and marginalized and women. Since growing trees requires land in the first place, how can landless people practice AF? How has the issue of gender exclusion been addressed? These questions were incorporated by NAF into the design and implementation of the program. For example, in one of the AF training programs, almost 50% of participants were female, thus reducing the societal gender gap. Women were proportionally represented in each of the AF groups. To increase access of poorer households to credit facilities, priority was given to extremely poor households for borrowing loans from cooperatives. An outstanding example of how the problems of the landless and the poor were addressed by the project in Rasuwa district is the organization of a land rights campaign by the AF farmers' network in collaboration with the Community Self-Reliant Center (CSRC) in 2011. Pressure was exerted on the government to provide land certificates to hundreds of landless farmers in the district, resulting in around 200 landless families that had long been cultivating the land of "absentee" landlords getting land certificates. Thus, social capital was generated to address the livelihood needs of the poor.

(v) Changes in the level of food sufficiency

Before the project, 16% and 75% of the households could support themselves for three months and six months, respectively, using their own produce. These figures declined to 10% and 65%, respectively, after project implementation. However, whereas 9% of farming households were food sufficient for six months prior to the project, this figure increased to 24% after the project's implementation.

A slight change was observed in household income sources to cover the food deficit before and after the project's implementation. Farmers reported a marginal decline in dependence on wage labor and tourism work and a significant increase in incomes from AF and livestock. Income from sales of AF products, livestock, and livestock products have also reduced the frequency of loans borrowed from relatives/neighbors and wage labor (Table 11).

Table 11. Change in household income sources to cover the food deficit (N=120, multiple answers)

Source to cover food deficits	Before the project (No of HH)	At the end of the project (No of HH)	Change in Number of HH	Change (%)
Wage labor	11	6	-5	-45
Seasonal employment during tourist season	44	48	4	9
Loans from relatives/neighbors	25	5	-20	-80
Sale of cash crops (potato/vegetables)	62	65	3	5
Sale of livestock and livestock products	15	24	9	60
Sale of agroforestry products (NTFPs/MAPs)	20	33	13	65
Others (non-farm)	14	10	-4	-29

Source: Baseline survey 2008 and end line survey (2011)

5.4 Contribution of community forestry to livelihoods and poverty reduction

5.4.1 Community forestry contribution

As for the contribution of AF, the following discussion on CF contributions is based on the five main forms of capital or livelihood incomes, with data mostly derived from KAFCOL's case study as well as other reports and articles.

Table 12. Total land area, population, GDP, and forest cover

Description	Unit	Figure
Total land	Ha	14,300,000
Population	Density/km ²	2.1
	Growth rate (%)	1.8
	Rural (%)	83
GDP (2008*)	Per capita (ppp)	1104
	Growth rate (%)	5.3
Total Forest Area	Ha	3,636,000
	% of land area	25
Other wooded land	Ha	1,897,000
	% of land area	13
Forest cover change (%)	1990–2000	-2.09
	2000–2005	-1.39
	2005–2010	00

Source: FAO, 2008*, 2010 & World Bank, 2010

(i) Changes in natural capital

Forest cover conditions have improved in all of the surveyed CFUGs with a higher density of trees and crown cover observed in those handed over further back in time (Dev et al., 2003). Despite gaps in measurements of natural capital (biodiversity and forest cover), there has been a remarkable improvement in the overall forest condition as a result of community forestry interventions and in associated community income; a finding supported by Campbell (2012). The expansion and transformation of community forest management has institutionalized the process of reversing deforestation in Nepal's hill districts, substantiating the claim that Nepal's community forestry program has improved the condition of forests and increased incomes.

The study's assessment of people's perceptions of the fulfilment of their forest product needs indicated the highest satisfaction levels among the poor. Wealthy community members perceived the least "unfulfilled needs" largely as a result of their private resources, and in many cases, alternative fuel sources. Improved forest resources in all of the FUGs assessed in the study has been achieved because of effective forest management in terms of protecting forests from fires, illegal tree felling, and unregulated extraction of forest products. In Basant Hariyali CFUG, there has also been plantation of fodder trees and some NTFP species on barren land. While community forests are increasingly meeting livelihood needs, efforts of FUGs to resolve land disputes with individuals and neighboring FUGs are also reducing the extent of forest encroachment in some CFUGs in eastern Nepal. These all indicate an increase in natural capital.

A particularly promising example is Jaspur CF in Pyuthan district which has evidenced numerous socioeconomic and environmental benefits. The former include increased participation of dalits and other disadvantaged community members in the CFUG committee so that their voices are heard by the elite, and receipt of equal benefits by the poor and women from the use of fodder, fuelwood, and other forest products, with the exception of timber which has mostly been appropriated by the richer sections. Community members reported that more than 560 tons of leaf litter had been collected from this forest for compost-making, which has added organic manure to farmlands. This is a free resource that has simultaneously addressed the issue of excess removal of surface grasses and crop residue from farm lands that poses serious constraints to sustainable land management. While a total of 200 tons of fuelwood (dead wood and fallen branches) were collected from this CF in 2009/2010, fuelwood sales are less lucrative in Pyuthan because of the rural setting. The CF utilized 1.548 cubic feet of timber mostly for construction, repair, and maintenance of their houses.

(ii) Changes in infrastructure (physical capital)

In many CFUGs, particularly in the hills, community development activities have led to improved village level infrastructure (physical capital), including trail-making, drinking water supplies, support to schools through provision of teachers' salaries, funds and timber contributions for construction of community halls, temples, and monasteries, and village electrification (Dev et al., 2003). These activities have equally benefited all classes with significant amounts being spent on direct infrastructure development. Previous studies indicate an estimated average annual investment on infrastructure of NPR 28,366 by CFUGs (Pokharel, 2008, 2009). Table 13 below shows the allocation of funds within the three CFUGs in the study, with important areas of use being forest management, employment, and income generation activities apart from infrastructure development.

Table 13. Use of CFUG funds (NPR)

Activities	Name of Forest User Group		
	Basanta Hariyali CFUG, Dang	Jaspur CFUG, Pyuthan	Lete CFUG, Mustang
Forest Management (nursery, plantation, weeding, pruning, and thinning)	65060	40335	17364
School construction	-	452990	-
Drinking water	15266	-	12600
Road or trail improvement	-	-	29750
Income generation (asparagus cultivation, goat-raising, vegetable production, hotels, tailoring and other businesses)	52050	40119	254317
Employees (peons, watchers, and administration staff)	97252	54813	11033
Scholarships for poor and disadvantaged students	5000	-	-
Capacity building (training and study tours)	-	4709	46048
Total (Nepalese rupees)	234,628	592,966	371,112
Use of CFUG funds/year	46,925	118,593	74,222

Source: Field survey (2011)

(iii) Financial capital

Income Generation Activities (IGAs): There was an overall increase of IGAs in all of the study sites, with a notable increase in sites with CFUG-related IGAs targeting women and/or the poor. While many of the IGAs were small and relatively traditional, such as goat-rising, some were more innovative and ambitious, for example, the generation of a new livelihood and increased income through the successful establishment of a sawmill, following initial resistance, by a *dalit* group in Deurali-Bagedanda CFUG in Kaski district (Pandit et al., 2008). Among the three CFUGs in the study, Jaspur has generated the largest amount of collective funds—NPR 605,848— from the sale of timber over a five year period.

Contribution to household incomes: Forest income, which constitutes 26% of total household income in the study area, is considered a very important income source for all economic classes. The Middle Hill region evidenced the highest percentage of forest sector income compared with the high and inner Terai regions, which is attributed to the effectiveness of the community forestry program in this region. However, absolute income is almost the same in the high and Middle Hills. Whereas fuelwood contribution to the household economy is highest for the high hills (16%), timber contribution is higher in the Middle Hills (9%) and Terai region (7%) compared with the high hills. Overall, as can be seen from Table 14, dependence on forest products is highest in the Middle Hills (31%), followed by the high hills (26%), and the Terai (21%). However, the average income in all three sites is below the poverty line.

Table 14. Farm, forest and off-farm income per year per household

Income sources	Inner Terai CF		Middle Hill CF		High Hills CF		Total	
	NPR	%	NPR	%	NPR	%	NPR	%
Farm Crops								
– Crops	8789	11	11157	15	13138	18	11028	15
– Fruits and vegetables	5633	7	6854	9	5938	8	6141	8
– Livestock	14225	18	7500	10	3450	5	8392	11
Sub total	28646	36	25511	35	22525	31	25561	34
Forestry								
– Timber	5375	7	65266	9	625	1	4175	6
– Firewood	5448	7	7168	10	11969	16	8195	11
– Fodder	999	1	4070	6	1625	2	2231	3
– Leaf litter	250	0.32	1016	1		0	422	1
– NTFPs	4281	5	3854	5	4642	6	4259	6
Sub total	16353	21	22634	31	18860	26	19282	26
Off Farm								
– Pension	834	1	2400	3	3156	4	2130	3
– Salary and Remittance	19791	25	6510	9	8281	11	11527	15
– Business	12115	15	12780	18	19702	27	14866	20
– Labor	1136	1	2850	4	781	1	1589	2
Sub total	33876	43	24540	34	31921	44	30112	40
Grand Total	78875	100	72685	100	73307	100	74956	100

Source: Field survey (2011)

It is surprising to note that the highest percentage of income from off-farm sources occurs in the high hills. This is because the majority Thakali caste engage in enterprises, prominent among which are running lodges and restaurants and catering for foreign trekkers, but also small businesses such as teashops, mule transport, liquor distilleries, local trade, and other skill-based activities. The location of Lete VDC along a main trekking and pilgrimage route has resulted in income diversification. The bulk of labor required for running lodges/restaurants, including fuelwood cutting, is from outside the district.

Distribution of income among different classes of wellbeing: Given the prevalence of income inequality in Nepal, the study aimed to assess differences in income among four classes of wellbeing across various income sources and with a particular focus on forest income (Table 15). The overall contribution of the forest sector was highest for the ultra-poor groups (40%), followed by poor (26%), medium (24%), and rich households (16%). However absolute income from this sector was higher for medium and rich households with the rich receiving the highest income from timber (7%), followed in descending order by medium, poor, and ultra-poor households. In many cases, there is an equity concern regarding community forestry's contribution to the poor (Malla et al., 2003). While the ultra-poor receive the highest percentage of total household income from NTFPs and fuelwood, the absolute value that they receive is the lowest among the four groups.

Table 15. Distribution of income (NPR) by wellbeing class

Income Source	Wellbeing classes							
	Rich (food sufficient for whole year)		Medium (Food sufficient for 6-11 months)		Poor (Food sufficient for 3- 6 months)		Ultra poor (Food sufficient only for less than 3 months)	
	Income	%	Income	%	Income	%	Income	%
Farm Produce								
– Crops	18150	15	11427	13	4519	7	2291	6
– Fruits and vegetables	3997	3	5208	6	5125	8	4070	11
– Livestock	9653	8	9322	10	8606	13	1354	3
Sub total	31799	26	25956	29	18250	28	7715	20
Forestry								
– Timber	8437	7	5464	6	3854	6	755	2
– Firewood	3982	3	8754	10	7148	11	10245	26
– Fodder	2602	2	2149	2	1966	3	2040	5
– Leaf litter	390	0	342	0	615	1	226	1
– NTFPs	4312	4	4875	5	3074	5	2320	6
Sub total	19724	16	21583	24	16656	26	15586	40
Off Farm								
– Pension	4667	4	4822	5	2596	4	0	0
– Salary and Remittance	29615	24	19500	22	5209	8	2991	8
– Business	37179	30	17571	20	14791	23	11733	30
– Labor	0	0	0	0	6696	10	714	2
Sub total	71461	58	41893	47	29293	46	15438	40
Grand Total	122984	100	89432	100	64199	100	38739	100

Source: Household survey (2011)

Microcredit: There has been an increase in sites with pro-poor small loan programs in many CFUGs across all elevation zones. However, while CFUG loans are all designated as “pro-poor,” they are distributed to members of all wealth categories as with other kinds of support. An example is Manakamana CFUG where the Adaptive Collaborative Management (ACM) approach was implemented. The loan amounts increased significantly and the loans distributed to the poor increased by more than nine-fold (from NPR 54,000 to 455,000) (McDougall et al. unpublished). This indicates a considerable shift in loans to the poor. In CFUGs in western Nepal, loans are generally borrowed by medium or rich households though the trend of taking loans among the poor has shown a recent increase. A study by Pokharel et al. (2009) in the western Nepalese hills showed that poor households received 67% and 53% of the total value of loans distributed to CFUGs in 2008 and 2007, respectively.

Contribution to employment: Part-time CFUG-related positions such as forest watcher, nursery worker, and NTFP collector, and in some cases, executive committee roles, have also increased, including for the poor and women. Hobley (2012) found that an average of 640 person days of employment per CFUG were generated at an average daily wage of NPR 200 (for unskilled manual labor), amounting to an income contribution by the CFUG of NPR 128,000. With most CFUGs having between 100 and 150 members, this is equivalent to a direct transfer of NPR 850–1280 per household (equivalent to 4–6 days of occasional unskilled labor). Further, larger forests (more than 100 ha) provide more employment, particularly for *dalits* and the extreme poor. If unpaid, informal employment is included, this figure increases almost tenfold.

A study carried out by ERI on behalf of MoFSC and LFP indicated that the forest sector provides employment equivalent to 1,658,099 full time jobs per annum on a national basis. Of these, 91.3% are in the formal sector: 67% for fodder collection, 26% for fuelwood collection, and 7% for timber collection, and other products. These employees were comprised of 54% of *janajatis* and 7% of *dalits* (ERI, 2011).

(iv) Social/institutional capital

Several studies have demonstrated the success of community forestry in accumulating social and institutional capital, which particularly empowers *dalits* and marginalized communities in accessing income generation opportunities. This is evident in areas where ACM has been implemented (Box 2) and results in institutions that are capable of making robust decisions using fair processes. Project-supported CFUGs evidence greater provisions for implementing activities for socially excluded groups. Most decisions are made by the general assembly and executive committee, the mechanism relating to the nature of the decision. Executive committees are dominated by Brahmin/Chettri middle classes, but there is an evolving practice of consultation with excluded groups such as women and the poor with provisions to consult through *tole* and other group members prior to proposing any policy level amendments (Pandit, 2008; Hobley, 2012).

Box 2: Economic empowerment through enhanced social harmony between Dalits and non-Dalits in Deurali-Baghedanda CFUG in Kaski District

In 2004, with the implementation of the PAR project funded by IDRC and New ERA, *tole* users and the EC came to support the BK *tole*'s plan in principle, including the *tole*'s holding full authority. The CFUG committee even undertook the necessary legal procedures, such as providing licenses to the BK *tole* to cut dead and fallen timber. The *tole* carried out a feasibility study and estimated the costs for establishing a sawmill. The research project's change agents helped to develop a proposal based on this information. The committee forwarded the sawmill proposal to the CFUG's General Assembly in 2005 and the Assembly approved it as an income-generating activity of the BK *tole*. The stumbling block of the proposed plan was the funding to establish the enterprise. Neither the *tole* nor the CFUG had been able to secure the needed funds. At this point, with the encouragement and engagement of the ACM-based meso network for Hansapur, District FECOFUN submitted a proposal to New ERA for funding. FECOFUN succeeded in acquiring funds (NPR 80,000/-) for the initiative from New ERA in 2006. Backed enthusiastically by the Hansapur CFUG network, FECOFUN is managing the sawmill funds as 'revolving funds'. Specifically, six poor members from the BK *tole* in Deurali-Bagedanda CFUG worked in the sawmill. The estimated income from this enterprise was NPR 27,000/month of which NPR. 24,000 was paid to the 6 laborers. Of the balance amount (NPR 3000), 50% was deposited in the CFUG's bank account to be used later to provide loans to other poor members of neighboring CFUGs. In this way the sawmill has been paying back its loan to FECOFUN. This CFUG has established a good relationship between *dalits* and non-*dalits* members in Hansapur.

Source: McDougall et al. 2007

(v) Human capital

There are few examples in traditional community forestry programs of targeted training across caste/ethnic groups, classes of wellbeing, and gender. However, in recent years, project-funded training programs have focused on developing the leadership skills of women and poor and marginalized households, which are given high priority. In many project-supported CFUGs, these groups have developed leadership capacities (Box 3), and with the exception of some ultra-poor households, a significant number of *dalit* and women-headed households have found a voice outside of the CFUGs.

