

Status and Trends in Forests and Forestry Development in Nepal: Major Success and Constraints

Digambar Singh Dahal (达浩)¹ 

¹Master's degree program in Forestry Economics and Management in College of Economic and Management, Beijing Forestry University, No. 35, Qinghua East Road, Haidian District, Beijing, 100083, China

Abstract: Forestry is an extensive land use system in Nepal. Forest management has historically dealt primarily with the silviculture and biological management of forest. Forest is a renewable natural resource, which provides a wide range of environmental, socio-economic and cultural benefits and services. To obtain these benefits and services in perpetuity, an effective management strategy integrating both natural and social part of the forest dependent communities is one of the crucial prerequisites. The major issues lie on interaction between social and natural components and their adaptive mechanism. Management of forestland on a commercial scale has never been a successful story although it was started more than 40 years in Nepal. The first National Forest Inventory (NFI) was carried out with the sole intention of commercial harvesting of the forests so that financial returns could be made possible. Realizing that no significant efforts were made towards the introduction of silvicultural practices to improve the status and condition of forests, the Master Plan for the Forestry Sector, 1989 felt the need for scientific forest management in the Terai. On this basis, the new Forest Act 1993 and Forest Regulations 1995 were introduced and emphasized scientific forest management for government.

Keywords: Policy, Forest management, Forest act, History, Community Forestry

1. INTRODUCTION

1.1 Background

Forests, land, water and minerals are the principal natural resources of Nepal. Forestry is an extensive land use system in Nepal. Forests together with shrub land cover 39.6% of the total land area of Nepal (DFRS, 1999). The forest types of Nepal vary from sub-tropical forest to alpine meadows in the high Himal. Nepal's forest is legally categorized into national forests and private forests. The national forest includes government-managed forest, protected forest, community forest, leasehold forest and religious forest. The ownership and control of the national forest lies with the government and that of private forest with the owner of the forest. For community forest and leasehold forest, only usufruct rights are given to the users. There are 35 major forest types and 118 ecosystems in Nepal. The major tree species in terms of growing stocks are *Shorea robusta*, *Quercus spp*, *Terminalia alata*, *Pinus roxburghii*, *Abies spectabilis*, *Rhododendron spp*, *Alnus nepalensis*, *Schima wallichii*, and *Tsuga dumosa*. Nepal is divided into five ecological regions and the Mid-mountain region has the highest percentage of forest coverage (33%) followed by the High mountains, Siwaliks, Terai and High Himal region respectively.

1.2 Country Background

Covering an area of 147,181 square kilometers, Nepal is located in between China and India. The country's altitude ranges from 70 m above sea level in the south to 8848m at the summit of Mount Everest. Nepal experiences a wide range of climates, ranging from sub-tropical in the lowlands to the arctic climate in the high mountains. It harbors a total population of 26.50 million with 1.35% annual growth rate. The 2009 assessment indicates that 95.5% of poor people live in rural areas and the incidence of poverty in rural areas (28.5%) is almost four times higher than that in urban areas (7.6%) (BTI 2012). Nepal is divided into five ecological regions and the Mid-mountain region has the highest percentage of forest coverage (33%) followed by the High mountains and Siwaliks (35%), Tarai (17 %,) and High Himal region (15%) respectively. It is laid from east to west with mean length of 885 km and from south to north and the mean breadth of 193 km. Geographical location of Nepal is 26022' to 30027' latitude and 8004' to 88012' longitude (DoI, 2061).

1.3 Biodiversity

Nepal is rich in biodiversity. From the perspective of species diversity in wild habitats, Nepal occupies 26th position and 11th position on the global and continental scales respectively. Nepal possesses over



Digambar Singh Dahal (Correspondence)



dahaldigambar@gmail.com



+ 8618311371767

2.7 percent of the world's flowering plants, 5 percent of bryophytes, 3 percent of pteridophytes, 9.3 percent of the world's bird species and 4.5 percent of the world's mammal species. About 19.7 percent (28,999 km²) of the total area of the country is under the protected area system to conserve the representative biodiversity and outstanding landscape of the country.

1.4 Status of forest cover

The last National Forest Inventory (NFI) was carried out in the early nineties in Nepal. According to that inventory, forest and shrub together cover about 5.83 million ha, which is 39.6% of the total land area of the country. The rate of forest area decrease was 1.7% per annum during 1978/79 to 1994, whereas the rate of forest and shrub depletion was 0.5% per annum during the same period. Since then an NFI has not been done to update data on forest cover change. However, the recent studies from 20 Terai districts revealed that the rate of forest cover change was at an annual rate of 0.06% during 1990/91 to 2000/2001. Macro level studies and visual interpretations revealed that Nepal's forest coverage and condition is significantly improving due to the Community Forestry (CF) intervention. The diversity and great altitudinal range

is reflected in the classification of forest types in Nepal which include the following:

Tropical forest (below 1000 m); Subtropical broadleaved forest (1000-2000m); Subtropical pine forest (1000-2200 m); Lower temperate broadleaved forest (1700-2700m); Lower temperate mixed broadleaved forest (1700-2200m); Upper temperate broadleaved forest (2200-3000m); Upper temperate mixed broadleaved forest (2500-3500m); Sub-alpine forest (3000-4100m); Alpine scrub (Above 4100m).

Among these forest types the main species are: Sal (*Shorea robusta*), Oak (*Quercus spp.*) Asna (*Terminalia alata*), Chir Pine (*Pinus roxburghii*), *Abies spectabilis*, *Rhododendron spp.* and *Alnus nepalensis*.

