Status Review

National Strategies for Sustainable Development
Forestry/Rangeland/Biodiversity

Submitted to
IUCN-The World Conservation Union Nepal

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ACRONYMS

ADB	=	Asian Development Bank
APP	=	Agriculture Perspective Plan
APROSC	=	Agricultural Projects Services Centre
CF	=	Community Forest
CFUG	=	Community Forest User Group
CITES	=	Convention on International Trade of Endangered Species of Wild Fauna and Flora
DBH	=	Diameter at Breast Height
DNPWC	=	Department of National Parks and Wildlife Conservation
DoF	=	Department of Forests
FECOFUN	=	Federation of Community Forestry Users-Nepal
FINNIDA	=	FINNISH International Development Agency
FSMP	=	Forestry Sector Master Plan
GEF	=	Global Environmental Facility
HMG	=	His Majesty's Government
IUCN	=	The World Conservation Union
KMTNC	=	King Mahendra Trust for Nature Conservation
LF	=	Leasehold Forest
LRMP	=	Land Resource Mapping Project
MOFSC	=	Ministry of Forests and Soil Conservation
MOPE	=	Ministry of Population and Environment
NACRMP	=	Nepal Australia Community Forestry Project
NBAP	=	Nepal Biodiversity Action Plan
NCS	=	National Conservation Strategy
NEPAP	=	Nepal Environmental Policy and Action Plan
NPC	=	National Planning Commission
NTFP	=	Non-Timber Forest Products
RCNP	=	Royal Chitwan National Park
UNDP	=	United Nations Development Programme
VDC	=	Village Development Committee

1. INTRODUCTION

The sustainability of Nepalese people is inextricably tied to the productivity and quality of farms, forests, rangelands and their biodiversity. Government policies on agriculture and forestry, therefore, exert heavy impact on the social relationship between men, mountains and the monsoon. Here we wish to dwell upon forestry sector while the agriculture is being dealt separately.

Green cover of forest in Tarai is "the wealth of Nepal" while the forest cover of hills and mountain is the health of Nepal. Adverse impact of deforestation on hills and mountains, and the mass encroachments over Tarai forestland are generally attributed to the forest nationalization policy on one hand and to the malaria eradication programme on the other. Thus it is clear that any national policy or a programme should take into account the biophysical diversity of the nation and should also respect traditional rights and responsibilities of diverse human societies. The impacts are otherwise negative and pervasive.

2. HISTORICAL CONTEXT

The story of forest degradation and environmental deterioration in Nepal goes back to the history of rulers and the ruling class of people who used forest resources and forest lands to raise their riches of wealth and power. The balance of payment for the nation was made favorable on the basis of timber export from Tarai. The end of Rana regime during 1950 spurred the need to Nationalize forests in order to bring forest resources and forestlands from private ownership to public one. Thus the Forest Nationalization Act 2013 (1956 AD) came into being to deprive powerful people from owning national forest resources. As a result, forest resources of all kind became national property. People would not posses any forest land as private property.

The forest resources of hills and mountains were far from being commercialized except for some medicinal herbs and non-timber products. Forests were managed by local communities and ethnic groups through their traditional system of exercising rights and responsibilities. Most reported example are those of "Singe Nawa" system of Sherpas in the Khumbu region (Haimendorf, 1964; NCS 1988), pine needles harvest by woman of Jumla (BK Shrestha, 1993) and other system based upon Mana-Pathi (Bharat Shrestha, 1997). The Forest Nationalization Act (1956) did not respect biophysical diversity of the nation nor it provided any room to respect traditional rights and responsibilities of the people. Thus the Act alienated people from resource use and management. Adverse impacts soon surfaced in the form of environmental degradation on hills and mountains, and mass encroachments on Tarai forest by migratory people and resettlement programs. It was not until 1976 that a National Forestry Plan was envisaged to address the problems of sustainable use of forests through a management policy. It was soon followed by rules governing community and leasehold forestry development in 1978, and those governing private forests came into use in 1983. However, the need to chartering a new course of direction for subsistence use of forest resource in the hills and mountains, and for commercial use of forest in the Tarai and Doon Valleys led to the formulation of the

Master Plan for the Forestry Sector (HMG/ADB/FINNIDA, 1988) endorsed by HMG in 1989. During the same period of time the National Conservation Strategy for Nepal (1988) came into being under the aegis of National Planning Commission supported by IUCN (International Union for Conservation of Nature and Natural Resources). The NCS saught to address contemporary environmental challenges expressed in terms of meeting basic needs of people, conserving natural as well as cultural heritage, and attaining harmony between environment and development.