Box 3: Women's leadership capacities increased in CFUG committee

Secretary of the Basanta Hariyali CFUG committee, Ms. Laxmi Buda said that women and marginalized users (13 out of 21 users were from indigenous and *dalit* communities) had increased in the CFUG committee and were enthusiastically participating. In the beginning there were no women in the committee, but now there were six women, of whom four were *dalits*. "We are making decisions in favor of women and the poor to provide CFUG funds and forest resources in an equitable manner." She added, "I am working for the CFUG as a CFUG staff and am paid NPR 2000/month." With such direct benefits, the participation of women and the poor in CFUG activities including decision making has been increasing. We are more hopeful that this system will continue in the future so that we can ensure that CF benefits are directed to the poor and to the women". She further noted: "In the past our voice was not considered, but nowadays what we say is also counted and we are asked as well. We women are counted in the decision- making process, which happened much less in the past".

Source: Pandit, 2012

5.5 Existing gaps and recommendations

5.5.1 Agroforestry

- AF's contribution has not been limited to economic returns, It has also provided a number of environmental (land rehabilitation, control of soil loss, and environmental amelioration) and social benefits. Until now, these benefits have not been considered in terms of their poverty alleviation aspects. The Government should recognize and account for these values in the GDP to achieve the MDG and three year approach targets.
- Marginal and degraded lands and their terrace risers have not been effectively utilized in Nepal's hills and mountains. Fear of legal issues concerning registration of private trees and NTFPs has slowed down the progress of agroforestry. Therefore, the registration process for private trees, which is currently complex and time consuming, should be revisited for effective utilization of marginal lands.
- Poor users frequently complained of the small size of their land (<0.5 ha) which is not, therefore, suitable for attempting tree-based agroforestry. The Government should develop and design a community-based agroforestry program for the landless and small land holders based on the leasehold concept.

5.5.2 Community forestry

- The community forestry program has provided more "space" for marginalized users to participate in decision-making through innovative processes and institutional arrangements, especially nested (small community-based) decision making. Increasing space for the voices of marginalized users is very important for obtaining—and retaining—their interests in the CFUG agenda in the long run. However, there is a danger of overexploitation of forest resources if the government is not able to monitor its resources given a scarcity of staff. Strengthening coordination between government staff and community forestry officials would help sustain forest resources.
- With the exception of a few project-supported CFUGs, there is a concern regarding equitable representation and participation of poor and deprived community members in CFUG committees. Leadership positions (e.g. vice chair and secretary) are sometimes but not always occupied by women and marginalized group members. An increase in leadership positions would necessarily guarantee a change in the actual "space" of decision-making.
- The issue of income disparities between the rich and poor can be addressed by providing more space and access rights to poorer households. The provision of allocating 35% of the CFUG income to identified poor households should be strictly enforced by the Government.
- The community forestry handover process has currently slowed down in the Middle Hills. The Government should focus on sustaining and improving livelihood options by maintaining existing CFUGs.
- It was apparent that most of the fuelwood, timber, fodder, and NTFP production from community forests that were locally used and not sold were also accounted for in calculations of the economic contribution of community forests. This has significantly increased their contribution to livelihoods and poverty reduction. Till now, the Government has not undertaken a calculation for defining the contribution of community forests to poverty reduction. This study has identified several deficiencies in the current national income and forest accounting framework which need to be addressed.

CHAPTER SIX: ABANDONED AGRICULTURAL LAND IN NEPAL'S MIDDLE HILLS: STATUS, CAUSES, AND CONSEQUENCES

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6.1 Introduction

Agriculture is central to the livelihoods of most rural communities in Nepal, with almost 80 percent of households involved in agriculture, generating one-third of the country's total GDP (ADB, 2011). However, only about 21 percent of Nepal's land surface is arable land, with the Middle Hills accounting for 40.4 percent of the total arable land and 44.3 percent of the population (CBS, 2002). However, the availability of arable land is rapidly declining. More than 55 percent of holdings were smaller than 0.5 ha in 2010 (CBS, 2011), with 4.25 million out of a total of 56.6 million households being landless (CSRC, 2012). Given the evident scarcity of land resources, it is important to understand how existing arable land is being used.

Over the last two decades, Nepal's Middle Hills have witnessed an increase in land abandonment. There are multiple drivers of this change that include social, economic, cultural, and ecological dimensions, as well as agricultural technologies. The relationship between land and migration is also complex and multidimensional (Gartaula et al., 2012), with smallholders and landless households, in particular, choosing outmigration as the preferred option due to their limited access to productive land.

Outmigration and a remittance economy are not new in Nepal; they have been evident for the past 200 years (Adhikari, 2006). However, current levels of outmigrating farmers, abandoning their productive land resources, are unprecedented. More than four million young Nepali farmers are working outside the country as labor, and the remittance economy contributes to 30 percent of the GDP (World Bank, 2009). This association of a remittance economy with economically active labor, primarily male, has been the most powerful force driving the transformation of lives, livelihoods, and landscapes, particularly in the Middle Hills (Paudel and Adhikari, 2010), with trends of labor shortage, feminization of agricultural work, and dependency on imported food being increasingly evident.

The average rural household in the Middle Hills derives a significant proportion of its livelihood from non-farm incomes (33%) and remittances (16%). However, the remittance share for poor and marginalized households is nominal. Moreover, traditional small scale subsistence is no longer a viable practice for generating incomes to meet households' increasing cash demands. Further, landlessness, decreasing access to productive natural resources, low returns on labor and other investments, and increasing demands for cash to pay for health, education, and other social services are disincentives for communities to continue farming in these hills.

A recent trend has been the abandoning of privately owned agricultural land by households with one or more family members who have migrated out of the area. An early study of three village development committees (VDCs) by Malla (1992) showed that the proportion of abandoned land was around 7.5 percent, and mainly consisted of *Bari* (rain fed upland). However, subsequent studies suggest that the proportion of agricultural land being left idle is significant (Thapa, 2001; Khanal, 2002; Gautam, 2004). This has a tremendous impact on food security and local livelihoods in areas already experiencing mass poverty and food deficits (Khanal and Watanabe, 2006). Leaving land idle also has negative consequences on fragile mountain ecologies, particularly hill slopes that have been terraced and managed for centuries through considerable labor inputs (Jodha, 1992).

Against this background, this study aims to explore the scale of abandonment of agricultural land, current trends and types of abandoned land, as well as the underlying causes and consequences of land abandonment in relation to the challenges of food security and livelihoods of communities in the Middle Hills. Its specific objectives are to:

- Assess the scale and pattern of land abandonment in four selected sites over the past few decades;
- Assess the type and distribution of abandoned or underutilized agricultural land in specific eco-belts of the Middle Hills;
- Assess categories of farmers who are abandoning their land;
- Analyze the driving forces behind land abandonment; and
- Analyze the consequences of land abandonment for food security, and their linkages to various social transformation factors such as migration, feminization of agricultural labor, and monetization of the local economy.

Both qualitative and quantitative methods were used for this assessment. Participatory rural appraisal (PRA) techniques were used, followed by a survey of 248 households in selected VDCs within four districts: in the central (Kavre), western (Lamjung and Parbat), and mid-western (Pyuthan) regions of Nepal. Focus group discussions, meetings and consultations, and case studies were also used to collect relevant data.

The four districts were selected based on the following broad criteria: districts where the Nepal Australia Forestry Project was implemented; high/low levels of accessibility; and high/low levels of migration, food security, and conflict impacts.

VDCs were selected through district level consultations based on the above criteria. Meetings with key stakeholders (District Forest, Agriculture, and Livestock Departments, as well as FECOFUN district chapters) were held at district headquarters. These discussions helped to identify, shortlist, and finally select VDCs in the districts based on key criteria. Meetings with key actors were also held at the VDC level. The following criteria were used to ensure representative samples: mixed caste/ethnic groups; coverage of three ecological belts (low, middle, and high); and representativeness of abandoned land.

To briefly outline the research process, a survey questionnaire was designed to assess land holdings, outmigration, and the status of land abandonment, particularly that of *Khet* (paddy/irrigated land) and *Bari* (rain fed upland). Focus group discussions (FGDs) and PRA tools were also used to assess land use status, trends, types of abandoned land, and the causes and consequences of land abandonment. The data collection process involved the following key steps:

- FGDs, followed by social and resource mapping, and mapping of abandoned land;
- Case studies of individual farmers;
- A household survey; and
- Group discussions and consultations with VDC officials and district stakeholders.

These methods were supplemented by study team observations and some informal interviews held with key informants at the national level.

The chapter is organized as follows. Following this introductory section, which describes the background of the study, and its objectives and methodology, field data is presented on the status, trends, types, and causes of land abandonment. The third and fourth sections focus, respectively, on the findings of the study and a discussion of these findings, and the fifth section offers conclusions.

6.2 A summary of field case studies

6.2.1 A profile of the districts and vdc's selected for the study

For this study, four districts—Kavre, Pyuthan, Parbat, and Lamjung—were selected within the Middle Hills, ranging from 610 m to 4,877 m. The selection was based on the following criteria: accessibility, food security, and districts where the Nepal-Australia Forestry Project had previously been implemented. Table 16 shows the areas and populations of the four districts. Of these, Lamjung was the biggest district with the largest population, and Parbat was the smallest district.

Table 16. Areas and populations of the study districts

Districts/Characteristics	Nepal	Kavre	Pyuthan	Parbat	Lamjung
Area (sq. km)	147 181	1404.86	1328.9	536.86	1692
Population	26620809	385672	212484	147076	1692104

Development criteria and the socioeconomic and resource statuses of the selected districts are shown in Table 17. This data indicates that in terms of overall indicators, Kavre is the most developed district and Pyuthan is the least developed district in the study sample. In all of the districts, agriculture and forestry constitute the major economic base and source of livelihoods. Predictably, as shown in Table 18, the proportion of the migrating population is highest in Pyuthan and lowest in Kavre.

Table 17. Development indicators for the study districts

Districts/ Criteria	Kavre	Pyuthan	Parbat	Lamjung
Poverty and deprivation index	Most developed Ranked: 18	Least developed Ranked: 54	Intermediate Ranked: 39	Intermediate Ranked: 35
Marginal farm households ⁹	Intermediate 32.97%	Least developed 39.10%	Least developed 50.29%	Least developed 52.03%
Socioeconomic and infrastructure dev. index	Most developed Ranked: 12	Least developed Ranked: 57	Most developed Ranked: 23	Intermediate Ranked: 30
Percentage of absent male members (>14 years age) ¹⁰	<5%	>20%	>20%	>20%
Accessibility	High	Low	Medium	Medium
Food security	Medium	Medium	Low	Medium

⁹ *Districts of Nepal, Indicators of Development, update 2003, ICIMOD*

¹⁰ *Labour Migration: Opportunities and Challenges for Mountain Livelihoods. Sustainable Mountain Development, No. 59, Summer 2011*

Table 18. Absentee population percentage in each study district

	Kavre	Lamjung	Parbat	Pyuthan
Total Population	3,89,959	1,69,104	1,47,076	2,35,165
Absent Population (Abroad)	14,237 (3.65%)	21,293 (12.59%)	22,148 (15.05%)	37,878 (16.10%)

Source: District Development Profile of Nepal, 2012

A total of six VDCs were selected in the four districts based on criteria such as accessibility, migration estimates, food security, and the impacts of conflict during the insurgency. Based on their discussions of these criteria, district stakeholders selected the most appropriate VDCs for the study, as shown in Table 19. All of these VDCs were highly accessible apart from Chaubas, which was moderately accessible.

Table 19. Selection criteria and characteristics of selected VDCs

District	VDCs	Accessibility	Migration	Food security	Conflict affected
Kavre			35111	-18512	
	Darune Pokhari	High			Low
	Chaubas	Medium			Low
Parbat					
	Aarthar	High	14835	14840	Low
Lamjung					
	Nalma	High	11956	12620	Medium
Pyuthan					
	Khalanga	High	5464	-21525	Low

Source: District Development Profile of Nepal, 2012

Table 20. Development status in terms of various indicators of selected VDCs

Districts	VDCs	Total hhs	Human Development Index: Rank	Dependency on agriculture	Dominant livelihood strategy
Kavre	Daraune Pokhari	620	0.394: 23rd	High: Subsistence	Agriculture, Livestock
	Chaubas	491		High: Subsistence	Agriculture, Livestock
Parbat	Aarthar	741	0.451: 12th	Medium: Subsistence	Migration, Agriculture, Livestock and job holders
Lamjung	Nalma	476	0.429: 14th	High: Subsistence	Agriculture, Livestock
Pyuthan	Khalanga	1268	0.281: 50th	High: Subsistence	Agriculture, Livestock
	Maranthana	1222		High: Subsistence	Agriculture, Livestock

Source: District Development Profile of Nepal, 2012 and Districts of Nepal, Indicators of Development, update 2003, ICIMOD

As Table 20 indicates, the selected districts varied in terms of their Human Development Index (HDI), with that of Pyuthan being the lowest. While subsistence agriculture was predominant, multiple livelihood strategies were evident in all the districts.

6.2.2 Results of the household survey in the selected VDCs

(i) Kavre District: Daraune Pokhari and Chaubas VDCs

Dharaune Pokhari VDC has a total population of 3286, with 620 households, while the population of Chaubas VDC is 2447, with 491 households. As Table 21 shows, 94 households, in total, were surveyed in these two VDCs, and the average household size was 6.89 persons. The VDCs were characteristically agrarian, with 33.59 percent of households dependent on agriculture as their major livelihood source. Caste and ethnicity were diverse, and only four percent of households were *dalit*.

Table 21. Household survey results for VDCs in Kavre District

Total households surveyed	94		
Average family size	6.89		
Dependency on agriculture	33.59%		
Ethnic Groups	BCTS	Indigenous	Dalit
	48	42	4
Migration	22.51%		
Total barren land (Khet and Bari)	17.9%		
Food security status (food secure months)	>12	9-12	<6
	18.22%	36.31%	45.45%

Around 22.51 percent of the total number of households had migrated and 17.9 percent of the total land area (2246.20 hectares) was left barren. Concerned stakeholders estimated that 25 percent of the total land in Kavre District had been abandoned.

Regarding food security status, only 18.22 percent of the total population was able to secure food for 12 months from their own production, relying for the rest on multiple livelihood sources to secure food. While initially people abandoned comparatively marginal land, now, in some cases, even land near their houses is being abandoned.

(ii) Parbat District: Aarthar VDC

The total population of Aarthar VDC is 3436, with 751 households. As Table 22 shows, 49 households, with an average size of 6.45 persons per household, were surveyed in this VDC. The majority of households were Gurung, with a few (nine) *dalit* households. The percentage of the total population that had migrated was 20.25 percent.

Aarthar has experienced considerable migration—seasonal and temporary—for well over a decade. This has led to a declining agricultural labor force, contributing to land abandonment. Migration has peaked, with Pokara being a major study and work destination. Foreign employment is more attractive compared with agriculture among the youth, and the majority of households have at least one pensioner from the Indian or British army.

Table 22. Household survey results for Aarthar VDC in Parbat district

Total households surveyed	49		
Average family size	6.45		
Dependency on agriculture	30.38		
Ethnic Groups	BCTS	Indigenous	Dalit
	-	40	9
Migration	20.25%		
Total barren land (Khet and Bari)	36.08%		
Food security status (food secure months)	>12	9-12	<6
	11.11%	28.88%	60%

In Aarthar, 36.8 percent of the total land area, including both *Khet* and *Bari*, are left barren and this phenomenon has been in evidence for 10 to 15, and even 20 years. While incomes are relatively higher compared with those in other VDCs in Parbat, the scarcity of human resources, accelerated by the increasing migration rate, have contributed to the expanded area of abandoned land.

(iii) Lamjung District: Nalma VDC

Nalma VDC has a total population of 2323, with 476 households. Fifty households were surveyed in this VDC, with an average household size of 6.18 persons (see Table 23). Communities are predominantly indigenous, with a few *dalit* households. A total of 27.83 percent of the village population has migrated out, and 28.03 percent of the total land area, including both *Khet* and *Bari*, has been abandoned. The increasing area of abandoned land can be attributed to the rising intensity of migration of the active labor force from the area in search of education, livelihood opportunities, and better lifestyles.

Only 20 percent of surveyed households were able to secure food from their own production for 12 months. Around 71% of the population is dependent on other income sources as the households' own production can only support them for less than six months.