1.5 Legal Classification of Forest in Nepal

The GoN has included regulatory enforcement for sustained supply of forest products in the country in its various policies, acts and regulations. In this connection, the first formal policy and administration (then known as Ban Jaanch Adda) was started in 1925 in Nepal (Pokharel, 1998). The recent legal classification of the forests in Nepal is presented in table:

Table 1 Legal classification of forests in Nepal

National class	Definition
National Forest	All forests excluding private forest within the Nepal, whether marked and unmarked with forest boundaries and the terms shall also include waste or uncultivated lands or unregistered lands surrounded by the forest or situated near the adjoining forest as well as paths, ponds, lakes, rivers or streams and riverine lands within the forest.
Government managed forest	A national forest to be managed by Government
Protected Forest	A national forest declared by Government as the protected forest considering it to be of special environmental, scientific or cultural importance.
Community Forest	A national forest handed over to a user group for its development, conservation and utilization for the collective interest.
Leasehold Forest	A national forest handed over to any institution established on the prevailing laws, industry based on forest products or community for the purposes of conservation and development of forest.
Religious Forest	A national forest handed over to any religious body, group or community for its development, conservation and utilization.
Private Forest	A forest planted, nurtured or conserved in any private land owned by an individual pursuant to prevailing law.

Source: HMGN, 1995.

1.6 Growing stock

In terms of growing stocks *Shorea robusta*, *Quercus spp.*, *Terminalia alata*, *Pinus roxburghii*, *Abies spectabilis*, *Rhododendron spp.*, *Alnus nepalensis*, *Schima wallichii*, *Tsuga dumosa* are the major tree species. Based on the last NFI, total stem volume (over bark) of reachable forests is 388 million cubic meters and the total biomass of stems, branches and leaves is 429 million tons (air dry). For the whole country, the projection of total volume and biomass is estimated at 759 million cubic meters and 873 million tons

respectively. The mean stem volume (over bark) of Nepal is 178 cubic meter/ha, the mean stem volume up to 10 cm top is 131 cubic meters/ha and the average number of stems per hectare is 408 (FAO, 2004).

1.7 State of management of forests

National forest and private forest are the broad categories of forest on the basis of land ownership. But no data are available about the extent of private forest. On the basis of management objectives and management rights, Government forests have been further categorized under Government-managed

forest, community forest, leasehold forest, religious forest, protected forest and forest under the protected areas systems. Community based forestry is the second largest forest management regime after the government managed forest. In this approach government forests have been handed over to the local communities for their autonomous management and use. More than 20000 community based forest user groups are managing about 28% of the total national forest area (CFD, 2012). This participatory forestry has become a successful model for forming the capital (natural, human, financial and physical) and reforming forest governance.

2. THE OBJECTIVES AND SCOPE OF THE STUDY

The aims of this study were to determine the current status, development and key issues of the forestry sector of Nepal, which has major impact in forest and forestry of Nepal.

3. METHODS AND LITERATURE REVIEWSE

For this study the data were obtained from the research literature, Official records etc. The articles were taken from the revised journals in Science Direct database (www.sciencedirect.com), Official website and Google (www.google.com). The articles were selected by first typing appropriate words and then revising the abstracts of the exposed journal articles. A few articles were originated by surveying the reference lists of the proper articles.

3.1 Historical Evolution of Forest Management in Nepal

The approach to the practice of forest management underwent a steady evolution in Nepal during the last century. Various forest policies were formulated and legislative arrangements were made to solve the perceived problems. Based on these major policy changes, the history of forest management in Nepal can be broadly divided into the following periods:

Before 1957:

Before a Shah King of Gorkha unified Nepal in 1769, the area was divided into a number of smaller kingdoms. As the population was small and the resources were abundant, the successive rulers of these early periods felt little need to regulate forest use, and therefore showed little interest in promoting sustainable forest management. The government encouraged individuals to convert forestland to agriculture to increase food production and to increase state revenue through land tax collection (Wallace

1981; Mahat et al. 1986). The earlier policy of encouraging individuals to convert forestland to agriculture was continued during the hereditary dynasty of the Ranas (1846 – 1950). In the mountains and hills, talukdars (village headmen appointed by the Ranas) had the responsibility of regulating forest use, but there was hardly any restriction on forest product extraction for subsistence (Mathema et al. 1999).

The extensive *terai*¹ forests were little disturbed until the late 1920s, when the government initiated expansion of cultivated areas by clearing some forests and extracting timber in other forests for export to India to collect revenue (Joshi 1993). The government hired an experienced British forester (J.V. Collier) who had a long working experience in India for 1925–1930 to supervise and improve timber felling in the *terai*. Collier produced a report in 1928, which suggested extensive clearing of the *terai* forests for conversion to agriculture and settlements (Graner 1997). Many forestlands were also given as *birtas*² to the members of the Rana family and as *jagir*³ to influential officials. According to one estimate, almost one-third of the total forests and cultivated lands were under *birta* tenure by 1950, 75% of that belonged to the Rana family (Joshi 1993).

A popular movement in 1950 overthrew the Rana government. The democratic government succeeding the Ranas prepared a draft policy on rural forestry in 1952–53 with the help of a Food and Agriculture Organization expert (E. Robbe). The policy pointed to two important problems requiring immediate attention, namely the problems of reforestation in the hills and soil conservation in the siwaliks⁴ (Graner 1997). The draft policy, however, was not enacted and the practice of converting forestland into farmland and export of timber from the *terai* continued even after 1950.

From 1957 to 1976:

The government nationalized all the forests in 1957 through the Private Forests (Nationalization) Act. According to Regmi (1978), the intention behind the nationalization was to prevent the destruction of forests and to ensure adequate protection, maintenance, and utilization of privately owned forests. The Forest Act of 1957 led to tremendous controversy and ignited debates regarding its role in deforestation. Many argued that nationalization destroyed the indigenous forest management systems depriving the local people of their right to manage and

¹ Region of northern India and southern Nepal. It runs parallel to the lower ranges of the Himalayas and stretches from the Yamuna River to the Brahmaputra River.

² Land granted to individuals for special services. The system of granting *birta* was increasingly abused during the Rana period when members of the extended ruling family started issuing *birtas* favourably within their family and close relatives (Regmi, 1978).

³ Land assigned to government employees and functionaries for collecting and using share of produce accruing to the state in lieu of or in addition to cash remuneration. *Jagir* assignments were usually granted for the lifetime (Regmi, 1978).