Nepal's periodic five-year plans for national development incorporated forest, agriculture and environment as the main thrust of development. These sectors need elaborated plans and programmes. Important policy came in the form of NEPAP I (1993), NEPAP II (1998) and the Agricultural Perspective Plan (1995). Current ninth five year plan draws from all these document to charter its course of development.

3. CURRENT STRATEGY

The directive principles of the Constitution of the Kingdom of Nepal 2047 (1990) specifies a policy for mobilizing natural resources and heritage of the country. Explicit mention for the protection of the environment, the rare wildlife, the forests, and the vegetation is a strong message for nature conservation in Nepal.

The National Conservation Strategy (NCS 1988) and the Forestry Sector Master Plan (FSMP 1989) have been providing guiding framework for sustainable development. They dwell heavily upon the problems of meeting basic human needs (food, fuelwood, fodder, timber and NTFPs), conserving biological diversity and maintaining essential ecological and life-support systems. Nepal Environmental Policy and Action Plan (NEPAP 1993) and the Environmental Strategies and Policies for Industry, Forestry and Water Resources (NEPAP-II 1998) provided strategic framework for dealing with environmental issues within the sector. Current policies and strategies are framed under the aegis of several HMG agencies and other supporting organisations (Table 1). Thus, one can easily sense a great opportunity for complementarily and integration of various strategies, master plans, and action plans geared towards environment and natural resources management in order to arrive at a national strategy for sustainable development.

Table 1: Strategic and Policy Documents

Name of Document / yr	*Prepared for*	*Prepared by*	*Financial Support*
NCS 1988	NPC	IUCN	Several
FSMP 1989 (1985-2011)	MOFSC	HMG/ADB/FINNIDA & Jaakko Poyry	FINNIDA
NEPAP I 1993	EPC	IUCN Nepal	World Bank & Ford Foundation
NEPAP II 1998	MOPE	IUCN Nepal	World Bank & Ford Foundation
APP 1995 (1995-2015)	NPC/ADB	APROSC & John Miller, Inc. USA	ADB
NBAP 2000?	MOFSC	Resources Nepal; Other teams	GEF/UNDP

ADB	=	Asian Development Bank	MOFSC	=	Ministry of Forests and Soil Conservation
APP	=	Agriculture Perspective Plan	MOPE	=	Ministry of Population and Environment
APROSC	=	Agricultural Projects Services Centre	NBAP	=	Nepal Biodiversity Action Plan
FSMP	=	Forestry Sector Master Plan	NCS	=	National Conservation Strategy
GEF	=	Global Environmental Faculty	NEPAP	=	Nepal Environmental Policy and Action Plan
IUCN	=	World Conservation Union	NPC	=	National Planning Commission
			UNDP	=	United Nations Development Programm

4. CURRENT STATUS

Forest coverage of Nepal is on decline in spite of the fact that community forestry and protected area management have made considerable progress. The National Forestry Inventory of Nepal 1999 indicates that forest cover has declined to 29 percent (4.27 million ha.) from the previous 37 percent of the country's total land area. Nepal has over 30 major forest types ranging from Tropical Sal Forest to Sub-alpine Birch-Rhododendron Forest. The wealth of flowering plants amounts to over five thousand species and about seven hundred of them are known to have medicinal properties.

The Ministry of Forests and Soil Conservation with its five departments i.e. the Department of Forest, the Department of Soil and Watershed Conservation, the Department of National Parks and Wildlife Conservation, the Department of Plant Resources, and the Department of Forest Research and Survey executes its responsibilities of management, conservation and development of forest resources in the country. The ministry adheres to it its MPFS in delivering goods and services to the people and the country.

The MPFS has the following long term and medium term objectives:

Long term

- To meet the basic needs of people for fuel wood, timber, fodder and other forest products on a sustained basis.
- To contribute to food production through an effective interaction between forestry and farming practices.
- To protect the land against degradation by soil erosion, floods, landslides, desertification, and other effects of ecological disturbances.
- To contribute to the growth of local and national economies by managing forest resources, developing forest-based industries, and creating opportunities for income generation and employment.

Medium term

- To promote people's participation in forest resource development, management and conservation.
- To develop the legal framework needed to enhance the contribution of individuals, communities and institutions to forest resource development, management and conservation.
- To strengthen the organizational framework and develop the institution of the forestry sector to enable them to carry out their missions.

The MPFS classifies forests and protected areas in the following categories (note that the Forest Act of 1993 does not exactly follow this classification)

National forests:	All forests except those designated otherwise (now called government managed forests).
Community forests:	Forests entrusted to user groups for management and sustained use.
Private forests:	Forests or trees raised and managed on privately owned land.
Leasehold forests:	Forests on land that has been leased by central and local agencies of the government or private owners, to individuals, cooperatives, institutions, or commercial firms.
Religious forests:	Forests belonging to religious institutions under the Guthi Act.
Protected area/	
Conservation areas:	National parks, reserves, protected areas, or other categories gazetted under the forestry sector legislation.
Protected watersheds:	Any land in public or private ownership designated as protected watershed under the soil and Water Conservation Act.