Table 23. Household survey results for Nalma VDC in Lamjung district

Total households surveyed	50		
Average family size	6.18		
Dependency on agriculture	34.95%		
Ethnic Groups	BCTS	Indigenous	Dalit
	-	48	2
Migration	27.83%		
Total barren land (Khet and Bari)	28.03%		
Food security status (food secure months)	>12	9-12	<6
	20.48%	8.16%	71.42%

(iv) Pyuthan District: Khalanga and Maranthana VDCs

Khalanga VDC has a total population of 5663, with 1268 households, while Maranthana VDC has a population of 5871, with 1222 households. As Table 23 shows, 55 households, in total, were surveyed in these VDCs, with an average household size of 5.41 persons. Both VDCs are ethnically diverse. Around 14 percent of the total population of the two VDCs has migrated, and approximately 19 percent of the total land area has been abandoned. According to key resource persons, approximately 41.7 percent of the total cultivated land has been abandoned in Pyuthan District as a whole.

Regarding the food security status of these two VDCs, only 20 percent of the total households are able to secure food for 12 months from their own production. Around 48 percent of the households have to rely on other sources as they can only support themselves with food from their own farming for less than six months.

Table 24. Household survey results for Khalanga and Maranthana VDCs in Pyuthan district

Total households surveyed	55		
Average family size	5.41		
Dependency on agriculture	38.92%		
Ethnic Groups	BCTS	Indigenous	Dalit
	26	15	14
Migration	13.84%		
Total barren land (Khet and Bari)	18.80%		
Food security status (food secure months)	>12	9-12	<6
	20%	32%	48%

6.2.3 Causes of land abandonment in the study sites

The increasing migration rate, especially of youth, to urban areas and abroad in search of better education facilities, lucrative jobs, and better lifestyles, is one of the main reasons behind the rising trend of land abandonment. This has led to massive labor shortages in agricultural activities and local markets and higher labor charges, with only children, women, and elders remaining in the communities. This acts as a disincentive for *adhiyaa* (share cropping). Moreover, farmers are changing their cropping patterns by decreasing the number of crops per cropping cycle (from three crops to one crop a year).

Local economies are becoming increasingly dependent on remittances and pensions. Family members, left behind, are less inclined to pursue agriculture given its associated hardships. Local people prefer livestock rearing to crop production, because of lower labor requirements for the former, and are increasingly converting their previously cultivated land into grazing land.

Another underlying reason for land abandonment in the four districts is the fact that agriculture is becoming increasingly unattractive as a result of several factors. These include: high investments and low returns; lack of supporting infrastructure and irrigation; insufficient inputs such as seeds and fertilizer; inaccessibility of markets (physical as well as in terms of information, capacities, and techniques); and shifting rainfall patterns (climate change), compelling farmers, who cannot adapt their cropping practices to the changing climate, to leave their land barren.

Because of labor shortages and the high costs of inputs, farmers are forced to prioritize their land in terms of distance and marginality. This has led to increasing abandonment of land that is inaccessible (at a distance from their homes) and marginal. Some land areas near forests are left barren because of the likelihood of crop damage by grazing animals and wildlife. In addition, households that migrated out during the period of conflict have permanently settled in their adopted cities and towns, leaving their land abandoned.

The availability of only seasonal irrigation has been a further aggravating factor. Additionally, the growing trend of haphazard road construction has contributed to previously productive land becoming increasingly marginalized and less productive owing to landslides accelerated by road damage.

There are reported cases of real estate activities in previously cultivated land, especially in Pyuthan District, which is also contributing to land being left barren. These activities encourage farmers to sell their agricultural land to obtain immediate cash. As mentioned, climate change, notably the shift in the rainy season, has also led to abandonment of land that was previously cultivated. For example, late rain in May and early June does not allow farmers to plant maize at the proper time, resulting in land abandonment.

6.2.4 Consequences of land abandonment in the study sites

Abandonment of land has local as well as wider consequences. The following consequences were reported in the field sites.

- In Kavre and Pyuthan, most of the abandoned agricultural land has been gradually converted into grazing land, providing fodder and grass for livestock.
- In Parbat, the abandoned land has been transformed into an area resembling forest. Abandoned areas situated near forests, and at a distance from the community, are being encroached by forest and wildlife.
- In all of the field sites, abandoned land has been increasingly encroached by alien species such as *Nilo Gandhe*, *Jhar* (*Ageratum conyzoides*) and *Banmara* (*Eupatorium* spp.).
- The immediate impact of abandoned land is on household food security, consequently affecting the nation's capacity to fulfil its food demands through its own production.
- Inter-linkages between different farm components are being disrupted as a result of both the causes and consequences of land abandonment, e.g., dependency of farm animals on agriculture for forage and dependence of agriculture on livestock for manure.

- Abandoned agricultural land is transforming into areas resembling forests, resulting in more damage caused by wildlife to surrounding settlements.
- The decreased availability of local food has increased dependency on retail goods and introduced food items that have resulted in changes in food habits. This has further intensified the problem as the poor, in particular, are forced to seek income generating alternatives to be able to afford these items.

6.3 Key findings of the study

6.3.1 The scale of land abandonment

Compared with the findings of earlier studies in various locations (Malla, 1992; Thapa, 2001; Khanal, 2002; Gautam, 2004; Khanal and Watanabe, 2006), this study revealed relatively higher percentages of abandoned agricultural areas in the surveyed districts, in relation to the total agricultural land. These figures ranged from 17.9–36.8% (see Figure 6), and may even have been even higher due to variations in survey data and data from other sources.

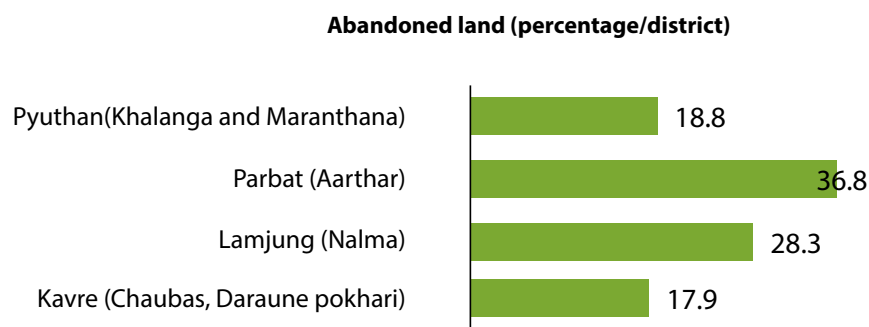


Figure 6. Scale of land abandonment

As Figure 6 shows, the scale of land abandonment is higher in Parbat and Lamjung than in Pyuthan and Kavre districts. While factors influencing land abandonment vary from site to site, and cannot be generalized, the high levels in Parbat and Lamjung can largely be attributed to permanent and temporary outmigration. Other contributing factors are proximity to urban areas and access to alternative income sources. In Kavre, much of this land is being used for planting grass and fodder for livestock, as well as being converted into fruit orchards. Since this area is situated close to a market, with road access, and has fertile soil compared with other sites, farmers are cultivating vegetables and cash crops. In Pyuthan, by contrast, these activities are neither productive, nor profitable, and are not, therefore, feasible. Consequently, the scale of land abandonment is comparatively lower in the absence of alternative livelihood options.

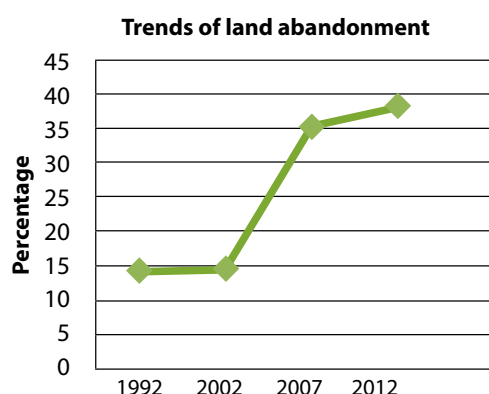


Figure 7. Trends of land abandonment

6.3.2 Land abandonment trends

The traditional farming practice was to leave marginal agricultural land fallow for a few years to enable it to regenerate its productive capacity. However, currently, such land has been observed to be permanently abandoned. Figure 7 shows land abandonment trends over a period of two decades. It is evident that the rate of land abandonment accelerated between 2002 and 2007.

6.3.3 Types of abandoned land and ecological belts

(i) Abandoned *Khet* and *Bari* land

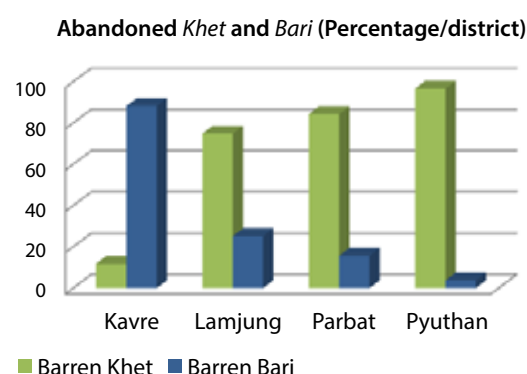


Figure 8. Abandoned *Khet* and *Bari* land

located at considerable distances from the houses, and, further, incur high costs of labor to prepare fields and large supplies of inputs, as well as expenditure of time and resources for practices like weeding. Given the migration of the younger, more active labor force, the remaining elders are only able to cultivate nearby land, leaving distant plots fallow. This was also observed in Parbat and Pyuthan districts.

(ii) Land abandonment in different ecological belts

Land abandonment percentages by eco region (Percentage)

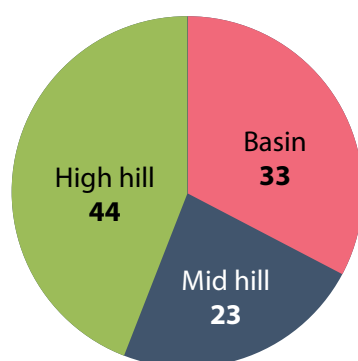


Figure 9. Land abandonment percentages by eco-zones

In all of the study sites, the land that had been abandoned was mainly distant and less fertile, situated in proximity to forests. However, there were also a number of cases of well-irrigated rice fields being abandoned, particularly in Lamjung and Parbat districts. As Figure 8 shows, many farmers have abandoned land that was formerly paddy fields. On average, two-thirds of *Khet* and one-third of *Bari* land has been abandoned. While this finding appears counterintuitive given the meaning of *Khet* as “well irrigated and fertile”, compared with *Bari*, most of the abandoned *Khet* land is marginal and only used for rice cultivation. These already degraded *Khet* areas are

The Middle Hills can be categorized into three zones in terms of elevation: upper, middle, and lower hills. Microclimates, soil quality, and types of flora and fauna vary across these three zones, which also favor particular agro-ecological practices.

In the study sites, as shown in Figure 9, the percentages of abandoned land in upper, middle, and lower zones were 44 percent, 23 percent, and 33 percent, respectively. Given the location of a large proportion of marginal land at upper elevations, the percentage of abandoned land was correspondingly higher in this zone. The middle zone is mostly comprised of residential areas, and the percentage of abandoned agricultural land is, therefore, lower in this zone.

6.3.4 Categories of households that are abandoning farmland

Table 25. Land abandonment by class categories

Class	Barren land (in percentage)
Rich	17.7
Middle	16.3
Poor	49.0
Ultra poor	17.0

more to cash-providing wage labor. Farmers in the study sites pointed out that the returns from investments in labor and other inputs required for cultivating these lands are low.

Regarding the association between land abandonment and household categories, as Table 25 shows, the percentage of abandoned land is highest among poor households (49 percent). This is mainly because land belonging to poor households is marginal and situated at considerable distances from their homes. As people increasingly find cultivation of marginal land to be unprofitable, they are turning

The decade-long Maoist conflict is a further factor that has compelled many people to leave their villages and permanently abandon their land. Most of these households have been relatively better off. While much of this land is cultivated by poor households, supported by Maoists, there are many areas that have been left unused due to continued uncertainty and fear.

Table 26. Average land holdings and abandoned agricultural land by caste/ethnicity

Caste/ ethnicity	Average holding (in Ropani)		
	Khet	Bari	Abandoned
BCTS	2.3	17.2	5.5
Ethnic group	8.3	9.1	6.1
Dalits	1.8	8.9	4.5

Average land holdings vary across caste/ethnic groups. In contrast to many other districts, members of the *Janajati* caste own larger land holdings, on average, followed by *Brahmins*, *Chhetris*, *Thakuri*, *Sanyasis* and *Dalits*. However, these caste/ethnic groups own more *Bari* than *Khet* land. Moreover, there are no significant differences in land abandonment across caste/ethnic groups. As Table 26 shows, the extent of abandonment of agriculture land is more or less similar among the caste/ethnic groups.

According to farmers and stakeholders in our study sites, abandoned agriculture land is usually marginal and of poor productivity. This does not mean that all of the cultivated land is productive and profitable for farmers. However, the abandoned plots are particularly poor in terms of their productivity. In many cases, innovative farmers have started using abandoned land to cultivate fodder and grasses, as well as to plant NTFPs (in Kavre), cardamom (in Lamjung) and trees (in all the sites).

6.3.5 Driving factors of land abandonment

Based on our field observations, as well as discussions and collective reflections with farmers, and with stakeholders in the study districts, various internal and external causes of land abandonment were identified. These are listed below, in Table 27, for each of the districts.

Table 27. Internal and external causes of land abandonment

Kavre		Lamjung		Parbat		Pyuthan	
Internal	External	Internal	External	Internal	External	Internal	External
Frequent wildlife damage	Urban job opportunities	Outmigration for jobs	Foreign jobs	Outmigration for jobs	Foreign jobs	Outmigration	Foreign jobs
Outmigration	Shifting agro-occupations (dairy)	Alternative income sources (pensions, domestic and foreign jobs)	Migration to urban areas	Migration to urban areas	Migration to urban areas	Lack of irrigation	Migration to the Terai
Marginal land close to forests (unirrigated)	Increased alternative income sources	Rural road construction	Changes in food habits	Alternative income sources (pensions, domestic and foreign jobs)	Changes in food habits	Low productivity of land	Changes in food habits
Changes in land use (fodder grown for livestock)	Attraction of foreign jobs among youth	Crop damage by wildlife	Attraction of urban lifestyles	Labor shortage or expenses	Attraction of urban lifestyles	Crop damage by wildlife	Seasonal migration
Low returns on investments		Changes in rainfall patterns, drought, and degrading water sources	Preference for nonfarm labor	Low returns on investments	Preference for nonfarm labor	Changes in rainfall patterns, drought, and decreased water sources	
Changes in rainfall pattern, drought, and decreased water sources		Distance of fields		Decreased land productivity		Distance of fields	
Distance of fields		Low returns on investments		Labor shortage		Agricultural land damaged by road construction	
Landslides and road damage		Reduced land productivity		Reduced share cropping		Increased incomes with diverse sources	

Although the primary causes of land abandonment varied across the different sites, the key push and pull factors were mostly the same in all of the sites. These can be divided into four categories: socioeconomic, production technology, cultural and production technology, and culture and biophysical factors. These are depicted in Figure 10.

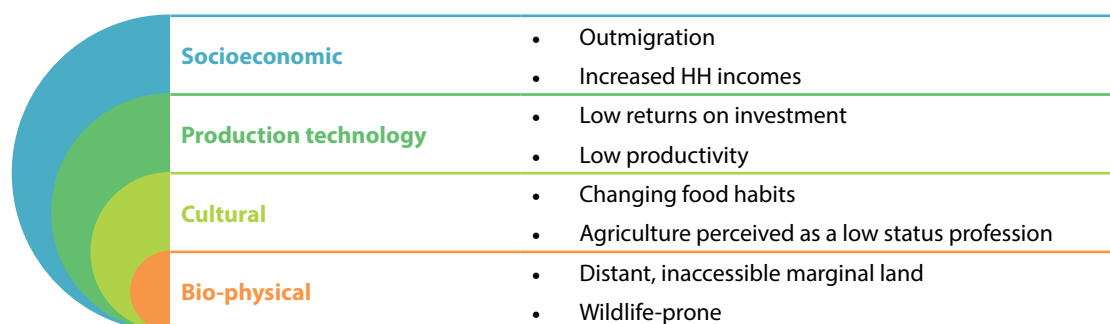


Figure 10. Causes of land abandonment

Of the four causative factors relating to land abandonment, shown in Figure 10, the first set—socioeconomic changes in rural landscapes—and especially outmigration—have been observed to be the triggering factors. This is confirmed by the data presented in Figure 11, which shows parallel trends of abandoned agricultural land and migration across the study sites.