⁴ Siwaliks are a narrow strip of fragile hills extending east-west in between the middle hills and the *terai*. Siwaliks are also known as the *churia*.

benefit from the forests and as a result forests effectively became open access resources (e.g. Hopley 1985; Messerschmidt 1993). However, Gilmour and Fisher (1991) argue that new institutions arose even after the 1957 Act was passed thus rejecting the open access claim. Still others argued that the nationalization was deemed necessary to prevent the deposed Rana rulers from continuing to use the terai forests as their own property (e.g. Joshi 1993). Although a separate ministry, the Ministry of Forestry, was established in 1959 and the government bureaucracy had expanded, the government was unable to control the widespread deforestation that was occurring in vast inaccessible areas. According to Joshi (1993), this was because the government was not prepared to assume the management responsibilities of newly formalized forest ownership after the nationalization.

Following the replacement of the democratic government by a party-less panchayat⁵ system in 1961, a comprehensive forestry legislation – The Forest Act of 1961 – was promulgated. The Act, among other things, (i) divided forests into different categories, (ii) defined the duties and authority of the forest department, (iii) listed offences and (iv) prescribed penalties. In an attempt to further strengthen the role of the forest department in controlling deforestation, the Forest Protection (Special Provision) Act was formulated in 1967. The Act made provisions for stronger penalties for damaging or removing forest products from national forests without official permission. These Acts, however, were still unable to produce the desired results, mainly due to poor enforcement (Wallace 1981). Moreover, none of the Acts dealt with sustainable management, future planning and the needs of the people, but was only concerned with the sale of forest products, prohibition, punishment and organisational changes. In 1962, working plans were prepared for some terai districts but they were never implemented. The role of the forestry staff during this period was limited to forest protection through policing, and local people were considered offenders (Joshi 1993).

Pressure on the terai forestland was also accelerated due to migration into the region and the government's resettlement programs. The eradication of malaria in the terai during the 1950s and the 1960s encouraged a massive migration of people from the mountains and hills to the terai in search of fertile agricultural lands. Moreover, a total of 103,968 ha of forest in the siwaliks and the terai were cleared under settlement

programs beginning in the 1950s (to the mid 1980s; HMG/ADB/FINIDA 1988). An additional 100,000 ha were illegally encroached during the same period (Joshi 1993). Although the stated objective of the resettlement program was to control forest encroachment and destruction by settling families in designated areas, in practice the policy indirectly encouraged illegal encroachment of forests for cultivation.

People encroached forestlands with the hope of getting it registered as private property once the land was cleared and cultivated (Wallace 1981).

From 1976 to 1988:

Following the recommendations of the Ninth Forestry Conference held in Kathmandu in 1974, the government drafted a national forestry plan in 1976. For the first time the Plan recognised the role of local communities and specifically emphasised their participation in forest management (Pokharel 1997). To implement the concept laid down in the Plan, the Forest Act of 1961 was amended in 1977 to define new categories of forests to be managed by local communities, religious institutions and individuals. Operating rules for the Panchayat Forest (PF) and the Panchayat Protected Forest (PPF) were prepared in 1978, which allowed village panchayats to manage barren or degraded lands for forest production. A further provision of leasehold forestry was made in the Rules, allowing a limited area of degraded forestland to be given to individuals or agencies for reforestation and production of forest products (Wallace 1981). These amendments in the Forest Act and Regulations have been taken as evidence of the government's realization that forests cannot be managed without the cooperation of local communities and hence represent a major shift in Nepal's forest policy (Shrestha 1996). However, the success of the partnership between the Forest Department and the panchayats was very low due to various reasons (see Pokharel 1997).

During the initial stage of participatory policy creation, the emphasis of the government and donor agencies was on resource creation through reforestation and afforestation projects. People's involvement in forest management was limited to activities directly related to the government project objectives (Collett et al. 1996). Part of the reason for this emphasis was the strong international influence originating from the perception of an imminent ecological crisis in the Himalayas (see Eckholm 1975), which prompted donor agencies, particularly

⁵ A village panchayat was the lowest politico-administrative unit during the party-less panchayat system of government. It has been renamed as Village Development Committee (VDC) after the restoration of democracy in the country in 1990.

the World Bank, to recommend large scale plantations to address the perceived problem.

1988 onwards:

The 25-year Master Plan for the Forestry Sector (HMGN/ ADB/FINIDA 1988) was prepared during 1986–88 and was approved by the government in 1989. The Plan recognized community and private forestry as the largest among the six primary forestry programs and encouraged the transfer of forest access and management rights (i.e. tenure) to local communities. The Master Plan emphasized the need to establish FUGs as the appropriate local management bodies responsible for the protection, development, and sustainable utilisation of local forests. The Plan also made the development of an operational forest management plan by communities a prerequisite to handing over forests for their use. It also emphasized the need for retraining the entire forestry staff for their new roles as advisors and extension workers. The Plan recommended handing over all accessible forests in the hills to local communities to the extent that they were willing and able to manage them (Bartlett 1992). The formulation and implementation of the Master Plan can thus be considered a turning point in the history of forestry sector policy in Nepal.

A new forestry legislation (HMGN 1993, 1995) was promulgated and enforced in 1995 for improved implementation of the Master Plan. The Forest Act of 1993 categorized national forests into five sub-categories, namely community forest, leasehold forest, government-managed forest, religious forest, and protected forest. Community forestry was given the highest priority over other types of forest management. A community forest is the forest collectively managed by local villagers who have organized themselves into a FUG according to negotiated and approved management agreements with a local district forest office. The Act identified a community FUG as a self-governed autonomous entity with authority to independently manage and use the forest according to an agreed management plan. An amendment to the Act in 1999, however, made it mandatory for a FUG to invest at least 25%-35% of its income in the development and conservation of the community forest.

The effect of this policy and legislative changes has been positive. The community forestry program has dramatically expanded in terms of both spatial coverage and number of forests handed over to local communities after the enforcement of the new legislation (i.e. HMGN 1993; 1995). Forest Department records show that at present approximately 1.65 million ha (28% of the total forest area) of forest are handed over to 17685 CFUG's including 1026 women CFUGs benefiting 2.1 million households (about 42% households of Nepal) by the

end of 30-june 2012(CFD, 2012). Most of these community forests were in the middle hills. Many community FUGs have now moved into intensive forest management for the purpose of producing surplus for sales (JTRCF 2000).