The NCS (1988) viewed forestry sector as a major contributor to environmental management in reducing ecological hazards and in providing basic essentials of fuel wood, fodder and timber. It also envisaged forestry as a contributor to gross domestic product as a source of off-farm employment opportunities. The NEPAP dwelt heavily upon building up enabling tools like legal provisions, adoption of a national land-use policy, reorient forestry researches and also apply EIA on forest-related projects. It saw the need to integrate rangeland management in the forestry sector in the process of sustainable development and poverty alleviation. The 9th plan aimed to focus on poverty alleviation as its main target. The plan specifies the need to integrate agriculture and forestry sector in order to achieve sustainable economic development. Thus there is a major shift of focus in forestry sector i.e. from sustainable development of forest to the forests for sustainable development. Similarly in the frontiers of protected area and nature conservation, there is a shift from authorities/army for parks to parks for people, and people for parks. Besides, the forestry sector has also recognised the importance of biodiversity. Therefore, a shift of strategic focus is visible i.e. from species conservation to ecosystem conservation. A National Biodiversity Action Plan is nearing its completion as a part of Nepal's response to the International Convention on Biological Diversity of which Nepal is a party.

5. FORESTRY SECTOR PRIMARY DEVELOPMENT PROGRAMMES

His Majesty's Government of Nepal has endeavoured to empower people through their active participation in managing forest resources every since the democratic government was restored in 1990. Forest resources are therefore clearly seen in two management regimes i.e. (i) community managed forest resources, and (ii) government managed forest resources.

5.1 Community Managed Forest Resources

Five forest types come under this category.

- Community Forests
- Leasehold Forests
- Private Forests
- Religious Forests
- Rangelands

5.1.1 Community Forests

Community forestry has a successful history ever since it was conceived during 1976 when the National Forestry Plan was prepared. It has gone through various evolutionary processes. Later on it was guided by NCS (1988), the MPFS (1988), the Decentralization Act (1982), the Forest Act (1993), and the Forest Regulations (1995). Community forestry transfers the control over the common lands from the state to the village communities, but this need not include ownership of land. However, there should a perfect demarcation to indicate which parts are controlled by whom. Main obstacles to this process are generally attributed to the bureaucracy and the political power who live by controlling the region.

Community forestry means a national forest land handed over to a user's group through an interactive/democratic process. The Forest Act legally empowers the Community Forest User's Group (CFUG) for conservation, sustainable use and sharing of benefits that flow from the resources. The CFUGs are required to be abided by an operational plan endorsed by the office of District Forest Officer. The government has also recognised a national body called the Federation of Community Forestry Users-Nepal (FECOFUN) to ensure stronger community rights and responsibilities in the process of building productive relationship between the people and the government.

The number of CFUGs is ever increasing in the database of the ministry. About 8000 CFUGs are managing over 700,000 ha. of forestland. It encompasses half a million household in the mid-hills of Nepal. A number of success stories associated with CF is available. Some them may be cited as following:

- Karnali Zone: "Diyargaon". A study of change in the western mountains of Nepal (Bihari K. Shreshta, 1993) has clearly indicated a major indicator of change in

community forestry. The case of "Diyargaon" in the district of Jumla is cited as following

"At least in Diyargaon, however, the village forests have a different story. The village is surrounded by mountains on the north, east, south, and south-west, and they are either covered by pine forests or are in the process of being so. The village women, whose exclusive task is to bring firewood from the forest, do not have to walk more than twenty minutes to reach the forest.

The villagers use forest products rather liberally under the conviction, apparently borne out by experience, that the forests today are more dense than in the past. To substantiate their claim, they point to one of the mountain sides which was once known as *eklo sallo* or, "the lonely pine", and which had only one big pine tree on it. Today, there are pines growing in thousands on the slope. It is said that the villagers, under the influence of the government's Community Forestry Programme, abandoned the traditional practice of burning the slopes ten years ago, and this resulted in better grass yields for livestock and such, through nascent, massive regeneration of forest.

- Chitwan: National Park Buffer Zone: Baghmara Community Forest

  The conflict between the communities of people residing in the proximity of protected areas and government authorities policing them emerged as the main threat for biodiversity conservation in Nepal's protected areas. Army personnel were being mobilised to protect animals such as tigers and rhinoceros, and scarce government resources were being spent for protecting animals while people felt marginalised and humiliated. "People are far less worth than animals ..... government cares more for animals and least for the people". Such were the feelings among the people during the decade of 1970s. Nepal's conservation community from government as well as the non-government organisations took serious note of it, and a shift of conservation policy and management paradigm began to take place during mid eighties when the National Conservation Strategy for Nepal was being developed and endorsed.