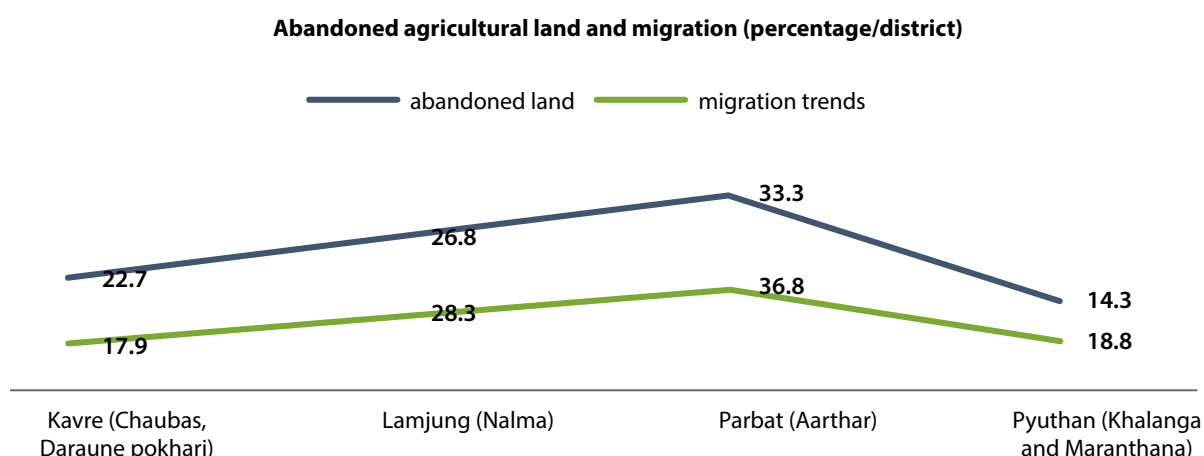


Figure 11. Abandoned agricultural land and migration

As Table 28 shows, none of the study sites were found to be food secure in terms of their locally based production. It has been observed that in areas with high migration rates, the abandonment of farming is a common tendency. This has negative impacts, not just locally, but on overall national food production. This situation leads to food insecurity among the poor and marginalized. Moreover, in areas with high migration rates, decreased labor availability has hampered livestock-based enterprises, resulting in less manure and increased reliance on imported inputs.

Table 28. Migration and food security of study districts

Selected Sites		Migration (urban and outmigration)	Food sufficiency through households' own farm production (secure months)		
			>12	9-12	<6
Kavre	Daraune Pokhari	22.33%	20.45%	38.63%	40.90%
	Chaubas	22.70%	16%	34%	50%
Lamjung	Nalma	27.83%	20.48%	8.16%	71.42%
Parbat	Aarthar	20.25%	11.11%	28.88%	60%
Pyuthan	Maranthana/ Khalanga	13.84%	20%	32%	48%

According to respondents in the villages, many educated young people prefer not to engage in agriculture as their main livelihood source, because they believe that this is the work of unskilled and uneducated people. Even among those who are educated in agricultural techniques, farming is their least preferred work. As a well-known proverb states: “*panch padhyo halo chhodyo das padhyo thalo*” (“those educated up to grade five leave the plough, and those up to grade ten leave the village.”) In general, then, agriculture is projected as hard, laborious, and undesirable work.

Similarly, intensive hill farming is not considered a viable option for maintaining a household economy. Consequently, many young farmers are abandoning their farms. During focus group discussions, farmers clearly indicated a number of problems associated with farming such as increased drought, uncertainty of rainfall, diseases and pests, as well as non-pollination of crops. In addition, they noted the gradual decline of water sources and the drying up of many streams.

6.4 Discussion of the study's findings

The findings of our field study suggest that land abandonment is occurring on a large scale across the study sites (section 6.3.1). As data presented in section 6.3.2 shows, the trend of land abandonment has increased in recent years. The evident acceleration of this trend during the last decade has occurred in parallel with extensive outmigration. Moreover, larger plots of agricultural land are increasingly being abandoned in all of the sites, particularly those that are located near forests, are at considerable distances from the settlements, and have low productivity potential. Our study suggests that labor shortage is a major constraint for the practice of agriculture across the Middle Hills.

Whereas in the 1990s, non-availability of land was the main limiting factor for agricultural production in the Middle Hills, currently, non-availability of labor is the key limiting factor. There have been visible changes/shifts in land use. For example, farmers are increasingly adopting less labor intensive agricultural practices. They have mostly abandoned their marginal and distant plots, as discussed in section 6.3.3, and have started planting fodder trees, grasses, fruits and other NTFP species. There has also been a change in cropping patterns because of labor shortages and increased labor costs. Farmers are adopting single crops during each cropping cycle, whereas earlier they used to grow two or three seasonal crops per cycle. One of the study's significant findings is farmers' bias toward the abandonment of *Khet* over *Bari* land, with approximately two-thirds of the *Khet* land having been abandoned compared with one-third of *Bari* land that has been abandoned.

Similarly, many poor farmers with small holdings, who were earlier sharecroppers, now prefer to earn cash as labor, and are leaving their own land barren. Two-thirds of the abandoned areas in the study sites belonged to poor and marginal farmers (see Table 25).

The main reason behind this is extensive outmigration of rural farming communities to urban areas and foreign countries, seeking employment. A further consequence of outmigration, in cases where family members obtain foreign employment, has been the movement out of rural villages of the remaining household members, along with unemployed youth and students, to nearby urban areas, the Terai, and

areas at road heads, seeking settlement, work opportunities, and study facilities, respectively. As shown by the data presented in Figure 11, land abandonment and migration are occurring in parallel with each other across the study sites. Thus, only elders, along with some women and their children remain in the villages. This has significant implications for women's workloads and the resulting feminization of agriculture work. The number of livestock in the villages has been reduced and marginal agriculture lands are being left idle. Moreover, trees and shrubs abound and are extending into to previously cultivated land. The reduced number of livestock per household lessens the availability of manure for application in the fields, thereby adversely affecting soil quality. This has further reduced production and productivity, and has resulted in further abandonment agricultural land. Consequently, abandoned agricultural land is transforming into forests, inviting more wildlife damage in the surrounding settlements, as claimed by the villagers.

There are visible impacts of climate change across the region. These include changes in rainfall patterns, increased droughts for longer periods, changes in the seasonal calendar, reduced water at source, and increased incidences of new diseases and pest species. These effects of climate change have also had significant impacts on land abandonment. However, these linkages need to be further explored to understand the dynamic ecological changes that are occurring, and their impacts on socioeconomic conditions of human populations in this region.

In particular, labor scarcity, mainly due to outmigration and resulting in fallow land, expands the scope of introducing relatively less labor intensive horticulture-based agroforestry in private land. Increasing demands for fruits, nuts, and other high value crops have also created market opportunities for agroforestry products.

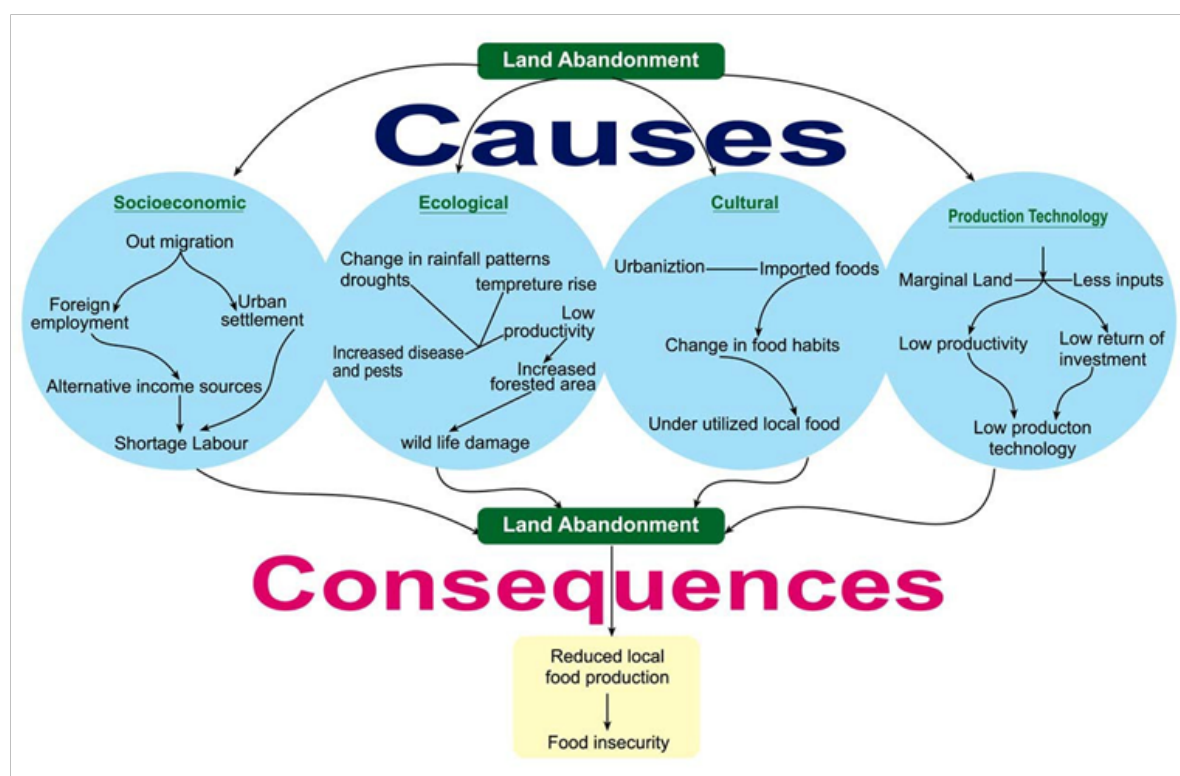


Figure 12. Causes and consequences of land abandonment

Figure 12 maps all of these factors and their contributions to abandonment of agricultural land, which has highly significant consequences for the food security of rural communities. Currently, there are no other livelihood options apart from agriculture for resource poor rural farmers as they have limited choices. As this study has revealed, if they improve their economic status, they will join the exodus migrating out of the villages, and if agriculture lands are not made more productive, more and more land will be abandoned. This shift from agriculture to other livelihood sources will eventually have far-reaching consequences for agricultural and rural development in Nepal's Middle Hills.

The household data in this study revealed that one-third of the cultivated land has been abandoned. This is equivalent to 18% of the total land cultivated in Nepal.¹¹ If such a large proportion of land remains abandoned in the long run, this will greatly affect the wellbeing of the populations and ecologies of these hills. Therefore, timely innovations in the utilization of abandoned private land are both pertinent and urgent. Moreover, various innovations relating to these abandoned lands could provide opportunities to support 4.25 million landless farming communities that are being deprived of basic livelihood resources.

6.5 Conclusions

This study has provided a glimpse of the status, trends, types, and associated factors of land abandonment based on a combined methodology of participatory observation and a household survey in the selected field sites. It has highlighted the issue of a rapid increase in abandoned land in this region, revealing that both absentee landholders, as well as the poor and marginal small holders, are abandoning their land. Agricultural land is mostly abandoned by households with family members employed in urban and foreign places. To date abandoned land has mostly consisted of marginal, distant plots of land, but well irrigated and fertile land is increasingly being abandoned too.

With approximately one-third of agricultural land across the Middle Hills being abandoned, proper utilization of this land to enhance its productivity is a key issue to be considered in relation to the incomes, employment, and food and livelihood security of poor and marginalized communities. We feel that there is a need to carry out more precise and detailed research on socioeconomic as well as technical aspects of agricultural land abandonment. This should include issues of land tenure and the functions of agriculture systems to develop a clear picture and road map for future interventions, particularly those relating to policy, legal, and institutional frameworks. This will facilitate the development of equitable benefit-sharing mechanisms and models for improving mechanisms of governance and the delivery of effective services and inputs necessary for improving the production and productivity of abandoned land.

¹¹ Out of the total arable land in Nepal, 56 percent is located in the Middle Hills (ADS, 2011).

CHAPTER SEVEN: CONSTRAINTS AND KNOWLEDGE GAPS IN AGROFORESTRY AND COMMUNITY FORESTRY IN NEPAL

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7.1 Introduction

This study examines prevalent constraints and gaps in knowledge relating to agroforestry (AF) and community forestry (CF) that have hindered optimum utilization and enhancement of food security and livelihood opportunities among communities and user groups in Nepal's Middle Hills. It reveals various external barriers and constraints for households, notably, those related to policies, technology, management, silviculture, enterprise development, and value chains and linkages.

Existing constraints and knowledge gaps relating to policies and regulation and to implementation at both the societal and community levels are major reasons why AF and CF have not succeeded in optimally enhancing livelihoods and food security in Nepal. This is particularly so in the Middle Hills where the population is dependent to a great extent on forests and forest products for their survival.

Household economies are predominantly agrarian, although this situation is rapidly changing, and coping strategies entail diversification into agriculture, animal husbandry, labor, trading, and migration. Households grow various agricultural crops such as maize, wheat, rye, potatoes, vegetables, and fruits to feed themselves, complemented by the raising of smaller livestock such as chickens, pigs, and goats. Richer households also keep sheep, yaks, buffaloes, and cows, while bee keeping is also a traditional complementary income-generating activity. As a consequence of these activities, households are closely tied to the land and forests for resources such as fodder, leaf litter, mulch, and water for irrigation and drinking, and for animals.

In a number of cases, forest institutions in Nepal limit rather than permit access of the poorest users to such resources (Regmi, et al., n.d.). This study examines in detail the constraints and knowledge gaps that prevent farmers and communities from realizing the full potential of agroforestry and community forestry systems to enhance livelihoods and improve food security. These have been analysed and categorized

under the following headings: government regulatory policies and practices; access to germplasm; technical issues and dimensions; social issues and dimensions; and jobs and incomes tied to market linkages, value addition, and the business, and finance environment. From a broader perspective, the study aims to identify research needs and priorities for improving AF and CF systems to enhance food security and livelihoods in Nepal's Middle Hills. Specifically it aims to: (1) review key literature pertaining to the constraints that prevent farmers and communities from realizing the full potential of AF and CF systems to enhance livelihoods and improve food security; (2) summarize these constraints; (3) identify knowledge gaps relating to the constraints; and (4) provide recommendations to narrow such gaps in knowledge.

The study team examined the internal-external dichotomy of constraints and gaps in knowledge. Constraints and barriers in the external environment that affected households were viewed as hindering factors, for example, those relating to policies, technical issues, and value chains. Internal barriers were found mainly within institutions, groups, and households. Thus, the team examined the roles and responsibilities of "duty bearers" and "right holders" within the evolving economy around natural resources in the Middle Hills of Nepal. This entailed a focus on issues relating to food security, income and employment, as well as poverty reduction, gender inclusion, and equity as important cross-cutting parameters.

While there have been numerous past studies and projects on Nepal's forests and how they can enhance livelihoods and food security, most were confined to local communities, especially poor and disadvantaged groups (Giri and Ojha, 2010). This study draws on their insights and findings, while simultaneously enriching them through primary validations based on first, second, and third person narratives of various stakeholders obtained through interviews.

Regarding the research methodology, interviews were held with key informants from relevant institutions and brief field visits were made to interview members of CFUGs, livestock user groups (LUGs), and farm households in and around Kathmandu, Lalitpur, Bhaktapur, and Kavrepalanchowk districts to understand the constraints that hinder AF and CF initiatives in the Middle Hills region.

The study utilized: (a) first person narratives entailing opinions and suggestions from members of CFUGs and farming households; (b) second person narratives of leaders and office bearers of CFUGs, CBOs and farm and financial cooperatives; and (c) third person narratives of relevant government agencies, INGOs, NGOs, and subject matter specialists in the CF and AF sectors, including academic and training institutions. This was supplemented by data from the available literature, which is extensive.

A total of 20 institutions were visited and 30 individuals interviewed. A series of meetings was also held with relevant primary and secondary stakeholders in the areas of forestry, government line agencies, CFUGs, and I/NGOs. A detailed questionnaire was developed to capture ideas and knowledge on the study issues, as well as facts and suggestions.

Regarding the study's limitations, it was largely based on a literature review, interviews, and focus group discussions (FGDs). The availability of recent literature in terms of AF and CF focusing on the Middle Hills of Nepal is insufficient, resulting in the study's reliance in some cases on dated books and journals.

The paper is organized as follows. In the next section, a review of the literature pertaining to an analysis of constraints and knowledge gaps is presented. The third section presents an analysis of specific constraints and knowledge gaps relating to community forestry and agroforestry, and the final section offers conclusions.

7.2 Literature review: key findings

7.2.1 Institutional constraints

A key finding is the exclusion of the poorest community members from the leasehold forestry (LF) program and ultimately from its benefits through implementation due to lack of awareness about the program. This

is often exacerbated by the remote geographical locations that limit the information flow and mobility of these groups (Regmi et al., n.d.). A second concern is the discriminatory nature of FUG institutions that result in exclusion of the marginalized poor at the bottom of the social hierarchy (ibid).