The evidence from limited past studies, however, shows that there are wide variations in the success of community based forest management programs across the country. For example, the community forestry program has been far less successful in the terai when compared with the middle hills (JTRCF 2000). This is in terms of number of FUGs organized for forest management as well as spatial coverage of community forests. The most recent FUG database record (9 December 2003) of the forest department shows that only 4.4% of the total registered FUGs in the country are in the terai (including inner-terai, and churia) managing 6.3% of the total community forestlands. This was despite the fact that more than 48% of the country's population lives in this region and the region includes 31.5% of the total forested lands.

Several factors might have contributed to the lower success of the community forestry program in the terai. The conservative approach adopted by the forest department in the handing over of forests to the local communities has been believed to be one of the most important factors. Unlike the hills and mountains, it seems that the forest department is not willing to relinquish its authority from the terai forests to the local communities. Various forms of anomalies and misconduct by community FUGs, the socio-economic context of the terai (greater ethnic heterogeneity, better accessibility, high migration into the region, and better access to markets) and characteristics of the forest resource (high value) have often been presented by researchers as the major underlying factors responsible for both government skepticism in handing over forests to local communities and mismanagement by FUGs (e.g. Baral and Subedi 2000; Chakraborty 2001).

3.2 Institution working in Forestry Sectors

Government organizations

Since it was first established as Ban Janch Adda (forest inspection office) around 1880, the forestry administration in Nepal has undergone a series of fundamental changes and has been substantially expanded over the years. The Kathmahal (timber office) was established in 1927 with the purpose of supplying railway sleepers to India. The Department of Forest (DoF) was established in 1942 with a primary objective of carrying out forest exploitation under a series of working plans, following the format originally established in British India (Hobley 1996). Initially, the department had three regional and 12 divisional forest offices under it as recommended by a

British forestry advisor E.A. Smithies, who spend several years with the Indian Forest Service.

There have been considerable changes in the organisational structure of the DoF since its establishment. Significant among those were the changes of 1976, 1983, 1988, and 1993 (see DoF 1994). The department now has 74 district forest offices, 92 ilaka (sub-district) forest offices and 698 range posts under it. Along with the structural changes, there have been substantial changes in the number of employees working for the DoF. For example, in 1961 there were about 2,000 staff; this figure increased to around 6,000 by 1987, and over 7,000 in 1995 (Pokharel 1997). Historically, the main role of the district forestry staff was to protect forests through policing. In recent years, particularly after the government adopted community forestry as its main forestry strategy, there has been a gradual shift in their role from policing towards facilitation and extension.

The Ministry of Forest and Soil Conservation (MFSC), in coordination with the National Planning Commission, is responsible for formulating forest policies and administering the country's forest resources. Since its establishment in 1959 as the Ministry of Forestry, the Ministry has undergone several structural changes. The present organizational structure of the Ministry consists of five divisions under the secretary to look after the functions of planning and human resources, foreign aid, environment, monitoring and evaluation, and administration. In addition, there are five departments, five regional forest offices and three semi-government corporate agencies under the Ministry. The DoF is the largest and oldest organization among the five departments within the MFSC.

The five regional forest directors are responsible for coordinating, planning and monitoring district forestry activities within the region. However, because of insufficient resources and executive authority, the regional forest offices are not capable of functioning as intended (Pokharel 1997). The five regional forest training centers, which are positioned under the DoF and work under the general supervision of the concerned regional director, conduct in service refresher training for the lower-level technicians, organize forest management training for the FUG members, and facilitate networking among FUGs through seminars and workshops. The district forest offices are the carriers of government policy in the field and are responsible for the planning and implementation of district level forestry programs. The districts are divided into three ilaka forest offices and 4 to 15 range posts. Range post and ilaka staffs are often the contact points for the local people and act as the interface between the local people and government bureaucracy.

Some other government departments such as the Department of Soil Conservation and Watershed Management and the Department of Wildlife and National Parks also implement some forestry programs through local user groups or directly by the departments. The Department of Forest Research and Survey is the only government agency that carries out forestry research and is responsible for providing forestry information required by other departments including the Department of Forest.

Despite several changes in the organisational structure and the substantial increase in the number of employees, the success of the government forestry agencies in achieving the objectives of sustainable forest management has been debated over the years. Joshi (1993) argued that contradictory forest policies and frequent changes in legislation were primarily responsible for creating an unstable and counterproductive government forest administration.

Community-based institutions

Community-based management of forest, in the form of traditional or indigenous systems, has a long history in Nepal, particularly in the hills (Arnold and Campbell 1986; Fisher 1989; Gilmour 1990; Messerschmidt 1993). These systems were operational under different types of institutional arrangements at different times and locations. During the period when the Ranas ruled the country, many hill forests were under the responsibility of talukdars. Kipat was another form of land tenure in which land was regarded as the common property of the local ethnic group and was managed from within the ethnic group's organization (Fisher 1989). Some of the rules adopted by these indigenous systems of forest management included, (i) only harvesting selected products and species, (ii) harvesting according to the condition of the product, (iii) limiting the amount of product, and (iv) using social means of monitoring (Arnold and Campbell 1986). Some forms of indigenous systems continue to exist in many places despite a general belief that the nationalization of forests in 1957 destroyed these systems and forests under indigenous management are usually of higher quality compared to other forests in the same area. The continuous survival of indigenous forest management systems in many locations despite the nationalization of forests in 1957 was probably because of informal cooperation between communities and local officials that allowed successful forest conservation practices to continue against the national policy.

The Forest Act 1993 provides following rights to Nepalese citizens who depend on forest and who are willing to be the members of a CFUG: a) right to get organized with perpetual succession, b) entitlement over forest growing stock, c) right to use 100% benefits resulting from the sustainable yields, c)

unalienable citizen rights even if a community forest is withdrawn by the government in case a particular CFUG executive committee does not meet sustainability standards in forest management. These rights have significant incentives and motivated local forest dependent citizens to participate in forest governance.