  Baghmara Community Forest lies in Bachhauli Village Development Committee (VDC) in the buffer zone of the Royal Chitwan National Park (RCNP). The Baghmara forest was within the government jurisdiction and mainly used for fuelwood and fodder to meet subsistence needs of the surrounding communities until 1988. People also used this forest to earn extra cash by selling the grass. Establishment of a nearby paper industry was seen by local people as an opportunity to make extra earnings through grass selling to the factory. For some years, grass cutting helped to increasing the income of people but did not prove sustainable. Over-exploitation of grass and other forest resources without a legal provision and a proper management system started to rapidly deteriorate the resource base. Confrontation between the community and the District Forest Officer was a day to day affair. The forest-dependent communities soon realized the situation, and initiated steps to find a long-term solution. In 1988, local people unanimously decided to conserve the Baghmara forest and the first step was the

controlled grazing. This effort helped but was not enough. The community decided to go for Community Forest.

The King Mahendra Trust for Nature Conservation (KMTNC) came to the help of Baghmara village. Within a couple of years, KMTNC facilitated the community to constitute CFUG. The constitution and operational plan was finally approved in 1995, although conservation measures started much earlier.

Since them protection and plantation has been simultaneous. Currently 56% of the area is covered by tree plantation, 20% is under natural regeneration, 17% consists of mixed plantations, and only 2.6% is under grassland coverage. This forest supplies 475 tons of fuelwood from thinning and pruning, 1850 tons of dead-and-dry fuelwood, 390 tons of thatch grass and about 7,250 tons of fodder. Thus, this forest is now able to sustain the needs of over 3,600 human and 4,000 livestock population of the VDC. Baghmara community forest has an advantage of having direct land-linkage with RCNP. This park is a favorite destination of several thousand tourists and is well known for the conservation of one-horned Rhino and the Royal Bengal tiger. The park generates significant revenues for the government through eco-tourism. The users of Baghmara CF saw eco-tourism potential of their forest to generate additional income to the community.

The forest, once degraded and deprived of wildlife has now become a vibrant habitat for over 20 species of mammals and 162 species of birds. It is inhabited by sloth bears, leopards and deer. Tigers are also occasionally sighted. About 10 rhinos reside in the Baghmara forest. Rhinoceros and other wildlife, once considered as the foes of farmers and peasants are now the source of income for the communities. The communities are now partners for managing park and are involved in controlling rhino poaching. These days, killing rhino is like slaughtering the goose that lay golden eggs.

The Rapti is a perennial river that flows across the Baghmara community forest, and there were no crocodiles in it before the area was designated as CF. In the process of enhancing eco-tourism, the users group also rehabilitated fresh water wetland habitats. Now fishing is controlled and fish poisoning is strictly prohibited. These days, about 20 rare Gharial crocodiles are present in the Rapti river and their population is in increasing line. Further, many water holes and ponds are created within forest and grassland areas. These ponds attract birds and wildlife. Visitors easily sight rhinos around the ponds and Gharials in the Rapti, while birds are in plenty.

Local nature guides take visitors for the CF-safari tours and make wages. Nabin Adhikari is one of them. He says that visitors prefer CF for animal sighting since the grass swards in CF are shorter and riding on elephant back to sight rhinos and tigers are equally exciting. The second reason is the entry fee that visitors pay i.e., NRs 100/- per individual for jungle walk, NRs. 650/- elephant riding and animal sighting. Visitors get additional satisfaction due to the fact that their spending go directly to the local community. Besides, it also helps minimizing pressure in the core area of the park.

Annually, Baghmara CFUG is making 1 to 1.3 million rupees from eco-tourism and this figure is much higher than the amount obtained from selling of grasses. The users group decides to use their earnings in maintaining forest quality and in applying protection measures due to wildlife depredation. A major share of income goes in local development activities like trail maintenance, bridge construction, culverts, irrigation, river embankments, flood control, check dams, non-formal education and so on. Bishnu Aryal, the chairperson of Baghmara CFUG informed that the annual income is largely being spent on restoring ecological integrity of the forest including silviculture practices, tourism infrastructures like toilets, trails, bridges and view towers. Certain proportion goes into the Community Trust Fund. The demonstration effect of this community management has prompted people of other adjoining area to establish eco-tourism based community forest (IUCN Nepal 2000).