Two key constraints at the program implementation level are: the limited capacities of implementing agencies (DoF and DLSO); and supply-driven implementation which leads to lack of community consultation. In many instances, forest handover and selection of recipients has not been done in the intended manner. Despite the fact that participatory monitoring and evaluation are key programmatic features, these rarely occur in practice. These constraints can be attributed to three design flaws. These are: (1). A lack of systemized targeting of the poorest of the poor, who lack various resources and assets to enable their participation in activities other than those that give them immediate returns (ibid); (2) restrictive rules in CF and LF prohibiting cultivation of some crops in certain types of land that directly impact poor farmers; and (3) lack of bargaining power among CFUGs and LFUGs which are relatively small in size and may not, therefore, be considered by funding institutions.

7.2.2 Rent-seeking behavior and regulatory hurdles to NTFP enterprise development

Despite their potential to provide substantial employment and value addition for FUGs and local communities, the development of sustainable and pro-poor forest-based enterprises has been constrained by several factors. These include regulatory barriers and inadequate harvesting regimes, and limitations and constraints in processing technologies, market access, investment environments, private sector linkages, and infrastructure and program investments (Campbell, 2012).

There are also numerous remote users with little or no personal knowledge or connection to forests, depriving CFUG members of a sense of ownership and the ability to manage adjacent resources, which is central to the success of the program (ibid). Further, the Forest Department's (FD's) harvesting approval procedures ensure continuing FD control over CF planning and management, providing ample opportunities for non-transparent and questionable revenues (ibid).

The level of expansion and new investment is also low, and even established enterprises are discontinuing production for reasons such as inability to attract labor for seasonal work, problems sustaining product supplies, frustration with regulatory hurdles, and demands for legal and illegal payments (ibid).

Regulatory hurdles regarding harvesting, transport, processing, sales and export of tree and NTFP products can be directly attributed to corruption or rent-seeking of government employees. Moreover, there is a lack of reasonable apportioning of taxes and royalties between communities, private landowners, and the government at various levels (ibid). Further bureaucratic barriers to enterprise development also arise from contradictions in legislation and the revenue generation interests of local and district governments. Contractual systems, and especially artificial pricing for products such as medicinal plants and resin, do not provide level playing fields for communities and private tree growers. Instead, they may generate unrecorded commissions and bribes that lead to their endurance (ibid).

These barriers also impact on FUGs who are reluctant to harvest even the prescribed timber amounts. Perhaps the most counter-productive policy measure has been the ban on harvesting green (live) wood imposed in 2010/2011 in response to reports of illegal logging. This has undermined CFUG operational plans, discouraged investments in tree planting and enterprise development, and drastically reduced incomes for local communities and the Treasury. However, by creating artificial scarcity of timber products, it has substantially increased timber prices and, reportedly, incomes from corruption (ibid).

Other barriers to sustainable harvesting include wide-scale public misconceptions that harvesting of green trees is "bad" and lack of sustained education and support for making scientific silvicultural options accessible and comprehensible at national and local levels. Moreover, extortion of forced donations by political parties during and after the insurgency encouraged FUG members to retain their assets as trees rather than as cash (ibid).

Consequently, many forest-based enterprises are not healthy. They rarely provide dividends; labor conditions are unattractive compared to other alternatives; outdated technologies are not upgraded; and anticipated investments are not forthcoming (ibid).

7.2.3 Complicated registration process

Private land NTFP registration is affected by conflicting sectoral and cross-sectoral policies and legislation. Locally operative forest-based industries should either conduct a simple Initial Environmental Assessment (IEE) or a more complicated Environmental Impact Assessment (EIA) based on several criteria such as quantity of products to be harvested from a particular forest (Pandit, 2010). However, this rule only applies to root-based NTFP products such as kutki (*Picrorhiza scrophulariaefolia*) and sugandhawa (*Valeriana wallichii*). Up to 100 tons of other species can be harvested without EIAs (ibid).

The royalty system is another major constraint as it applies equally to NTFPs collected in the wild and grown in private land. Selling NTFPs such as *Taxus baccata* and the roots of *Nardostachys grandiflora* is illegal in Nepal, even if harvested from private land. Those found in possession of such NTFPs are arrested and harassed by FD officials and compelled to pay bribes (ibid). While a person or organization wishing to register a private forest with specific reference to tree species and their numbers may get this done by the DFO, there appears to be a lack of enforcement of contemporary policies, laws, rules, and regulations for the NTFP/medicinal and aromatic plants (MAP) subsector, particularly regarding cultivation and trading (ibid).

7.2.4 Knowledge gaps, especially among women and other backward classes

Having an effective voice to challenge and uphold rights requires possession of the right knowledge and the necessary skills to be able to articulate this knowledge and ensure that the rules of the game support individual entitlements (Hobley, 2012). Knowledge of rights and entitlements are thus critical to building the capabilities of individuals, particularly the poor and excluded, who suffer most from many knowledge gaps (ibid).

An analysis of knowledge gaps across all caste and ethnic groups indicates a relatively low level of knowledge about broader policy and legislative provisions. The level is much lower for extremely poor households in areas that are not related to their targeted needs (ibid). Within most CFUGs, men are more knowledgeable about forest management, including protection issues, cutting and climbing trees, and the CF governance framework than women (ibid). Although the knowledge base of women is complimentary to that of men, it is not given much importance, creating a barrier to their confidence in contributing to discussions and decisions in CF. The results of a survey indicated that in 46% of CFUGs, women rarely spoke (ibid).

The reasons for women's silence or low levels of engagement can be attributed to wider social barriers to their public engagement. Women often lack confidence to speak before others. Moreover, attendance is still considered sufficient and the focus remains on presence and has not progressed to the next two phases of speaking and then influencing – the three stages of building an effective voice (ibid).

Knowledge of how to become a group member is an important part of group formation. However, only 45% of extremely poor respondents in the above-mentioned survey knew the CFUG membership criteria as compared with 73% of the upper classes, reflecting the differentiated access to information and knowledge across wellbeing groups (ibid). This pattern also prevails among caste/ethnic groups with other backward castes displaying the lowest level of knowledge of membership criteria (33%) and high caste Janajati Newar households displaying the highest (62%) (ibid). A gendered division of knowledge is also notable with fewer women knowing their rights than men (ibid).

A similar pattern emerges for knowledge of user responsibilities with big differences in understanding between the upper class and other wellbeing groups, particularly disadvantaged households and women (ibid). Ongoing project districts and older CFUGs have comparatively better knowledge levels regarding both user rights and responsibilities (ibid). Knowledge regarding the handover of community forests, a highly tangible event, is, not surprisingly, better known.

Similarly, whereas there is a high level of knowledge concerning the existence of the CFUG executive committee, the knowledge level is lower concerning rules governing the functioning of the CFUG and associated rights. Surprisingly, knowledge regarding both these aspects is lower in project-supported districts and older CFUGs compared to non-project districts and newer CFUGs. Very few disadvantaged households know about the operational plan and constitution of the CFUG (ibid). One link between knowledge acquisition and understanding is actual participation in events where operational plans are developed and revised. However, there are consistent patterns of participation with lower levels of participation of the extreme poor and women compared to other wellbeing groups and men (ibid).

Knowledge of pro-poor provisions is equally low with only half the survey respondents being aware of these provisions in the operational plan and only 20% of disadvantaged households having any knowledge of them (ibid). Across wellbeing groups, knowledge of pro-poor targeting declined from 54% among upper class respondents to 38% of the middle class, and 48% of the extreme poor having no knowledge either way. There were also differences between men and women with women having less or no knowledge of these provisions (ibid).

Clearly those who may be expected to benefit most from these special provisions for women and poor and excluded groups have very limited knowledge about them. However, whereas women generally had less knowledge than men, those who headed households showed higher levels of knowledge than male heads of households regarding provisions for women in the operational plan (ibid).

Understanding broader policy and legislative provisions is also an important part of knowing individual rights. Across all groups, the knowledge level regarding framing provisions of the Master Plan for the Forestry Sector (MPFS) is very low, despite the fact that it is now over 20 years old. This is not surprising as such policy provisions do not have clear direct effects at the local level. However, taken together with an assessment of knowledge of legislation, regulations and changes, this demonstrates a worryingly low level of overall knowledge of rights and entitlements. Knowledge of legislation and the rights enshrined in it range between 4% of disadvantaged households to 26% of Brahmin/Chhetri households.

Extremely poor households display persistently low levels of knowledge regarding legislation and rights across all areas. An analysis of financial reporting processes shows that low levels of financial audits are coupled with low levels of knowledge about the financial affairs of CFUGs (ibid). This varies according to the size of the user group with larger user groups (more than 100 households) having much lower levels of knowledge (11%) compared with those with membership under 100. This supports Ostrom's work on the size of group membership. There appear to be critical levels beyond which a group gets too large to ensure effective communication of information and engagement of members (Hobley, 2012).

7.3 Analysis of constraints and knowledge gaps related to agroforestry and community forestry

This analysis is based on information and inputs gathered from (a) members of CFUGs and farming households; (b) CFUG leaders and office bearers, members of CBOs, and farm and financial cooperatives; and (c) relevant government agencies, INGOs, NGOs, and subject matter specialists in the community and agroforestry sector, including academic and training institutions. This was supplemented and validated by the available literature.

7.3.1 Rigid government regulatory policies and practices

Despite the existence of numerous well written and well intentioned policies, strategies, and papers, their implementation is the biggest constraint with heavy reliance on externally funded projects for undertaking implementation. The few existing government-funded projects are insufficient for technical training, research, and capacity building. Therefore, government officials lack motivation, morale, and incentives to undertake necessary work, which is, consequently, dependent on external funding and has short-term results.

(i) Lack of good governance

While gaps exist on both the government and CFUG sides after the handing over of management duties, lack of good governance on the part of government is the greater gap. In particular, a sensitive response and approach to the community for disseminating scientific knowledge while appreciating locally available traditional practical knowledge is lacking. A respectful, complimentary, and nurturing approach could enhance livelihoods and food security within communities through CF and AF.

Moreover, this disconnect has resulted in some CFUG members being less attentive to their own accountability, responsibility, and duties, and to their becoming more self-centered and focused on their immediate and narrow needs. Lack of an appropriate institutional environment and policies like free access to forests, restrictions on collecting certain NTFP species, and an unsatisfactory NTFP permit system has demotivated farmers regarding adoption of domesticated NTFPs (Pandit and Kumar, 2010). A lack of financial resources, coupled with that of motivation, incentives, rewards, and sanctions for government officials as well as CFUGs has to some extent fuelled corruption. Barriers relating to regulations for harvesting, transporting, processing, and selling/exporting NTFPs have led to a high level of corruption among government officials (Campbell, 2012).

While management gaps exist within government institutions, there are also motivational issues among user groups, which have become more focused on personal benefits than on the CFUG objectives. More recently misuse of rights and CFUG management issues after hand over have become problematic.

Forest products are mainly used for self-sustenance driven by needs, notably for fodder, fuelwood, litter, and mulch. Thus, their broader socioeconomic and environmental benefits are not widely apparent. What is missing is a profit-based orientation toward the private sector with positive responsibilities and stewardship of forest land resources. CF does not receive priority in the Government's national agenda unlike the hydropower sector which generates more visibility, prestige, income, and commercial profits for the relevant authorities. Priority in terms of resource areas is based on geography, population, size of financial contracts, and political expediency, thus serving as an impediment to sustainable management of natural resources. The government's exclusive focus on hydropower development as the only prioritized natural resource requires reconsideration as this would not be feasible without forests, and in a context of climate change that is leading to rapid glacial melt. Agriculture and forestry are critical areas of resource utilization and should be considered in an integrated manner rather than separately.

(ii) The disconnect between policy and implementation, including gaps in information and communication

A lack of uniformity in procedures in the absence of a suitable mechanism has led to a process gap in terms of facilitation. Optimal facilitation of CFUGs by government and non-governmental agencies is not possible due to a lack of procedures and process-orientated implementation norms, values, and capacities. Extreme politicization and interference also constrain motivated and well trained professionals. Limited capacities of existing implementing agencies (the DFO and DLSO) constrain implementation of appropriate forest-related policies using an integrated approach (Regmi et al., n.d.).

Added to these management and political problems is a knowledge gap in relation to understanding the importance of forests for improving the livelihoods of farmers and local communities. While the knowledge level among secondary stakeholders and duty bearers is adequate, it is not applied appropriately, creating

a vacuum in terms of practical action. This signals a major knowledge and communication gap within relevant government institutions and between the government and communities at large. While the level of knowledge concerning the existence of the executive committee is high among all households, it is lower concerning rules governing the functioning of the CFUG and associated rights, and, surprisingly, even lower in the case of project-supported districts and older CFUGs compared with newer CFUGs and non-project districts.

(iii) Gap in policy design and plan formulation and preparation

There is a gap in policy formulation and design. The intended targets of the policy are not specified as UGs are not represented at the policy-making level. Participation and effective ownership are, therefore, lacking after policy promulgation and policy designers tend to formulate technocratic policies. Annual plans are hurriedly prepared for submission to the National Planning Commission (NPC) for approval, with a token gesture and effort being made to involve CFUGs after preparation and submission to the NPC. Thus, although there are good policies, solutions, and strategies, implementation remains a weakness.

Prevailing policies are also rigid, lacking delegation, decentralization and devolution. As a result, effective local participation, decision making and coordination of relevant stakeholders is precluded. Public services and institutions are more motivated by self-interest, and less accountable to the public. Upward mobility and visibility receive more prominence and attention than grassroots level field work. It has been reported that farmers are discriminated against and oppressed by forestry officials, rangers, and DFOs. If found in possession of any produce or NTFPs, they are arrested and in many cases harassed by forestry officials, creating fear and discouraging them from domesticating NTFPs, and participating, to some extent, in forestry as a whole.

(iv) Lack of a clear agroforestry policy and of a new national policy and master plan for the forestry sector

Currently, there is no clear cut strategy for AF, which exists as a cross-cutting subject across different policies. Officials tend to treat agroforestry as a theme or tool for income and employment generation by farmers rather than as a forest management regime like CF. Hence, this sector has not received priority and importance in terms of how it is supporting livelihoods and food security among communities.

In the absence of an overall national forestry policy, a forestry sector strategy is currently under formulation. A new master plan for the forestry sector could not be developed in time for political reasons and because of a lack of resources.

Regarding resource sharing and land use, the Government works with CFUGs and private farms and encourages domestication of NTFPs and not just timber. However, this has not been adopted on a wide scale, which is necessary for successful management. Whereas there is free space and under-utilized farm land, this is not optimally used and there is currently no policy for addressing intense and sustained use of under-utilized public lands such as river banks, riparian areas, meadows, savannahs, gullies, and landslide-prone patches.

Farmers are apprehensive and reluctant to employ new technology relating to AF implementation as they fear this will destroy their limited land and productivity. This lack of awareness and reluctance to accept new ideas and innovation is a constraining factor leading to lower income generation and poverty. People are generally reluctant to plant fodder and fruit trees such as bananas, mangoes, pineapples, or fast growing fodder and fruit trees on their existing small holdings due to fear of failure and bad harvests. Moreover, the existence of very few registered private trees on either private land or tree farms is also a constraint. Actual participation in events entailing development, implementation, and revision of operational plans creates a link to knowledge acquisition and understanding. However, the elite are dominant in participation, representation, ownership, and decision making.

(v) Lack of incentives and an enabling environment for agroforestry and NTFP farmers

AF is mainly viewed as homestead gardening used by households as a coping and improvement strategy with few specialized or dedicated institutions to promote it. The major constraint for the organized growth of AF is the need to register private land to gainfully harvest and market products. While it is possible to legally register private trees with the DFO, the constraints and barriers that are encountered in this convoluted process act as a deterrent. A farmer requires several documents to apply and the process is slow, lengthy, cumbersome, and expensive for the farmer.

Loopholes in this system compel farmers to take the illegal route for growing, collecting, and marketing their NTFPs and forest products. Discussions with forest experts revealed a perception of lack of accountability among farmers as they chose to channel their products to avoid exorbitant royalty payments. This trend has arisen because of the mindset of government officials as being either conservative or corrupt, inhibiting the growth of the NTFP sector. Even while transporting products from one village to another, farmers have to take permission from forest rangers. Alteration of NTFP-related rules and regulations to make this process less cumbersome would benefit both farmers and the state.

There is also a knowledge gap on how AF can enhance livelihoods by generating additional income. The government is not totally aware of the various existing institutions concerned, such as academic, research, and training institutions. Farmers too are not knowledgeable about government agencies, I/NGOs, academic research institutions, and private commercial companies that can help them or buy their products. Instead they rely mostly on their traditional informal intuitive knowledge and systems. Thus, there is a three-way communication gap between farmers and various stakeholders, and a need for the Government to take proactive steps to facilitate and promote healthy cooperation between all these sectors.