The FUGs formed under the state-sponsored community forestry program are important local forestry organizations at present. Each FUG is authorized to make rules related to the governance of the community forest and the FUG itself. Rules crafted by the FUGs become operational after receiving approval from the concerned district forest officer. The establishment of FUGs and handing over forests into their care and supervision has vastly improved the level of contact and cooperation between the forest department and the local people in recent years (Collett et al. 1996). Lease groups formed under the leasehold forestry program for the poor are another type community-based forestry organization. Each lease group is composed of a small group (5–10) of local people living below the poverty line who have organized themselves into a group to manage and use degraded forestland handed over to them by the district forest office (Sterk 1998).

At present, CFP is not just a government program offering some services to people; it is owned and actively sustained by citizens – who are organized as Community Forest User Groups (CFUGs). CFP indeed offers a model of direct democracy at the local level regarding forest management. With 16 thousands CFUGs (covering one third of 26 million people) directly participate in the governance of forests throughout the country (DOF, 2008), Nepal's CFP is probably the largest sectoral domain of governance in terms of the number of citizens directly engaged, surpassing even the largest political party in Nepal.

Community forestry started in one village Panchayat in Sindhupalchowk district with the naming of a forest committee by the District Forest Officer (DFO). The forest committee, having been nominated by the DFO was given authority to decide on the use of forest allotments, which were protected or newly planted by its members.

Federation of Community Forest Users in Nepal

The Federation of Community Forest Users in Nepal (FECOFUN) is a non-government organization established in 1995 to complement government initiatives related to the development of community forestry. Over the years, there has been a considerable expansion in the organizational structure as well as the objective of the FECOFUN. It is now working as an advocacy and lobbying organization to protect the rights of community forest users and contribute to the

development of community forestry (Shrestha 2000). The organization has a multi-tiered structure with FUGs organized in Local FECOFUN (VDC level, range post Level), district FECOFUN, and the central FECOFUN. By the end of 20012, all the 75 districts of Nepal have FECOFUN organizations that included more than 12,000 member FUGs. FECOFUN has become an influential player at the national level and is probably the only national federation of forest users in Asia.

Other agencies

Several bilateral and multilateral donor agencies have contributed in the development of the forestry sector in Nepal by providing financial and technical assistance, primarily for the implementation of the community forestry program. The history of such assistance dates back to the early 1970s.

3.3 Forestry sector contribution

Nepal is dominated by an agrarian society. Forestry is an integral part of agriculture and rural livelihoods and fuel wood is the principal source of rural energy. Non-wood forest products (NWFPs) have become the source of income for the rural poor, medicine for primary health care and revenue for the government. Out of the total tourists visiting Nepal about 45% visit protected areas. Although the forestry sector has a significant role in the economic development of the country, no comprehensive study has been done yet on the contribution of the forestry sector to the Gross Domestic Product (GDP). As a result, the contribution of the forestry sector has been underestimated and it has a low policy profile in Nepal. FAO, 2004 has estimated that Nepal's forestry sector contributed 3.5% to the GDP of the country in 2000 and 4.4% for the period 1990 to 2000. But it is estimated that the forestry sector alone contributes 15% to the GDP of the country.

3.4 Problems and issues in Forest Management in Nepal

Main Problems

The lack of financial and human resources is considered as the major constraint for the sustainable production of forest products, which is the main objective of Government of Nepal for managed production forests. There are also policy constraints such as management practices that are oriented to the sustainable production of particular products that may have negative impacts on biodiversity. Likewise, budget allocations for the implementation of Operational Forest Management Plans are meant for silvicultural operations and the harvesting of forest products.

Source: www.cbd.int/doc/world/np/np-nbsap-01-en.pdf

Incomplete baseline information:

There are gaps in the baseline information on flora and fauna diversity including the biology, ecology, conservation status, and geographic and altitudinal distribution of rare and endangered species.

Delays in preparing Operational Forest Management Plans:

In the Mid-hills, while community forestry is spreading at a modest rate, national forests, forests outside PAs, and forests not under community forestry should not be left unprotected from exploitation. Such forests are quite large in area and should be put under management according to Operational Forest Management Plans. Delays in preparing and implementing Operational Forest Management Plans for these forests mean delays in implementing conservation programs.

Time constraints for biodiversity conservation:

In the Mid-hills, District Forest Office staffs' time is spent either on community forestry or in administration, and not enough time is given to biodiversity conservation.

Scattered area:

In the Mid-hills, forests are scattered in small patches of often less than 100 hectares and are surrounded by agricultural land and settlements. Heavy pressures from human and livestock populations in these forests for subsistence needs make biodiversity conservation very difficult. A critical issue is how to involve villagers in the management of the forests of the Terai and Siwalik Hills. Forests that are already handed-over, are in the process of being handed over, or that will be handed over to communities as a community forestry in these regions will have major implications for biodiversity conservation.

Population pressures:

The population density of the Mid-hills is high, and there exists a close linkage between the farming systems and the forests. As such, there is intense human interaction with the vegetation.

Community forests that are handed over to forest user groups vary in size from less than one hectare to over 500 hectares, with most being between 50-100 hectares in size. The average area per household is under 0.7 hectares.

Forest Fire

Every year wildfires destroy considerable forest resources in Nepal. Such destruction includes both timber and non-timber forest products. Although quantitative information is not available, forest fires are definitely degrading biological diversity in Nepal's forests. In addition, fires cause soil erosion and induce floods and landslides due to the destruction of the natural vegetation. Occasionally, embers from forest

fires also cause fires in nearby villages, especially in the Terai region where the roofs are made of thatched grass. Many villages are burned every year with loss of lives, cattle and other property.



Priority in meeting peoples' needs:

Sustainable production of forest products is the main objective of community forests, which may have negative implications for biodiversity conservation. Many user groups allow unrestricted collection of dead wood and leaf litter from their community forest, yet these form important microhabitats for invertebrates, mosses, fungi and lichens, and their continued removal may lead to reduced biodiversity. Similarly, many user groups have included phrases such as "removal of unwanted species" in their forest operational plans, yet these species may be ecologically important and biodiversity may suffer as a result of their removal. Communities have the right to manage their forest and determine management options. Managing a variety of plants and products demand prescriptions and control mechanisms that are acceptable to all members of the users group. User groups prefer options that are simple to follow and apply, and that provide quick and greater benefits to them.