- Other examples:

  The joint technical review of community based forest resource management presented the case of high altitude forest management in its issue paper no 10 (Kumud Shrestha, Ram Chhetri and NACRMP 2000). The paper cites the case of Gorkha district where the status of forest over a ten year period has increased in spite of increased population of people and their livestock (A study requoted from Fox 1993). Similarly the case of Bagan Chhap area of Kabhre district has been described as a success indicator of community forestry (Miller, 1999).

Community Forestry of Nepal has been quoted oft and on in a large number of literatures. However there are some limitations, deficiencies, irregularities, and inconsistency in administrative as well as legal procedures. Major points to consider are as following:

Ecological Considerations

1 CF in Tarai and Madhesh has a set of separate issues due to the commercial value of Tarai forests and ready market across the border. It can not be compared with the situation in Hills/Mountains. Community forestry is understood to be meant for fulfilling basic needs of local communities in general and not for commercial purposes. The CF of Tarai, Madhesh and Chure lie in the Tropical Zone and largely consists of Sal trees. It's a legally band item for extraction, use and export. However, it is the prime item of export in the timber trade. The tropical zone is most fertile and is readily encroached for agriculture. The zone is quite accessible and it is very much favoured for commerce, industry and urban development. Therefore a Tarai strategy of CF has to evolve in order to address a different set of issues arising from ecological conditions, geographical location and economical prospects of the region.

2 CF in the high altitude region has another set of issues that differ from Hill/Tarai due to environmental value, tourism value, and remoteness of the area. High altitudes are rich in NTFP specially the medicinal plants. These resources are used as open access common property. Economic value of several items e.g.

Yarsagombu (*Cordyceps* sp.) and morchella mush-room is going much too high. This has created several abnormalities in resource use and conservation. Thus a mountain strategy of CF should be developed to encompass natural resources of mountain biodiversity.

Economic Consideration

A strategy for sustainable development has to have its direct relevance with local as well as national economy. The CF programme also is to be judged in its capacity in achieving income generation and helping to meet the objectives of poverty alleviation. However, it is generally experienced and expressed that it is primarily the better-off people who become members of forest user's groups where as economically deprived/disadvantaged groups (ethnic minorities, occupational castes, etc.) are usually not included as members (Elvira Graner, 1977). There are other implications of CF to disadvantaged people who are deprived to use CF for their livestock grazing. Common property forests become strictly CFUG controlled property.

5.1.2 Leasehold Forests

The provisions for Leasehold Forest (LF) are limited to "degraded land" i.e. "unforested forest land" which requires long-term investment. Such a principle may encourage forest-degrading activities in order to apply a lease for the area. This is possible in the face of a weak forest administration.

The LF programme is currently designed for the landless and poor households who are alienated from community forest programmes. Although it is viewed as a complementary process to CF, there is a serious hurdle in administrative process. The final authority for a lease lies with the secretary of the MOFSC. This programme is targeted to poverty striken people who can hardly cruise through the bureaucracy from their household to the central administration. Besides the LF is an integrated approach and the people should deal with four agencies including the DFO. The LF and CF have not yet been received as complementary programmes. Some basic conceptual and policy amendments are required to put it into a meaningful practice. Once a LF come to a healthy state then there is a risk of its being transformed to CF because the govt. policy goes in favour of CF when there is a dispute.

5.1.3 Private Forests and Trees on Farmland

Private forestry is showing promising results in some districts like Ilam where large volume of wood (Alnus i.e. *Utis*) and bamboos are exported outside the district. Similarly, mass plantation of *Sisso* in the Tarai and the Doon valleys has shown promising results. However some legal contradictions for free movement and marketing of forest products from private lands are major hurdles. Besides there is a serious set back in backstopping farmers with scientific research as has been evident by the recent epidemic on *Sisso* plantation.

Some of the most popular trees of farmland such as Sal (*Shorea robusta*), Champ (*Michelia* sps.), and Khair (*Acacia catachu*) are being declared as contraband items for extraction, transport and export. Thus, these species which have had high commercial value would not be cultivated as private trees. People even fear that the government would take their land away if these trees go to form a private forest. The irony of the fact remains that these are self regenerating trees in the tropical zone of Nepal lying below 1000m altitutde. People tend to clear them out from their private land in order to avoid legal problems arising from the growth of contraband species of tree.

5.1.4 Religious Forests

Religious forests and sacred grooves are being considered as an important component in all societies of Nepal. Their history may be traced back to Vedic periods, the Ramayan period and the Buddha period. They function as an integral part of cultural heritage and spiritual resources. In most part of midland Nepal religious forests and sacred grooves of trees represent the relict of climax forest and opportunity to use them as seed bank of indigenous trees and other associated plants, remains unexplored/unexploited. Tree worship, tree plating, the protection of forests containing sacred sites and the social structures created to manage religious forests can contribute to forest conservation (Ingles, 1994). So far, very little work on religious forest of Nepal has been performed.