(vi) Lack of comprehensive package development of NRM policies between the forestry, agriculture, and livestock sectors in Nepal

Extensive discussions with senior officials of government departments and their planning and evaluation departments, as well as academic institutions, revealed a pattern of financial resource crunch; lack of motivation among personnel; political interference and mismanagement; and lack of a coordinated and comprehensive package of policies, plans, and programs backed by resources and political will.

The lack of a new master plan the forestry sector and of effective implementation of agricultural perspective plans (APPs), compounded by nearly two decades of political chaos, confusion, and non-promulgation of the Nepal Constitution were also cited as key reasons for this maldevelopment and misdirection of the forestry and agricultural sectors. A significant constraint at the community and LFUG levels are exclusion of the poorest in the forestry program and the benefits it generates, and their displacement as a consequence of implementing any forestry-related policies (Regmi et al. n.d.). Lack of coordination, cooperation, and synergy between policy-makers, technical agencies of the government, academic institutions, the private, banking, and financial sectors, markets, and I/NGOs and international donors is also responsible for the malaise and nonperformance of these sectors in providing optimal food security and livelihood opportunities to reduce poverty and contribute toward human wellbeing and happiness.

7.3.2 Technical issues and access to germplasm

(i) Active forest management and a management operation plan (MOP)

Currently an estimated 80% of CFUGs are actively involved in preparing MOPs of their forests. These activities involve consultation and preparation of a simple yet detailed MOP featuring institutional and technical aspects. The institutional plan covers issues of good governance, election of office bearers, the legality of the CFUG and their terms of reference (TOR), and function on a daily basis.

The technical aspect consists of management, protection, sales, marketing and silviculture, including management and harvesting of NTFPs, thinning and pruning, and removal and allocation of fuelwood, fiber, timber, leaf litter, and biomass for lopping or ground grass as fodder. The MOP is usually prepared for a five-year period and then approved for two five-year terms after which the CFUG renegotiates the MOP with the district DFO for further ownership and stewardship of the forest. Technically and legally the land is owned by the state and the trees and land products are owned by the CF/LF user groups. If they fail to adhere to the TOR and MOU with the DFU, the state has a right to annul the latter and the CF/LF can revert back to the state.

One of the reasons for the government handing over degraded forests to communities in the first place was that the state was unable to manage national forests actively or effectively to their detriment. The only option for the government was, therefore, to declare forests as protected or allow nature to regenerate naturally occurring and reseeding native species such as sal and sisao.

There are currently over 18,000 CFUGs and some 2,500 LF UGs stewarding 20% of the national forest and covering nearly 2 million hectares of surface area (DFO and Interim Three Year Plan/NPC, 2010). Technical, managerial, supervisory, and monitoring oversight is a considerable challenge for the DFO which can, therefore, only undertake limited oversight. This is due to limited financial and human resources and the challenge of covering Nepal's vast, difficult, and undulating terrain. There are five regional government forest training centers in each of the development regions, which have limited reach, lack staff morale, and only carry out limited extension and training on institutional aspects.

FECOFUN, on the other hand, claims that increasing numbers of CFUGs are able to provide silvicultural knowledge and management support to their own groups. In the current national scenario of limited human and financial resources and high political manipulation and mismanagement by forest personnel, it is important to strengthen CFUGs and FECOFUN to meet most of the required capacity to prepare their own MOPs and effectively carry out their management plan.

(ii) Improved sustainable forest management and green wood (forest) certification

Nepal's community and leasehold forestry programs, and agroforestry, are seen as among the most progressive, and have been well studied. Yet there is no system of green wood certification or of sustainable forest management (SFM) and institutes. Current efforts at remote sensing of national forests (even though preliminary) would help in the preparation of a better master plan. Likewise, it would help in developing forest certification and green wood management by ensuring that sustainable forest harvests are carried out in community and leasehold forests and in private farms, as well as in national and state forests based on sound environmental norms and laws. Such forest management practices could yield increased products and provide more income and employment opportunities for rural communities through various evolving practices. These include: payment for environmental services (PES), REDD+, and other carbon offset credits and benefits from clean development mechanisms (CDMs) based on the (non-binding) International Kyoto Protocol for climate change (1991).

Forests and natural resources are managed globally within the SEE framework, which blends sustainable development and sustainable forest management by considering social benefits, including spiritual and recreational benefits; economic benefits, including jobs, income, and national economic growth; and environmental benefits such as greenery, clean water and air, carbon sequestration, and green energy from biomass and hydroelectricity. This system is new to Nepal and CFUGs and LF UGs, and private tree farmers have not been made aware of the possibilities that exist for communities and farmers to shift within a continuum of preservation, protection, and conservation to sustainable forest management for the wellbeing of all in Nepal's Middle Hills.

(iii) Access to improved germplasm

Nepal is biologically rich and diverse with more than 6,000 woody plants, over 500 species of fauna, birds, and insects, and 8,000 medicinal and aromatic plants (Master Plan for Preservation of Biological Diversity, 1988). Most of the native trees grown for timber, fiber, and fuelwood are indigenous while only a few fast-growing species of ornamental and commercial trees have been introduced as exotic varieties.

However, native and exotic plants have not been inventoried, selected, promoted, and propagated to an ideal extent. Currently, germplasm is being developed in DoF nurseries in 75 districts. There are also farmer- and CFUG-managed private nurseries for forest trees, fodder, and fruit trees. The Government has created a plant resource division as well as a tree improvement project within the DoF and community forestry division in Kathmandu.

An impressive amount of work has been carried out by these departments in the past. The Plant Resource Department has carried out several studies related to aromatic, medicinal, and fruit plants, including potatoes, bananas, and orchids. Similarly, the Tree Improvement Project within the DoF's Community Forestry Division has established an impressive array of tree improvement orchards, some 37 seedling collections and improved tree orchards throughout the country, and some ecological seed tree improvement research centers. However, despite these past donor-supported efforts, both of these institutions are almost non-functional due to the current lack of funds, polemics, and lack of priority and vision for improving genetic stocks and other scientific and technical capacities.

While impressive technical and scientific capacities exist within these institutions in terms of trained personnel, they are demoralized due to lack of resources and leadership. Limited biotechnology capacities exist since there are no advanced laboratory facilities, nor a refrigeration system to preserve and protect genomes and gene pools as part of sophisticated germplasm technology. Moreover, the national center for tree improvement in Kathmandu is almost dysfunctional due to lack of patronage and financial resources. The situation is comparable for the National Plant Resources Department where scientists and botanists are at a major disadvantage since they are not on par with the hierarchical forester culture within the DoF. This means that the rich knowledge and experience garnered through research and development are not being put to good implementational use by the DoF.

Within the Department of Agriculture and Livestock, limited agroforestry seeds are collected and propagated by farmers in each district. Capacities relating to biotechnology and germplasm exist in the National Agricultural Research Center (NARC) which has so far preserved 8,000 germplasm, mostly from agricultural crops. Consequently, Nepal does have a seed bank that is fairly rich in agricultural seeds and some MAPs, and this germplasm storage is an important method for solving the challenge of food security in the twenty-first century. However, it is a costly technology and reliable power supplies and cyro-technology (freezing DNA, genomes, and germplasm in media such as liquid nitrogen much below freezing temperatures, e.g. minus 78 degrees Fahrenheit) pose challenges. This technology also calls for non-rusting, hermetically sealed containers that can preserve germplasm for hundreds of years.¹²

NARC currently has "refrigeration technology" for preserving germplasm for 5–10 years within its campus in Khumaltar. This work is supported by ICIMOD and there is a plan to upgrade the capacity to 50–100 years. However, apart from costs, this will require a generator given erratic power supplies, which in turn is vulnerable to shortages of essential petroleum and diesel, thus creating a vicious cycle in the proper storage and preservation of essential food crops, including forest and agroforestry species.

When Pakribas Agricultural Center (PAC) and Lumle Agricultural Center ((LAC) were fully functional and supported by British aid, active research was conducted at these two centers on the use of tissue cultures for potato, banana, and cardamom, including prevention of viral diseases. However, more could not be accomplished due to lack of financial and human resources.

(iv) The disconnect between scientific professional knowledge and indigenous farmers' knowledge

Issues around soil degradation, deforestation, and transfer of ownership and management of forests to CFUGs had led farmers to seek livelihood-sustaining alternatives. Agroforestry is one such alternative involving both indigenous and exotic fodder species in private farms (Neupane et al., 2002). A major constraint for agroforestry farmers is their lack of technical knowledge of alley cropping, agro-silviculture, and horticulture. Moreover, agroforestry technologies are highly location- and region-specific (Jha et al., 2000).

¹² *Pyro-technology denotes the opposite of cyro-technology, ensuring processes and manufacturing in high heat conditions which Nepal lacks as well.*

Most forestry staff are also reluctant to learn about indigenous knowledge systems of farmers who have centuries of know how through trial and error based pragmatic experience. On one hand, farmers are reluctant to adopt new technologies and are accused by foresters of blindly following ancestral practices and not attempting to adopt scientific methods of tree planting. On the other hand, there is a lack of sufficient quality planting materials available to farmers, who are equally skeptical about modern methods and innovations suggested by extension agents. This study found a research gap in suitable agroforestry technologies for the reclamation and improvement of soil quality. Seeds of indigenous trees species are locally collected by farmers, but can be ordered through the DoF or National Tree Seed Project. However, because of the varying climatic conditions in Nepal, it is preferable to collect seeds from local sources (Koppelman et al., 1996).

Over the last three decades, community forestry has become a successful model with positive results in forest conservation (Giri and Ojha, 2010). Despite its considerable potential in Nepal, however, local communities have not been able to entirely benefit from this sector. CFUGs have been implementing passive forest management by protecting forests through activities such as removing dead, dying, and fallen trees. This focus by CFUGs indicates that newer technical knowledge on forest regeneration has not been applied in this sector. Studies have also shown that the state of techno-bureaucratic control and regulatory enforcement in Nepal results in barriers to positive changes in behavior, relationships, and technology use for equitable benefits for all (Giri and Ojha, 2010).

7.3.3 Social dimensions of constraints and gaps in knowledge management for CF and AF

The research team attempted to gauge the presence or absence of indigenous knowledge systems through farmers' and women's groups in CFUGs and LFGs in Kathmandu, Lalitpur, Bhaktapur, and Kavrepalanchowk districts. It was apparent that these groups had considerable knowledge of trees, grasses, legumes, and fodder trees in and around their villages in terms of their utility, application, and how specific trees/plants should be planted. However, constraints related to knowledge of local names exist among extension staff and trained professionals. Hence, there is a need for a much more comprehensive illustrated dictionary on uses, locations, common names, scientific names and local indigenous names of species. Various ethnobotanical surveys and studies exist but only in the form of "grey" literature. For example, this information can be found in undergraduate papers but not in Ph.D. level papers. Therefore not too many reliable publications exist.

7.3.4 Barriers and constraints related to market linkages for forest-based products

The biggest challenges in the CF and AF sectors relate to inadequate markets, banking, and government financial support for local farmers. Moreover, agroforestry has never been given high priority in the country's agricultural and forestry development plans (Neupane et al., 2000).

Gaps and regulatory hurdles are also prevalent in this sector regarding enabling laws and regulations and information dissemination and regular availability of market prices and seedlings. The rugged topography and difficult geographical conditions are a major constraint to strengthening market linkages. Lack of road transport, communications, connectivity, and basic manufacturing and energy infrastructure, and distance of production centers from the highway have been major hurdles in linking farmers to markets, resulting in a lag in terms of active forest and technical management. A study conducted by Giri and Ojha (2010) showed that the technocratic, conservation-oriented mindset and behaviors of state officials are a key hindrance to innovation in creating market linkages in the CF sector. There is thus a need to revise regulations and create more open market systems to promote market development, innovation, value addition, and basic manufacturing in the forestry sector.

Discussions with various banks, private sector enterprises such as *Dabur*, and cooperatives promoted by NAF and other consumer and producer cooperatives, including agricultural cooperatives, revealed the vast potential of this sector. It can be expanded and linked to markets in Nepal, India, and China, as

well as further afield such as East Asia, Europe, and USA. Products such as cardamom, tea, coffee, olives, and aloe vera are finding steady markets abroad. There are also good domestic markets for floriculture and horticulture. However, it is essential to allow farmers to sell their products to effectively promote integration of NTFP species. An improved legal framework is necessary to enable the sale of all kinds of locally available NTFPs. An alternative method of enhancing livelihoods could be to encourage the promotion of forest-related enterprises through group marketing systems involving the poorest of poor households (Pandit and Kumar, 2010).

7.3.5 Barriers and constraints related to the knowledge gap regarding value chains and addition in the community forestry and agroforestry sectors

There is very little value addition to raw forest materials of all kinds—timber, fiber, NTFPs, or MAPs. For farmers to adopt newer technologies and management practices, products and community services should be need-based. It is common practice for Nepalese farmers to sell NTFPs in their raw and unprocessed forms to roadhead traders, who then sell these to wholesale or national traders. Farmers could earn more if they are enabled to sell directly to city-based wholesale traders. They could even establish enterprises through value addition (Pandit and Kumar, 2010). However, local farmers lack financial resources and technical knowledge to develop entrepreneurship in this sector. Therefore, the government along with banks and financial institutions should create an enabling environment for obtaining returns on investments.

There is also a knowledge gap regarding the actual needs of communities and a lack of a widely accepted set of indicators to identify farmers' grassroots knowledge. Forestry institutions such as (IoF-Pokhara) follow curricula covering environment and forest management. However, students are not fully trained and aware about the potential of entrepreneurship in this sector. There was a felt need for the introduction of courses on enterprise development, entrepreneurship and value chain analysis to help promote markets for forest products.

7.3.6 Constraints and barriers related to knowledge of business/financial promotion of forest-based products and services in the CF and AF sector

The fuel driving any business in whatever sector is financial capital. One DoF source stated that key commercial and development banks in Nepal are reluctant to invest in this sector because of their desire for immediate returns. By contrast, investments in AF and CF can only yield long-term gains. Hence, a major constraint for business development related to AF and CF is inaccessibility of financial capital and a lack of interest by financial institutions in investing in this sector.

Even in cases where local communities wish to establish enterprises, they are strongly discouraged from doing so by state forest officials who fear deforestation. In the case of established enterprises, they are not provided with adequate and timely advice, counseling, or networking for sustaining these enterprises. This kind of adversarial relationship and behavior has thus discouraged CFUGs despite their willingness and motivation (Giri and Ojha, 2010).

However, other government sectors were reported to be open to the idea of promoting business and finances in this sector, notably cooperatives and some of the commercial and even central banks. These institutions could provide finance for value addition as well as small business enterprises for CF and AF products. In Bhaktapur, the promotion of medicinal plants and herbal products, and of ecotourism and lodges within community forests in the district, were felt to have considerable scope.

Rastra Bank, commercial and development banks, as well as financial institutions appeared to have undertaken a number of initiatives on their own. A number of financial services non-governmental organizations (FINGOs) are already partnering with CF and AF user groups in these joint ventures. Dhankuta was cited as one such example. The only missing links were perhaps second or third generation capacities regarding technical competence and know-how for adding value to raw materials and transforming CF and AF products into viable marketable products that can reach people in urban centers through markets.

7.4 Conclusions

This study attempted to identify and understand existing constraints and knowledge gaps in relation to livelihood enhancing opportunities and food security from AF and CF systems in Nepal's Middle Hills. Identification of these constraints and gaps could facilitate opportunities for interventions to further improve the benefits that the poorest people obtain from forests. This study was designed using an analytic framework that included government regulatory policies and practices, technical aspects/access to germplasm, social aspects, market linkages, value addition, and business and finance. Based on this conceptual framework, the following broad constraints to promoting community livelihoods through AF and CF systems were found to be present in Nepal.

Although households, especially poor ones, have a close relationship to natural resources within their environment, they experience a number of constraints that prevent them from improving their living standards and quality of life. A major barrier appears to be the rules and regulations governing access to forest resources and their optimum utilization, whether as raw, processed, or semi-processed products. Policies, regulations, and officials and institutions in the forestry sector appear to be major impediments rather than enablers in this regard.

Second, a system for connecting institutions to share knowledge and expertise for developing AF/CF systems and take them to a level whereby the grassroots poor can optimally benefit is lacking. Government regulations and policies, therefore, need to be extended and revised so that grassroots UGs are able to fully benefit to enhance their livelihoods through income generation and hence their living standards. Private and public collaborations and the provision of subsidies and loans to UGs by commercial and central banks to create market accessibility for these groups would support them in this regard. Nationwide awareness campaigns involving all the relevant stakeholders, particularly the DoF, should be implemented based on accountability and good governance.