There is often a lack of information with which to prepare sound operational plans, and this lack of socioeconomic as well as biophysical information hinders the development of plans that integrate biodiversity conservation issues.

Training programs available under community forestry initiatives do not cover the importance and potential of biodiversity conservation in community forests.

Deforestation and land degradation

Deforestation and land degradation appear to affect a far greater proportion of the population and have the worst consequences for economic growth and individuals' livelihoods. Forest loss has contributed to floods, soil erosion, and stagnant agricultural output. Estimates suggest that from 1966 to 2000 forest cover declined from 45 to 29 percent of the total land area. Often cited causes of deforestation include population growth, high fuel wood consumption, infrastructure projects, and conversion of forests into grazing- and cropland. According to government estimates, 1.5 million tons of soil nutrients are lost annually, and by 2002 approximately 5 percent of agricultural holdings had been rendered uncultivable as a result of soil erosion and flooding.



Poor management of large blocks of forests in the Mid-hills:

Large blocks of forests in the Mahabharat Range of the Mid-hills and in the mountain regions that cover a number of VDCs within a district and spread over more than one district are not yet managed. The frequency of visits to these areas by DFO staff is low due to their remoteness. There are no programs for the management of these large blocks of forest areas, other than the occasional visit by DFO staff in response to complaints. Extension of community forestry programs in these areas is negligible. The sub-alpine (3,000-4,000m), alpine (4,000-5,000m) and temperate (2000-3,000m) forests rate as first, second and third respectively in numbers of endemic plant species (Shrestha & Joshi 1996). Proportionately, total PA coverage is highest in the mountain regions and lowest in the Mid-hills. Nevertheless, existing large blocks of forests in the Mid-hills have potential to be managed for biodiversity conservation, as they are water catchment areas. Special programs involving local people need to be developed and implemented for the conservation of these forests. The benefits obtained from these forests should then be shared amongst the local people.

Key Issues in the Forestry Sector

Peace and stability are the pre-conditions for development of the country. Forestry sector is one of the major sectors that can contribute to the socio-economic development of the country. However, there are many issues to be tackled in the forestry sector of Nepal so as to attain sustainable development in the forestry sector. Population and poverty are the two main causes of destructive pressure on forests. The depleting forest cover calls for the urgent possible care in planning a strategy to rehabilitate the forests and meet the genuine human needs. Some of the major issues of the forestry sector of Nepal can be explain as follows:

Table 2 Major Issues in the Forestry Sector

Category of the issue	Description
Policy Issue	Country doesn't have long term national land use policy, Handing over government forest are for other purposes
Legal Institutional Issue	Restructuring of the forestry sector
Socio economic issue	Underestimation of forestry sector contribution in national economy, Heavy dependency of poor people on forest resources, Low return on investment from the forest sector
Technical/HRM issue	Limited human resources, Poor and weak forest research activities, poor and weak database system on forest resources.
Environmental Issues	Principle of payment for Environmental Services (PES) is not considered (Biodiversity conservation, Carbon sequestration, Soil and watershed conservation etc.)
Management issue	Unsustainable harvesting and collection of NTFP resources, Conflict in the management of Terai, Churia and Inner Terai forest, Operational Forest Management Plan has not been implemented,

Source: FAO, 2009

4. DISCUSSION

4.1 Status and Trends in Forests and forestry in Nepal

Wood products

The main traded wood products are logs, sawn timber, poles, posts and fuel wood. Wood removal refers to the amount of round wood, sawn timber and wood fuel sold by the Department of Forests (DoF), The Timber Corporation of Nepal (TCN), the Forest Product Development Board (FPDB) and Community Forest User Groups (FUGs). Round wood removal statistics ranges from 24.36 000 cubic meters in 1992/93 to 80.54 000 m³ in 2002/03. Similarly, the figure for fuel wood was 20.79 000 m³ in 2005/06 up from 178.13 m³ in 1992/93. The amount of wood and fuel wood consumed per annum in the country is estimated at 2.2 million m³ and 11,623 million kg. In 2001, the total production of industrial round wood and fuel wood was 0.15 million m³ and 0.95 million m³ respectively. Similarly, the consumption of industrial round wood and fuel wood was 0.1 million m³ and 0.92 million m³ respectively.

Wood fuel

Biomass is the major source of energy in Nepal. Wood fuel alone contributes about 85% of the total energy in the residential sector and the rest comes from other sources of energy. Annual consumption of biomass resources has increased by about 2.4% since the last decade. Consumption of commercial forms of energy is annually increasing by about 10%. On the whole, about 0.48 percent of the total gross energy production in the country is produced from renewable sources. The share of petroleum products is less than 10% of the total energy consumption. Though the country is rich in water resources, only about 1% of the economic potential of hydro power is harnessed so far. The contribution of electricity from the central grid system is around 2%. Industrial and commercial sectors use even less than 1% of their energy consumption derived

from wood fuel resources. The effective price of LPG is quite low. Fuel wood becomes cheapest once it is available free of cost or less than NRs 4 per kilogram.

Impact of climate change

The country has limited information regarding the impacts of climate change on economic growth, development, resource conservation and basic livelihood. The average warming of annual temperature in Nepal was 0.060C during 1977-1994. Warming in high altitudes can lead to glacial melt and retreat. This can alter the rainfall pattern, hydrological cycle and availability of water resources resulting in increased flooding or depletion of water resources. Nepal has experienced weather related extreme events such as excessive rainfall, longer drought periods, landslides and floods. This situation has created problem in irrigation and water supply systems. It is estimated that climate change in the Nepalese context would have negative impacts on agriculture, forestry and biodiversity.