Forest legislation provided legal status to religious forests since 1976, and it has been reenforced by the Forest Act 2049 (1993) and the Forest Regulation 2051 (1995). The Forest Act specifies that a religious forest is a National Forest of any religious place or its surroundings handed over to a religious body, group or community for its development, conservation and utilization for religious activities other than commercial purposes. It allows the community to utilize the forest products for religious activities and not for commercial purposes. This policy is conducive to enhance biodiversity quality of religious forests.

5.1.5 Rangelands

About 11 percent of Nepal's territory constitute of rangelands and most of it lies above the tree-line (about 4000 msl). Rangelands are integral part of mountain societies and they are managed as open access resources through indigenous practices which varies from place to place. Use of rangelands is rather seasonal but they are rich in biological resources especially grasslands and pastures, alpine flowers, medicinal herbs, and spiritual plants and animals including the Yeti. The NEPAP (1993) and the NBAP (2000, Draft) brought rangelands in national agenda of conservation and development. However, the management authority for rangelands is unclear. Legally rangelands have been nationalized but de facto they are owned by traditional societies like Kipat-holders, Mukhias, Talukdar and so on. The conflict between the parks and the people in mountainous regions is largely triggered due to grazing issues on rangelands. Current thinking as regards to linking mountain

protected areas would enhance such conflicts if careful strategies are not put in place.

5.2 Government Managed Forest Resources

All forest lands except those designated otherwise are to be managed by the government through District Forest Offices.

5.2.1 National Forests

Forests land defined in the Act, do not necessarily have to have forest cover. They could be forested lands with dense forest cover, natural shrublands or degraded forest with regenerating shrubs and coppicing trees, grasslands, wetlands or barren lands. In effect any landmass not registered legally as private property may be defined as National forestland. A forested land or a forest is defined as "all land with a forest cover, i.e. with trees whose crowns cover more than 10% of the area, and not used primarily for purposes other than forestry. Temporarily clean-cut area that will be planted is also forest area." (Forest Resources of Nepal 1987-1998, Dept. of Forest Research and Survey, Ministry of Forests and Soil Conservation, HMG Nepal/Forest Resource Information System Project, The Govt. of Finland. Publication No. 74 Nov. 1999). On the basis of this definition, the forest cover of Nepal has decreased from 37% to 29% which was established by LRMP results from 1978/79. Taking the forest and shrub together the coverage has decreased from 43% to 39.6% of total land area of the country. However, total land area of the country is not known in terms of cadastral survey. What is known is just the area defined by a flat map without accounting the verticality of land surfaces. Thus the success stories of community forestry is the hills is perhaps lost in national accounting. Therefore, there are some technical questions to be addressed in the forestry sector which are as following:

1. What is a tree ? Do we define a tree in terms of its dimensions (DBH and height) or in terms of species ? A tree of sub-alpine zone (Brich trees) could well be a shrub of the Tarai Forest in terms of its stature and dimensions.
2. What is a forest ? Is the 10% crown cover justifiable for all physiographic zones.
3. How to account forest area in real terms when we deal with the slope of mountain terrain.
4. Don't we need a national system of forest classification to deal with the diversity of vegetation types that amounts to 118 types (Biodiversity Profiles Project, 1995).

Management policy for national forest keep changing with time. The recent policy (April 200) of the government as regards to the management of Tarai, Chure and Bhitri Madhesh (Doon Valley) has indicated that large blocks of forest in the Tarai, Siwaliks and the Doon Valleys will be managed by the government in a collaborative management approach. The management model has not been defined yet. Perhaps some guidelines may be derived from the Indian model of Joint Forest Management.

The policy also emphasizes to share 25% of the income from the sale of forest products with local government (VDC/DDC) to spend on local development programmes. Thus the new policy will limit the possibilities of community forestry expanding into commercially valuable forests of the Tarai, Siwalik and Doon Valley. Salient features of the ministerial concept paper (April 28, 2000) may be summarized as following :

- Large blocks of forests in Terai and Siwaliks would remain as government-managed forest.
- A collaborative forest management approach will be adapted in Terai.
- Green Trees will not be felled for commercial purpose at least for next five years as existing demand of timber can be fulfilled from the present stocks, and dead, diseased and dying trees.
- Open forestland and shrub land would gradually be handed over to local population as community forests.
- The mandatory provision of annual increment even in community forest operational plan.
- Siwaliks will be protected and integrated with community based soil conservation and watershed management programs.
- 25% of the income of the government-managed forest will be provided to local government.
- One of the main objectives of community forestry is being understood to be meant for fulfilling basic needs of local communities in general, not for commercial purposes.
- 40% of the selling price of the surplus Timber from community forests to be provided to government.