7.5 Recommendations

7.5.1 Government regulatory policies and practices

- Establishment of regulatory policies and practices to create a network involving forestry institutes such as IoF, government organizations, notably NAF, DoF, and DoPR, and INGOs/NGOs working in the forestry and environment. This kind of interlinking should be aimed at long-term harmonization of all involved institutions for knowledge-sharing and improving Nepal's forestry system. Such a network can also be linked to federations of user groups, notably FECOFUN.
- Policies and procedures should be made known to the targeted audience. Any rules/regulations or policies are clearly worthless until and unless they achieve the development of the rural poor. The Government with the support of other relevant stakeholders should invest in awareness campaigns so that UGs are made aware of the policies, rules, and regulations that affect them.
- A statute encompassing all management procedures should be made widely accessible. A good governance management manual can be developed and its implementation made mandatory for staff of public institutions such as DoF. This can be undertaken to stop ongoing malpractices such as corruption and discriminatory or derogatory behaviors towards farmers and community members by government officials, especially DoF rangers and their staff.

7.5.2 Technical aspects/access relating to germplasm

- UGs have a considerable repository of ancestral indigenous knowledge, but they lack modern scientific knowledge. Likewise, DFOs and rangers have been trained in scientific knowledge, but they lack knowledge of traditional indigenous knowledge systems and practices. The interweaving of these two knowledge systems to synergize and learn from each other within an improved forestry sector would significantly support the goal of positive practical action for enhancing

food security and livelihood opportunities. Introducing a framework for global practices such as the SEE framework to manage natural resources could help to: (a) encourage social as well as spiritual and recreational benefits; (b) enhance economic benefits, including jobs, incomes, and national economic growth; and (c) promote environmental benefits such as more greenery, clean water and air, carbon sequestration, and green energy from biomass and hydroelectricity. There should be a resource center for housing and disseminating technical forestry literature that could ultimately be digitalized for online access.

7.5.3 Market linkages/value addition

- Efforts must be made to create a viable range of products and markets for forest-related products. Private and public institutions such as the FNCCI, commercial banks, and government banks should inject financial, technical, managerial, and skilled human capital into community groups, together with incentives to promote income and employment opportunities.
- Barriers towards the establishment and promotion of forest-related enterprises through value addition by UGs should be eliminated to whatever extent is feasible. Constraints and cumbersome barriers posed by government authorities or institutions in terms of tariffs, trade barriers, and regulatory hurdles should also be eliminated, and instead fair trade should be encouraged along with sustainable forest management by CFUGs and private farmers in the Middle Hills of Nepal.

CHAPTER EIGHT: RESEARCH PROBLEMS, DIRECTIONS, AND EXPECTED IMPACTS

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8.1 Introduction and project objectives

This chapter describes the research process, problems, approaches, and expected impacts that emerged through a scoping study to conceptualize future research and identify themes for the background review studies presented in previous chapters, and through a subsequent workshop.

A brief recapitulation of the overall objectives of this research project led by ACIAR is provided below:

- To synthesize the context of Middle Hills' farming systems as well as the contributions and prospects of the national community forestry program and agroforestry systems;
- To assess the scope for improving agroforestry and community forestry for enhancing food security and livelihoods;
- To engage stakeholders to establish priorities for future research.

Key workshop objectives:

The objectives of the project planning workshop were as follows:

- To present the results of the five background research reviews analyzing the relevant context for enhancing livelihoods and food security from agroforestry and community forestry systems in Nepal.
- To share views on key issues identified in the background research reviews.
- To identify key research questions to be addressed for future research aimed at enhancing livelihoods and food security from agroforestry and community forestry systems in Nepal.
- To identify potential sites for addressing the research questions.
- To compile a list of relevant organizations in Nepal and ascertain their capacities to address the research questions and identify local capacity gaps.

8.2 Major workshop outputs

8.2.1 Key research themes and questions

There was a large measure of consistency between the three working groups formed in identifying key research themes and specific research questions. The questions tended to fall into five main themes: (i) land use, (ii) market, (iii) institutional and governance, (iv) access, tenure, and equity and (v) the policy and regulatory framework. Much of the discussion centered on methods of formulating questions, and there was recognition of the importance of “how” and “why” questions as well as “what” questions.

At the end of the second day, a small core group of 15 people met to consolidate the key research questions proposed by the three small groups and to produce a single list under five research themes. Similarly, during the first session of the third day, the list of research questions was further refined by removing duplicates and combining similar topics into one question. The final result is shown in Box 4.

Box 4: Consolidated and refined research questions

1. Land-use

- How can interactions between forest, livestock and agriculture in different localities be effectively managed for increased incomes of tree- and forest dependent-communities, especially the poor and women?
- What are the existing land-use practices and patterns/trends of changes in AF and CF in the Middle Hills?
- What are the drivers affecting the expansion of fallow land, and how could this land be better utilized?
- Why and how are CF and AF not generating sufficient production/income?
- What are the key drivers of change (land use, production systems) through migration, feminization, and land abandonment?
- How can agrobiodiversity and germplasm be effectively conserved to maximize production function?
- What agroforestry and community forestry models could contribute to increased adaptive capacity/ improved productivity of forests/farming communities in the changing context?

2. Market

- What are the drivers that enable or constrain entrepreneurship and enterprise development, and employment opportunities to improve incomes of tree- and forest-dependent communities?
- What are the current status, constraints, and opportunities of markets for agricultural and forest products?
- How can the private sector be engaged in the overall value chain for forestry and agroforestry products?
- How do tax, trade, and other market-based mechanisms (PES) influence/ enhance production and profitability of different tree-based systems?
- How can farmers' groups be developed at a larger scale to manage value chains and other factors?

3. Institutional and governance

- Why have various AF/CF institutions at different levels not been able to enhance livelihoods and food security as desired? How can such institutions be reoriented to more effectively catalyze livelihoods and food security?
- What institutional issues constrain implementation of policies related to forestry and agroforestry? How can these constraints be addressed?
- What could be an appropriate institutional framework that is enhanced for AF/CF?
- How can the capacities of AF/ CF institutions be improved?

4. Access, tenure, equity

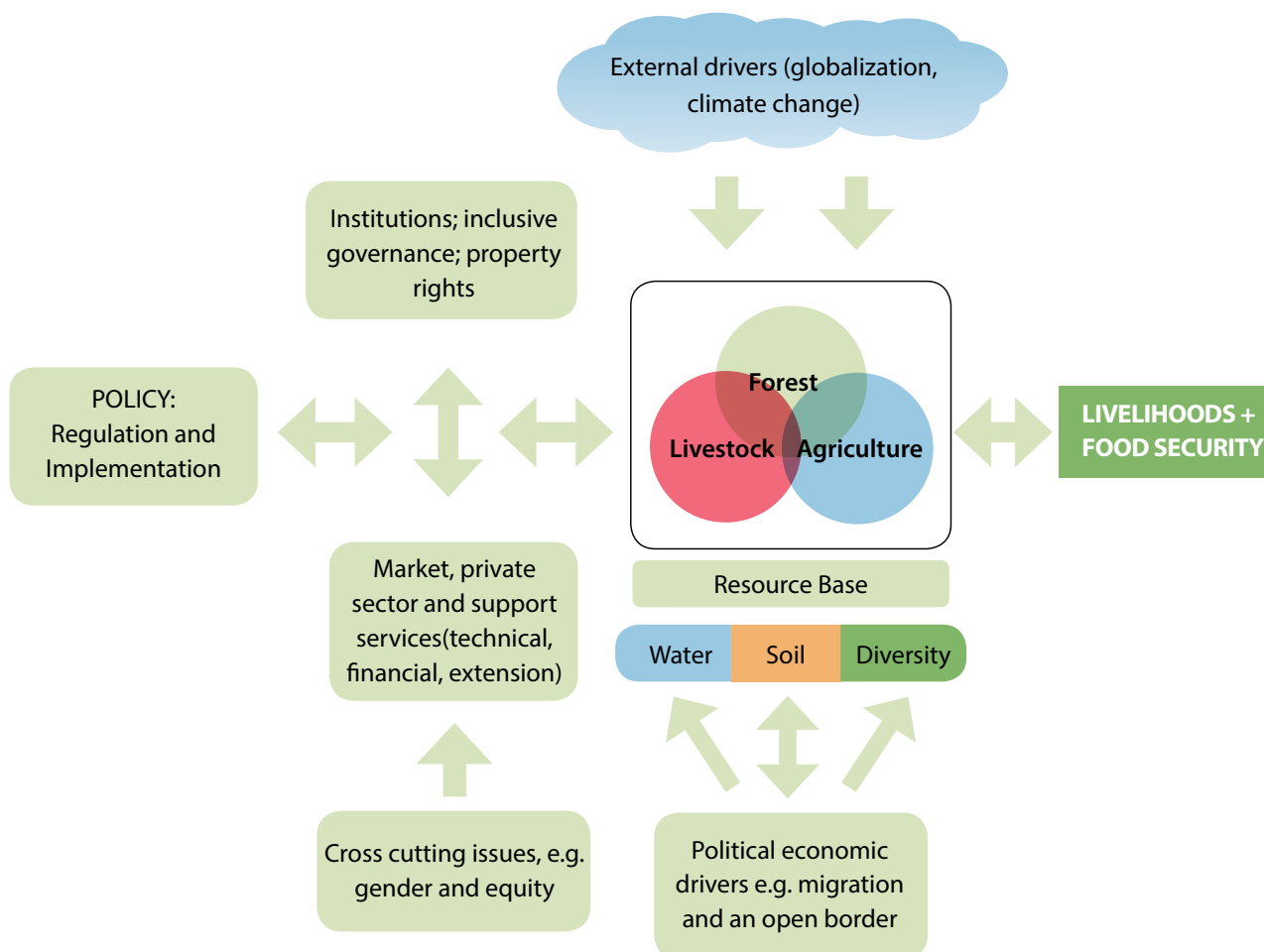
- What tenurial arrangements exist for land, trees, and crops to enable/facilitate the landless, women, and poor people's access to forestry products?
- How has differential resource access affected equitable outcomes at local community-managed forests levels? (i.e. land-poor benefitting from CF?) How can this be improved?
- How has land tenure affected land-use and land-use change in the context of socioeconomic change?

5. Policy and regulatory framework

- What constrains implementation of policies and the legal framework related to forestry and agroforestry? How can these constraints be addressed?
- How can the regulatory framework for CF/AF be improved?

8.2.2 Analytical framework for the research

The small group discussions aimed at identifying key research questions led to a realization among participants of the importance of an analytical framework to connect the research questions (what needs to be done) with methods (how the research is to be carried out). It was recognized that agroforestry systems and community forests are embedded within a wider sociopolitical landscape. If livelihoods are to be enhanced by improving the biophysical assets, this wider context also needs to be considered. All of the groups designed an analytical framework, one of which is shown in the following figure.



8.2.3 Capacity in Nepal to carry out research and capacity gaps

Five small groups were formed during the workshop, each of which considered a representative question related to one of the five research themes and attempted to assess the research capacity in Nepal to carry out research on that question. The representative questions are shown in Box 5 below.

Box 5: One representative question from each research theme for consideration of research capacity in Nepal

1. Land-use

How can interactions between forests, livestock and agriculture in different localities be effectively managed for increased incomes of tree- and forest dependent communities, especially the poor and women?

2. Market

What are the drivers that enable or constrain entrepreneurship and enterprise development, and employment opportunities to improve incomes of tree- and forest-dependent communities?

3. Institutional and policy issues

Why have various AF/CF institutions at different levels not been able to enhance livelihoods and food security as desired? How can such institutions be reoriented to catalyze livelihoods and food security more effectively?

4. Access, tenure, and equity

What tenurial arrangements exist for land, trees and crops to enable/facilitate landless, women, and poor people's access to forestry and agroforestry products?

5. Policy and legal issues

What constrains implementation of policies related to forestry and agroforestry? How can these constraints be addressed?

Identifying organizational capacities in Nepal for carrying out the research:

All five groups found it difficult to identify individual organizations in Nepal with the capacity to address each of the research questions in its totality, partly because in most cases several organizations have partial capacity. Hence it was felt that although there was substantial capacity within some of the NGOs, a collaborative approach involving several organizations would lead to the best outcome. One possibility discussed was to have both primary researchers and secondary researchers. It was noted that most questions required an integrated approach across sectors and disciplines, and there is very little experience in carrying out integrated research and economic research in Nepal. As a result of this combination of factors, it was difficult to identify clear research leaders. Other capacity gaps included:

- Application of action and applied research in general and academic research;
- Critical policy analysis;
- Relating research outcomes in Nepal to a wider international experience;
- Good governance (comparative regulatory tools: what works and what does not: best practices);
- Presentation skills and delivery of research results.

Specific key points:

- Outmigration has impacted on the ways in which private land and community forests are managed, but these impacts (e.g. feminization of the rural workforce) have not been documented.
- There is a dearth of good data on the livelihood benefits of agroforestry and community forestry.
- The major management focus of community forests is still oriented toward conservation and subsistence.

- Community forests have not delivered on their “promise” to improve livelihoods.
- Livestock management is a critical part of farming systems, and fodder production is often a limiting factor.
- Agroforestry practices could be intensified to increase productivity (including increasing high-value cash crops).
- The link between forestry and agriculture is not clear in the contemporary situation. The Wyatt-Smith (1982) study could be revisited in this regard.
- An important question is: how have agricultural practices and productivity changed as a result of increased access to community forestry products?
- The role of community forestry in achieving food security is not clear, particularly in terms of providing a safety net for poor people in food-deficit areas. This may be a resilience issue.
- Active forest management has not taken off in Nepal. This requires “appropriate silviculture” and widespread uptake, particularly in more mature forests.
- Many community forests have reached a stage where some form of enterprise development is needed to deliver economic benefits.
- Major community forestry challenges remain, notably, issues of good governance, social inclusion, and social justice.

8.3 Expected impacts if major research was carried out

The research impacts described here relate to those limited to the small research activity, described in this report, as well as to future sustained research. They are divided into three key areas of current and future impacts in five years: scientific, capacity, and community (economic, social, and environmental) impacts.

8.3.1 Expected scientific impacts of future research

Several significant scientific impacts are expected. These include:

- Generation of biophysical evidence in relation to the productivity and ecological sustainability of selected tree and agricultural crops and livestock enterprises on farms, as well as silvicultural innovations on community forests in the Middle Hills of Nepal.
- Lessons generated on how pro-poor and equitable tenure regimes can be developed in agrarian contexts through a mix of innovative models and strategies involving community networking, inclusive planning, and regulatory provisions.
- Action-verified lessons generated on how forest land can contribute to food security. This would be a novel addition to forest management thinking, globally, to bring the forestry sector closer to the food security agenda.
- Contributions to research, development, and extension strategies to understand and facilitate policy and institutional change in community forestry and agroforestry systems, focusing on how food security and livelihood impacts can be maximized in changing contexts.

- Social and scientific insights into public policy processes around community-based natural resource management, as well as a broader understanding on inclusive policy processes in a highly differentiated and politically transitioning society.

8.3.2 Expected capacity impacts of future research

Research that enhances the knowledge, skills, and benefits of individuals and institutions, particularly those in Nepal, through their participation in trials, action research, and through training elements, is a priority for the future.

8.3.3 Expected community impacts of future research

Future research should translate, more broadly, into significant impacts for communities in key areas: economic, social, and environmental. Anticipated research impacts in each of these key areas are summarized below:

(i) Anticipated economic impacts:

- Improved farming and forest incomes that are crucial for enhancing livelihoods in the Middle Hills of Nepal.
- Optimal transfer of natural resources into financial capital that contributes to the resolution of widespread food security.
- Substantial economic benefits provided to community groups and farming households who directly participate in community forestry research and agroforestry trials. These would include improved production and marketing, and reduced costs through improved service delivery.
- Development of improved production and marketing systems and an enabling environment to facilitate the wider distribution of commercial benefits across the Middle Hills.
- Agroforestry innovations on private lands that more directly influence household livelihoods.
- Conversion of natural capital from community forests into household financial capital through sales of forest products, employment in community forestry, access to fodder for livestock, firewood, and provision of agricultural tools.
- Increased household incomes from improved silviculture and access to trees in community forests.
- Increased adoption of innovations in community forestry and a higher benefit-cost ratio through integration with FECOFUN activities.
- Significant community benefits through more active management of forests, improved marketing and better prices for community forestry and agroforestry products, and improved credit flows.
- Long-term engagement of farmers and communities in more productive agroforestry businesses, enhanced incomes and employment in the rural sector, and also enhancement of the government's tax base.
- Benefits from improved planning/service delivery/monitoring practices at district subdistrict, and regional levels, and from national policy uptake of innovative practices.