Policies, legislations and institutions

The Master Plan for Forestry Sector (MPFS, 1989), periodic plans, fiscal policies, forest and forestry laws and regulations are the policy guidelines and legal instruments facilitating sustainable forest management (SFM) in Nepal. The Ministry of Forests and Soil Conservation (MFSC) is the apex institution to create an enabling environment for the conservation and sustainable management of forest resources. There are five departments under the Ministry. With the advent of community based forestry, Community Based Forest User Groups (CBFUGs) became effective and powerful institutions for the conservation and management of national forests. At present approximately 1.65 million ha (28% of the total forest area) of forest are handed over to 17685 CFUG's including 1026 women CFUGs benefiting 2.1 million households (about 42% households of Nepal) by the end of 30-june 2012 (CFD, 2012). The role of the

private sector in the forestry sector is only confined to the marketing of forest products and advocacy for better policy formulation.

4.2 Production and Trade

It is difficult to find data on the total production and trade involving exports and imports for Nepal due to the lack of organized data and also due to the existence of illegal internal markets and across the border with

India and China (Tibet). However, in comparison to high-scale timber exporting countries like Malaysia and Indonesia, the commercial wood production and trade in Nepal is smaller. Though data on illegal logging and trade are difficult to get, it is very clear that these activities need to be controlled in time, otherwise this will adversely affect the forestry sector in Nepal. Nepal is a net timber products importing country. Table 4 lists the changes of timber production, consumption, import, and export in 1996 and 2000⁶.

Table 3 Production, Consumption, and Trade of Timber Products in Nepal (in 1996 and 2000, 1000 m³)

Product	Production		Consumption		Import		Export	
	1996	2000	1996	2000	1996	2000	1996	2000
Log (% of tropical species)	1250 (0)	1318 (0)	1253 (0.2)	1321 (0.0)	3 (100)	3 (0)	0 (/)	0 (/)
Sawn (% of tropical species)	620 (0.3)	630 (0.0)	623 (0.8)	633 (0)	3 (100)	3 (0)	0 (/)	0 (/)
Veneer (% of tropical species)	0 (/)	0 (/)	0 (/)	0 (/)	0 (/)	0 (/)	0 (/)	0 (/)
Plywood (% of tropical species)	4 (0)	5 (0)	4 (0)	7 (0)	0 (/)	2 (0)	0 (/)	0 (/)

Source: 2000 Review, ITTO http://www.ittis.org/profiles/profile_ap_ne.htm

According to the data from FAO, the total round wood production in 1996-98 was 20,993 cubic meters, with 20,373 cubic metres of wood fuel and only 620 cubic meters of industrial round wood⁷. The export value of forest products is 1 million US \$ whereas the import value is 1.4 million US \$ with an export import trade deficit of 0.4 million US \$. Wood trade export accounted for only 0.08 percent of the total exports in 1997. The majority of exports go to the Indian markets. Due to the protection of high-value forests in Terai as national forests and protected areas, and the lack of a sufficient strategy for utilizing these forests, the timber trade does not occur in a significant amount. It has been reported that during the fiscal year 1996/97, Timber Corporation of Nepal marketed 882,227 cubic feet of logs, 113,493 cu ft. of sawn timber, and 1,888 chattas of fuel wood⁸. Being a subsistence economy, the majority of the rural population is dependent on forests for fuel wood resource, which is the main energy resource. Therefore, most of the wood market is for fuel wood. The annual rate of use of fuel wood according to 1997/98 data was equivalent to 14.1 million metric tons of fuel wood. Water and Energy Commission Secretariat (WECS-1995) mentions that about 16 percent of the total fuel wood used in Nepal passes through commercial channels i.e. about 2.2

million tons of fuel wood is traded through the markets in Nepal.

Trading of non-timber forest products (NTFPs) - both unprocessed and semi-processed (such as, herbal products, resin etc.) is done from Nepal. NTFPs represent a significant source of revenue for individual households, community groups and national economy (Edwards, 1996). It is estimated that about 65 percent of the total collection is exported to India (Edwards, 1996). The first NTFP trade survey conducted in 1996 by Asia Network for Sustainable Agriculture and Bio-resources (ANSAB) found that approximately 42 thousand tons, consisting of more than 125 different NTFPs were handled by about 100 traders in 1995. This trade amounted to more than \$ 26 million in 1995 (Ojha, 2000).

4.3 Community Forestry Program (CFP); a Successful forestry Community Based Forest Management Practice in Nepal

Status of CF

Community forests are the part of national forest handed over to a local community known as Community Forest User Group (CFUG) for forest

⁶ http://www.ittis.org/profiles/profile_ap_ne.htm

⁷ The same period data for Malaysia for example is: 37,081 cu m (total round wood production), 7,410 cu m (woodfuel) and 29,670 cu m (industrial round wood).

⁸ www.rwedp.org/acrobat/rm51.pdf

development and conservation as well as utilization for collective benefits. GoN (1991) defined CFUG as a community all the members of which regularly use a particular area of forest for grazing and collecting of forest products and form themselves into a group to protect, manage, and utilize that area of forest. A CFUG is legally formed if forest users of a particular location form a group, craft constitution and register it in the District Forest Office.

The Department of Forest (DoF) has been implementing Forest policy in most part of the 75 district of Nepal. Tamang, (2012) has reported, "Currently, there are around 20,000 CFUGs have been registered and some are in ongoing process in Nepal. FECOFUN⁹. Most of CF are in the mid hills but a sizable number of them are in the flat plains of the Terai as well". Nepal is a leading country in institutionalizing the concept of CFM in national forest policy, with about 35% of the total population of the country managing around 1.1m ha or 25% of the national forest (Kanel, 2004). Today about 2.1 million rural households in Nepal are organized into more than 17,685 CFUGs responsible for managing and using 1,652,654 hectares of National Forestlands. These CFUGs are not only managing forest resources but also engaged in community development works such as school buildings, drinking water, and trail improvement from funds generated by community forests through selling forest products. Community forestry has achieved remarkable success in terms of forest recovery and people's participation in forest development and management. However, equitable distribution of the benefits from community forests among the users is challenging (DoF, 2013).

Strengths of community forestry

Community forestry has many positive impacts on socio-economic development of the community in rural areas and in the environmental protection of the hills of Nepal. Some of the important strength of the program can be listed as below:

1. Forest Protection by community members
2. Maintenance of greenery with positive impact on environment and climate change.
3. Legally recognize forest user groups with legal status.
4. Participatory democratic systems within the group.
5. Responsibility bestowed upon the forest user groups for sustainable forest management and biodiversity conservation.
6. Freedom to use forest products independently within the framework of constitution and

operational plan.