5.2.2 Protected Areas

Parks and Protected Areas in Nepal evolved through three distinct phases during last three decades. The first phase of 1970's was devoted to creating National Parks and Wildlife Reserves in order to protecting rare and endangered wildlife. The second phase of 1980's was dominated by the concept of Conservation Area where eco-tourism emerged as a new agenda in conservation. The decade of 1990's devoted itself to resolve conflicts between parks and people living within and around the protected area. Next millennium should however look into the full potentials of biodiversity conservation where all living organisms will be considered, their ecological functions realised, their genetic resources appreciated and their habitats conserved for posterity. Meanwhile the three objectives of the international Convention on Biological Diversity, namely conservation, sustainable use, and equitable sharing of benefits should remain as the guiding principle for conserving protected areas.

References of nature conservation go back to antiquity and living in the wilderness was an essential phase of human life for learning from sacred teachers. Besides, forests were also preserved for recreation and hunting for emperors and kings. Sacred forests are still in existence in parts of Nepal. However, protecting certain areas through national proclamation has a recent history. The first National Parks of Nepal was established in 1973 as Royal Chitwan National Park in order to safeguard the existence of One-horned Rhinoceros and associated game animals including the Royal Bengal Tiger. Currently Nepal has declared 8 National Parks, 4 Wildlife Reserves, 1 Hunting Reserve and 4 Conservation Areas (Table 2). It amounts to 16.81 percent of Nepal's territorial area. Most of protected areas were created to safeguard wildlife habitats. This would also amount to protect vegetation and its flora. However, there has not been any assessment to ascertain what elements of the flora or the forest are actually preserved in those parks and protected areas. What role the protected areas are playing in the context of floral conservation is not yet fully regarded or recognised.

Table 1: *A Synopsis of the Protected Area*

Protected Areas	Area (Km)	Altitude (m)	Climate
NATIONAL PARKS (IUCN Category II)			
Royal Chitwan (1973)	932	150-815	Tropical monsoon
Sagarmatha (1976)	1148	2845-8848	Temperate to Alpine
Langtang (1976)	1710	720-7245	Sub-tropical to Alpine
Rara (1976)	106	2800-4048	Temperate to Sub-Alpine
Shey-Phoksundo (1984)	3555	2000-6883	Temperate Alpine
Khaptad (1984)	225	2800-3300	Temperate
Royal Bardia (1976 & 1988)	968	152-1441	Tropical monsoon to Sub-tropical
Makalu-Barun (1991)	1500	435-8463	Sub-tropical to Alpine
WILDLIFE RESERVE (IUCN Category IV)			
Koshi Tappu (1976)	175	100-150	Tropical monsoon
Parsa (1984)	499	100-150	Tropical monsoon
Shivapuri (1984)	144	1366-2732	Sub-tropical to Temperate
Royal Shuklaphanta (1976)	305	90-270	Tropical monsoon
CONSERVATION AREA (IUCN Category VI)			
Annapurna (1992)	7629	1150-8091	Sub-tropical to Alpine
Kanchanjungha (1997)	2035	1200-8568	Sub-tropical to Alpine
Makalu-Barun (1991)	830	435-8463	Sub-tropical to Alpine
Manaslu (1998)	1663		Sub-tropical to Alpine
HUNTING RESERVE (IUCN Category IV)			
Dhorpatan (1987)	1325	2850-5500	Temperate to Alpine
Total	24,749	16.81 percent	
BUFFER ZONE			
Royal Chitwan (1996)	750	Approximately 18.84 percent area of Nepal falls under the Protected Area and their Buffer Zones.	
Royal Bardia (1996)	460		
Langtang (1998)	420		
Shey-Phoksundo (1998)	1349		
Total	2,979		
Total Area	27,728		

Source: Annual Report (2054/55) of DNPWC.

Establishment of protected areas in early days during 1970s and 1080s often excluded people and the area was managed as a "locked box" often guarded by armed forces. More recent approaches have been able to create a new and more positive relationship between local people and the park management. The provision of buffer zone where park revenue is shared with the community, is creating a congenial working relationship with otherwise confronting communities. This is however not enough to reap the full potentials of protected area. The "locked box" has to be opened through serious researches that unfold the value of biological resources contained in the box. This warrants a strategic planning for research and development in and around the protected area. This should allow to establish linkages between biotechnology and protected areas.

Protected areas of next millennium are bound to face severe pressure from tourism as wilderness and primeval areas continue to shrink all over the world. Bio-prospecting will be more and more concentrated in and around protected areas, and thus protected area managers should be well equipped with required information in order to negotiate benefits arising from commercial exploitation on genetic resources protected in the park. The first step should, however, be geared to inventory and register the resources, to understand ecological functions of the park, and to establish confidence and faith with the people.