(ii) Anticipated social impacts:

- Innovative local institutional arrangements that facilitate disadvantaged groups' access to benefits from community forestry and agroforestry.
- Development of community-based resource management planning systems to address issues of exclusion and inequity amongst people who have been marginalized in Nepal's hierarchical society.



Community discussions on abandoned agriculture land in mid-hills of Nepal; Abandoned agricultural land | by IUCN-Nepal

- Identification of gendered dimensions of injustice, and of opportunities to improve these from the household to the landscape levels with regard to forestry and agriculture.
- Development of innovative strategies and their dissemination so that local communities and land-poor farmers can receive information, services, inputs, and credits in their communal forests and private farms.
- Identification of ways through which public, private, and nongovernmental service providers can effectively plan and respond to the needs and concerns of community groups and farmers involved in community forestry and agroforestry.
- Strengthened community-based institutions that further empower communities to use their forest resources to enhance livelihoods and generate funds for use in community projects such as upgrading schools and health posts, as determined by CFUGs.

(iii) Anticipated environmental impacts:

- Creation of incentives and policy options to encourage farmers to adopt sustainable farming practices on the sloped terrain of Nepal's Middle Hills.
- Development of ecologically sustainable strategies to enhance production.
- Enhancement of the role of forests in agricultural production, resulting in the replenishment of soil nutrients through increased supplies of forest fodder and bedding materials.
- Demonstration of more effective models of tree-crop interactions, encouraging farmers to accommodate increased numbers of trees in their farmland.
- More active management of slow-growing community forests, with increased per unit and per year sequestration of carbon.



Chaubas community forest | by Tony Barlett

CHAPTER NINE: SYNTHESIS AND CONCLUSIONS

Don Gilmour and Racchya Shah

This final chapter briefly synthesizes key themes and findings of the reviews presented in previous chapters. It draws largely on material presented in these chapters, but also elaborates further on some of the main points.

9.1 Policy perspective

Agriculture, food security and community-based management of forests are accorded high priority in all major policies in Nepal. This policy focus is supposed to be translated into action through five-year plans and other similar instruments, although there is some question about how successful this has been. There is a solid policy base for community forestry with the 1989 Forest Sector Master Plan, the subsequent 1993 Forest Act, and the more recent 2000 Forest Sector Policy, with explicit mention of community forests contributing to basic needs and national and local economic growth. The 1989 Master Plan has proved to be a very powerful policy instrument and it has been the corner stone of a paradigm shift in forest management in Nepal.

The high level policy intent of using community forests to improve livelihoods and contribute to economic growth is clear. However, there are numerous aspects of the regulatory framework, and the way it is interpreted by the bureaucracy, that limit the ability of farmers and Community Forest User Groups (CFUGs) to access markets for forest and tree products from both private and community land.

However, agroforestry is not so well served in terms of an explicit policy focus. There is no specific policy, strategy or action plan that focuses explicitly on agroforestry. However, there are sections or provisions for food security in major policy documents such as the Three Year Interim Plan (2010–2012), although there is no mention of how this is to be realized. Agroforestry seems to be an area which is not promoted concertedly as a means of enhancing livelihoods and improving food security. In addition, there is relatively little recent research available on ways in which agroforestry can contribute to livelihoods and food security. To some extent, agroforestry as a policy issue has fallen between the cracks. There is also some ambiguity in terms of the institutional mandate of the MoFSC and the MoAC in taking responsibility for promoting agroforestry.

9.2 The rural economy

Sixty-six percent of Nepal's economically active population derives a livelihood from agriculture which continues to be the single largest employer in the country. The rural economy in the Middle Hills is characterized by low productive subsistence agriculture with limited opportunities for non-farm economic activities. While agriculture is the basis of livelihood for most rural people, they also turn to forests for food, fodder, fuel wood, grazing, and non-timber forest products. This applies particularly to economically marginalized people who cannot obtain all of their livelihood needs from their own land.

The available data suggests that there is considerable food scarcity in the country resulting in severe food insecurity, particularly among the poor. Though the purchasing capacity of a small section of society has increased, the situation with regard to the majority of the poor has deteriorated. Food insecurity among the poor can be attributed to: limited access to productive land, lack of rural non-farm employment, low wages for paid employment, and little access to the remittance economy.

It is widely accepted that there has been a steady decline in agricultural productivity. At the same time, the costs of essential inputs have increased. Farmers have to spend an increasingly large share of their farm income to purchase inputs. Accessibility of quality inputs and their timely availability have become serious concerns leading to negative impacts on production. Agriculture has increasingly become less rewarding and this goes some way toward explaining the increase in abandoned agricultural land, particularly *bari* land, in the rural landscape.

9.3 Social transitions and changing rural landscapes

Rural Nepal is currently undergoing a complex process of transition involving out-migration (and resulting feminization of the agricultural workforce), urbanization, and commercialization and monetization of the local economy. At the same time, significant shifts are taking place from traditional, informal local institutions to modern, formal, and bureaucratic institutions, often bringing state and market actors into the realm of local governance.

There are both internal and external drivers of these changes. The internal ones are population growth, decreasing access to productive natural resources, low returns on labor and other investments, and increasing demand for cash to pay for health, education, and other social services. External drivers appear to be even more influential. The remittance economy associated with out-migration of economically active labor, mainly male, to seek urban and overseas employment has become the most powerful force transforming rural life and livelihoods.¹³ The inflow of cash comes directly to the household, and a large part of it is spent on food, clothing, and other consumables.¹⁴ Remittances, along with infrastructure, and associated improved access to markets, have encouraged consumerism and urbanization. Another impact has been changing household relations, with female-headed households becoming increasingly common. This combination of factors has led to the adoption of less intensive farming with fewer crops in the cropping cycle. A concomitant effect has been the abandonment of agricultural land, particularly marginal land. These changes to overall farming systems have important implications for food security.

Changing cultural perceptions of their identity has been a significant contributing factor in the desire of young people, particularly men, to migrate away from their rural base. They no longer view farming as an honorable and worthwhile occupation and construct their identities accordingly. The discourse of men growing up in the hills has encouraged a view of rural villages as being traditional places to be left in the past, and of urban areas to be desired. The ideal model of masculinity is now shaped by contemporary views of consumption and modernity. Traditional farming is not consistent with this view and has much less appeal to the modern generation (Sharma, 2011).

13 Across Nepal an average of almost 10% of the male population over 14 years of age is absent abroad and in some districts this figure is more than 40% (Kollmair and Hoermann, 2011). Most rural areas are further depleted of active males by additional migration to urban centres in the country.

14 Almost half of all households in the country receive remittances of one sort or another, and these constitute close to 35% of household incomes (Kollmair and Hoermann, 2011).

While some farmers in peri-urban areas and those located along highway corridors have been able to intensify their agricultural production and have become more commercially oriented, this practice is not widespread. Even in those areas where intensification occurs, not all farmers can afford to move their agricultural systems in this direction. High costs and the non-availability of credit are among the important reasons. In addition, many poor farmers have been gradually excluded from farming due to high costs. As a result, many have opted to migrate.

One of the significant and obvious changes in the rural landscape over the past 30 years is the substantial increase in the number of trees on private land. The more recent abandonment of marginal agricultural land has led to a further increase in tree cover as much of the abandoned land has regenerated to trees. This increase in tree cover has occurred across areas of all caste/ethnic groups and well-being categories, including the extreme poor (Hobley et al., 2012).

9.4 Contributions of community forestry and agroforestry to livelihoods and food security

Nationally, each household has access to an average of 0.7 ha of community forest, but there is a substantial gap between supply and demand for all forest products. The shortfall is particularly acute for extremely poor households (Hobley et al., 2012). Several recent studies (e.g. Hobley et al., 2012) have confirmed that CFUGs have built substantial natural, financial, and social/institutional group capital which has led to a series of household benefits and private capital gains. A large scale survey of CFUGs indicated that the employment generated by CFUG activities resulted in the direct transfer of NPR 850–1,280 per household. In addition, CFUGs have been able to accumulate substantial funds (an average of NPR 366,000 per CFUG for forests greater than 100 ha in area). A significant proportion of this money is spent on community development, which has the potential to impact positively on the livelihoods of group members.

There has been some relatively small scale development of markets for agroforestry products, but agroforestry systems are managed primarily to satisfy subsistence needs. This also applies to some extent to community forestry. The evidence for widespread improvement in private capital associated with adopting agroforestry practices is not clear, and is documented mainly with reference to individual or small group case studies. Nonetheless, there is evidence that households can improve their livelihoods by embracing agroforestry. Local markets for some agroforestry products, other than staple foods, have increased substantially in recent years, and there is also a growing international market. The increased purchasing power of urban dwellers has led to an increasing demand for agroforestry products (fruits, nuts, spices and other high value products).

9.5 Key actors

One of the major societal changes to have taken place in Nepal since 1990 is the emergence and maturing of civil society organizations, particularly national NGOs. These have increased greatly in number and capacity, and many now play a pivotal role in providing some of the checks and balances needed in a democratic governance system. They also contribute substantially to the research and analytical needs of development activities, something that was previously done by external researchers, donor-funded projects and consultants. Some of the civil society organizations, such as FECOFUN, have comprehensive networks at national, regional, and local levels that provide an effective conduit for technical or advocacy purposes.

9.6 Conclusions

It is evident that the Middle Hills of Nepal are undergoing a major transformation, caused by multiple factors, and this is having a significant impact on: the nature of family and community social dynamics, farming systems, and the overall landscape. These changes create challenges, but also provide opportunities for agroforestry and community forestry to play a greater role than previously in contributing to improved livelihoods and food security. Many of the factors that inhibit this from occurring are researchable, and many suggestions were made in the reviews presented in this report. These suggestions can be grouped into several categories.

9.6.1 State of knowledge

A recent reviewer of two long running community forestry projects in Nepal noted that the major emphasis of the past decade or so has been on redressing social exclusion and poverty reducing aspects. He questioned whether this focus had been too dominant as it had diverted attention from equally important discussions concerning the resource itself, and how it can be best managed to deliver a range of livelihood benefits (Campbell, 2012).

There is a relative abundance of case study material and country-wide reviews of the contribution made by community forestry to livelihoods, but there is no comparable body of knowledge on the role played by agroforestry. A great deal of work was done on agroforestry in the 1970s and 1980s, but the topic has moved into the margins of research and development interest since then. There is anecdotal evidence, supported by some studies, of the existence of indigenous agroforestry systems, but these are largely unrecognized and undervalued.

9.6.2 Regulatory environment

There are many elements of the regulatory regime that inhibit the ability of farmers and CFUGs from increasing the benefits they receive from managing their tree and forest resources, including NTFPs. For example, the fear of legal issues associated with registration of private trees and NTFPs acts as a disincentive to farmers from adopting or expanding agroforestry, and particularly from managing their systems to produce marketable products. Ambiguities exist over tenure rights of tenants in relation to the utilization of trees and tree products on the land they farm, particularly where the land is owned by absentee landlords who have out-migrated. This demotivates them from investing in long-term agroforestry systems.

There are also significant impediments in the way of individual farmers and CFUGs who want to move from managing their trees and forests largely for subsistence to managing them for both subsistence and commercial products. In spite of the obvious benefits of commercializing tree and forest products to local and national economies, issues surrounding commercialization have been kept in the margins of policy discourse, particularly for timber. To a large extent this topic has never become a priority and has received only limited investments from both governments and donors.

CFUGs face significant regulatory hurdles in many aspects of their operations. In particular, the requirement for complex operational plans and their regular revision, and the necessity for technical inventory procedures, impose heavy operational burdens and financial costs.

9.6.3 Technical issues

There is a lack of knowledge about the most appropriate ways to manage the large areas of recently abandoned agricultural land so that they can contribute to the overall productivity of the farming systems.

Many community forests, that were handed over to CFUGs in the 1990s, are now reaching a stage where a more active form of forest management is possible to optimize the mix of products that is produced; in



Discussions with CFUG leader near Methinkot Kabhre district | by Tony Barlett

particular, products that can find a place in the market. This includes timber. A major emphasis was given to active forest management (notably, appropriate silvicultural systems) in the 1990s, but this emphasis seems to have waned. Many of the maturing community forests, particularly plantations, are now being poorly managed (for example, high grading¹⁵ appears common) and some are degrading rather than improving in quality and hence, economic value. In addition, technical skills for basic processing of both timber and non-timber products, as well as for value adding are not readily available, particularly in remote rural areas.

9.6.4 Governance issues

In general, weak governance often leads to a lack of transparency along the value chain with many opportunities for rent seeking and corruption. This constrains the ability of individual farmers and CFUGs to operate effectively, even when market-linked enterprises are established. Dipak et al. (2011: p. 6) noted that: “...where the flow of money is high” allegations of corruption involving politicians, bureaucrats, and some elite community leaders are widespread. These groups have essentially captured the market and timber is seen by many observers as a commodity for the elites.

Resistance by government officials to relinquishing control over forests, even where they are required to do so under the regulatory framework, also inhibits the ability of individual farmers and communities to maximize the benefits from managing their trees and forests. An analysis of case studies across all major ecological zones in the country revealed that even though local rights of access and usage were guaranteed in national policies and laws, “...a latent hesitation exists among government field officers to fully transfer the rights to communities” (Paudel et al., 2008, p. 27).

9.6.5 Market issues

Many community forests and agroforests are located in remote areas that are poorly linked to road networks. As a result, access to markets is a recurrent problem and a major obstacle to adding value. A complicating factor is that most CFUGs and individual farmers generally deal with small quantities of forest products. Breaking into established markets, or creating new markets, are major challenges. Considerable knowledge is needed by farmers and communities to assess market requirements for timber and NTFPs so that they can tailor their products to fit market requirements. Information is also needed on market trends, prices, value chains, etc. This information is generally lacking.

¹⁵ High grading of forests is a practice that refers to harvesting the best quality trees and leaving behind the lesser quality ones. This practice results in a steady degrading of the quality of the forest. This is particularly important if the remaining trees are used to harvest seeds for future planting, as the genetic base will also be degraded. In plantations, this practice is frequently referred to as “thinning from above.”

9.6.6 Socio-political issues

While research has been the focus of this project planning exercise, research should not be promoted just for its own sake, but rather as a way of contributing to public discourse, with a potential to contribute to changes in policy and practice. This in itself is a researchable topic.

9.6.7 Knowledge gaps that require on-going investigation

While many gaps in knowledge were identified and listed in the previous chapters, there is one that was alluded to but not elaborated on by most authors. This relates to farm land throughout the agricultural landscape that has been abandoned because of the social and economic transformation that is taking place. Anecdotally, the area of land in this category is very large, and probably increasing. However, there are few data available on the extent and distribution of abandoned land and how it is responding to abandonment in different ecological regions.

As early as 1990, reports were available indicating that abandonment of *bari* land was widespread in parts of Kabhre Palanchok District (Malla, 1992). It was estimated that in four VDCs, covering the spectrum from those remote from markets to those close to markets, an average of 7.5% of *bari* land in 102 sample households in the VDCs had been abandoned and was regenerating to trees. Without doubt, this area has greatly increased in the intervening 22 years. There is clearly potential for this category of land to be managed more productively, but it would be desirable to have some hard data on key aspects such as: how much land has been abandoned across the Middle Hills, where is it located, and what are landowners' interests in improving its management. This would be useful background context in designing appropriate research aimed at improving its productivity.

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APPENDIX ONE

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This report presents the findings of background review studies conducted as part of a small collaborative research activity aimed at identifying research needs and priorities related to improving agroforestry and community forestry systems to enhance food security and livelihoods of rural people in the Middle Hills of Nepal. Key partner institutions in this endeavor were: the Australian Centre for International Agricultural Research (ACIAR), the World Agroforestry Centre (ICRAF, Southeast Asia); the International Union for Conservation of Nature (IUCN); the International Centre for Integrated Mountain Development (ICIMOD), and several local Nepalese organizations.

Collaborative studies were carried out by partner institutions to explore selected themes identified through a scoping study and focus group discussions, which were subsequently discussed during a project planning workshop held in Kathmandu from June 11 to 13, 2012. They assessed emerging issues in the community forestry and agroforestry sector and provided recommendations for improving livelihoods and food security of the rural poor within ongoing programs and practices. The themes covered included: the policy and regulatory framework and institutional landscape for community forestry and agroforestry; drivers and dynamics of agrarian change; the contribution of community forestry and agroforestry to livelihoods and food security in the Middle Hills; and constraints and gaps in this sector.