7. Provision to use forest user group fund for the forest development, rural development and community development.
 8. Transfer of technology through various means of community management programs and training.
- Self-reliant for low-income community and backward consumer/user, including women through income generating activities.

5. CONCLUSION AND RECOMMENDATION

Forest resources, which cover one-third of the country's area, are an important resource for both local livelihoods as well as national development, as forests in Nepal have been used for timber as well as a number of non-timber products such as food, medicines, inputs to agricultural system, and more recently as commercial traded products. Forests have also been a basis upon which community institutions have evolved over time creating social capital for livelihoods (Ojha, 2002). Now, in Nepal, forestry is regarded as a social issue rather than a technical issue and endorsed as a significant sector of national development and very potential contributor to national movement against poverty (Shrestha, 2000). Despite the forest's dynamic potential, and expansion of community forestry as an approach, the real impact against expectation has always been questioned. Lack of physical infrastructure, economic activities and increasing poverty are some of the issues greatly concerned with Nepalese context of development. Excessive use of natural resources and lack of transparency in renewable resource management has virtually left Nepal's sustainable community forest management in cross road.

Nepal is rich in biological diversity (biodiversity) due to its varied climate and altitudinal ranges within short interval distance. Nepal comprises only about 0.1 percent of the terrestrial area of the earth but it harbors high share of biodiversity. A total of 118 ecosystems with 75 vegetation types and 35 forest types. Nepal's developmental challenges are also reflected in Sustainable Development Agenda for Nepal (SDAN) which has particularly stressed the integration of the concept of sustainable development in all the development processes for balancing population and environment, for achieving high and sustainable economic growth through community based natural resource management and improvement focused on strategic environment assessment and capacity development. Ministry of Forests and Soil Conservation (MFSC) is the lead government ministry, while other key stakeholders including civil

⁹ Federation of Community Forest User Groups (FECOFUN) an advocacy social organization nurtured by the government and the international community, which is currently

registered as a mass membership based natural resources management federated NGO.

society, NGOs, communities, private sector and donors are present in the forestry sector of Nepal.

As participatory forestry, typically community forestry program has been gaining the attention of national and international stakeholders over the last 30 years, different practices were carried out and different experiences were gained respectively to address the social and technical issues and to clear the hindrances but there is still remaining more to do.

Outlook of forestry development in Nepal.

Many countries around the world have a forest management strategy based on social; economic and environmental (SCE) concerns and well-being. Their policies are based broadly on reserve and wilderness preserve; multiuse including recreation and industrial plus private forest. The following table briefly illustrates the forest management and administration history in Nepal.

Table 4 Forest management and administration history in Nepal

Time	Change	Function
Before 1927	No administrative Forest Offices	Distribution of Lands for Farming
1927	Establishment of Kathmahal	To supply Railway sleepers To India.
1939	Establishment of" Eastern Wing and Western Wing"	To manage the supply of sleepers to India and collection of Revenue.
1942	Establishment of DFO with "3 circles and 12 Banjanch"	To control and manage the forest administration
1951	Establishment of 2 circles and 44 Ranges covering the Terai areas. Establishment of IOF	To control and manage the forest administration in Terai. Production of Skilled manpower inside the country
1957	Nationalization of Forests.	
1959	Establishment of Ministry of Forest (MOF)	To cover forest activities nationwide.
1960	MOF was abandoned (lack of staff). CCF office was established with 7 circles and 22 Divisions.	To collect revenue to the country. External assistance started.
1961	Establishment of TCN	To utilize timber from resettlement areas. Protection oriented laws were enabled (1961, 1967, 1970), power to forest staff, women became users, corruption.
1962	Working plans were prepared for some Terai districts.	To start planning processes in forest activities.
1966	Establishment of "Fuel wood Corporation."	To supply fuel wood to Katmandu.
1967	Formulation of especial Forest protection act	To enable the forest conservation & protection activities. DFO became policing and Lawyer.
1968	Establishment of 14 circles and 75 DFOs (but failed due to lack of trained manpower.) Establishment of 7 circles, 22 divisions and "Pradhan Ban Karyala".	To coincide with other administrative structures. To strengthen the organization with available manpower.
1970	Formulation of Forest production rules.	To restrict, control and collect the revenue.

1976	Publish of National Forestry Plan. (9 circles and 40 Divisions covering 75 districts).	To implement the forestry activities nationwide on a planned basis.
1978	Promulgation of Community Forestry Rules	To involve the local people in the management of Forest.
1982	Decentralization Act.	To empower the local level administration.
1983-88	Establishment of 5 Regional Directorates (MFSC) and 75 DFO offices.	To match with decentralization Act.
1989	Master Plan For Forestry sector was made.	To improve the policy of Forestry sector.
1993	5 Regional Directorates (MFSC) and 74 DFOS. Huge reduction in central organization.	To reduce central control. But reduce whole forestry programs.
1993	New Forest Act.	To handover the national forest to the adjoining forest users for accountable management.
1995	Forest Bylaws	To launch the forest management programs according to the Forest act 1993. Complete power to Forest user group for decision-making. HMG stood as the facilitator in CF programs.
1998	Forest Bylaws	To launch the forest management programs according to the Forest act 1993. Complete power to Forest user group for decision-making but legal provision to contribute 40% of CF income as the government treasure.

To the improvement of the forestry sector of Nepal the following recommendation should be followed:

- Recognize inclusive and deliberative processes of policy-making and institutional change.
- Bring policy processes into public domains including those accessible to disadvantaged groups
- Decentralize learning opportunities, resources and practices.
- Promote and recognize civil networks for learning and policy deliberations.
- Allow spaces for experimental innovations and promotion, and allocate resources to absorb sharing opportunities.
- Create multi-stakeholder forums, cross-institutional alliances and collaborative action to promote knowledge interface and transformative learning.
- Promote holistic reflection on practices beyond pre-conceived linear frameworks.

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