5.2.3 Protected Watersheds

Nepal's ecological stability is very much dependant upon the two major factors i.e. the mountains and the monsoon, and the single major actor the Man (human beings). The interaction between and among men, mountains and the monsoon is the key to watershed management in Nepal. The government plans and community participation in watershed management face serious problem when underlying causal factors of landslides, mass wasting and erosion related with geophysical dynamics of the mountain are not considered. Similarly, management interventions do not bring desired results when the management plan fails to address the dynamics of ecosystem at local level such as forest ecosystem, wetland ecosystem, grassland ecosystem, agro-ecosystem and the dynamics of water region.

Nepal's 141,191 sq. km. of its territorial area is spread as high as 8,000 m in its verticality of mountains and the country is drained by over 6,000 streams and rivers. Thus the challenge of watershed management stands at a very high level. There is a dire need to analyse the country on the basis of ecology and economy to identify hot spots to prioritize watershed for protection, conservation and development of infrastructures including roads, canals and hydro-electric dams. So far the government has proclaimed only one area for watershed conservation i.e. Shivapuri Watershed in Kathmandu Valley, while extension works are carried all over Nepal.

Period plans of the government aim to extend goods and services in all districts of Nepal to help people in solving following problems and issues.

- Natural hazard prevention
- Protection of development infrastructures

- Conservation of land productivity
- Conservation of soil
- Promotion of Income generating activities

The Department of Soil Conservation and Watershed Management sets its objectives (i) to help people to meet their basic needs for forest and food products by improving land and agricultural productivity through proper conservation and utilization of water resources, and (ii) to assist in maintaining the environmental balance in the country's watersheds by reducing pressure from natural hazards like floods and land-slides.

A watershed is an integrated entity where all development and conservation activities converge. Therefore, a sectoral approach turns futile. A watershed should be identified as a planning unit and each of them should have sound information on soil and geology, geography and climatology, forestry and vegetation, agriculture and rangelands, and socio-economic dynamics of the people.

5.2.4 Medicinal and Aromatic Plants

The Himalaya offers diverse habitats for the occurrence of a large number of medicinal and aromatic plants. Over 117.40 million people in and around the Himalaya have a tradition of using healing herbs from nature. Nepal, as a Himalayan kingdom, has a record of over 700 species of medicinal plants. There is a store of still un-written and undocumented traditional knowledge on the use of plants for healing purposes.

Medicinal and aromatic plants occur in all the bioclimatic zones of Nepal. Some of the reputed medicinal plants like *Rauwolfia serpentina, Terminalia chebula, Phyllanthus emblica* occur in the tropical zone (below 1,000 m altitude); *Dioscorea deltoidea, Adhatoda vasica, Swertia chirayita, Cinnamomum tamala, Rubia manjith* occur in the sub-tropical zone (between 1,000-2,000 m); *Aconitum ferox, Dactylorhiza hatagirea, Lycopodium clavatum, Taxus wallichiana, Juniperus recurva, Paris polyphylla* occur in the temperate zone (2,000-3,000 m); and *Nardostachys grandiflora, Rhododendron anthopogon, Picrorrhiza scrophylariaeflora, Rheum nobile, Cordyceps sinensis, Podophyllum hexandrum* occur in the sub-alpine zone (3,000-4,000 m), and the alpine zone beyond 4,000 m. The steppic dry desert biome in the trans-Hiamalaya is rich in *Ephedra gerardiana, Hippophae tibetica, Artemisia* sps., *Allium* sps. and so on.

Shakya and Malla (1984-85) have confirmed 510 species of medicinal plants, and of them 53% (340 Sps.) occur in the sub-tropical zone (1,000-2,000 m). The tropical zone harbours 310 species, while the temperate zone has 225 species, sub-alpine zone 140 species, and the alpine zone 45 species.

Nepal government made efforts to improve export of crude herbs as early as 1937 A.D. However, an organised department was not visualized till 1960 AD. The Department of Medicinal Plants currently renamed as the Department of Plant Resources oriented itself towards scientific validation and research of Nepalese

medicinal plants. The establishment of Royal Drug Research Laboratory now called Natural Products Development Division, the Royal Botanical Garden, the National Herbarium, experimental herbal farms and extraction units are major achievements of the Department. Currently, the herbarium houses about 100,000 specimens and an ethnobotanical museum is also attached with it.

The export of medicinal herbs from Nepal Himalaya was limited to India and China until 1960 AD. Nepal's trade diversification has promoted herbal trade to oversea countries. Data from the Trade Promotion Centre show that export quantities amounted to over 4,000 metric tons during mid-1970s but the trend declined sharply during the 1980s (Malla, 1994). However, the trend is on increase again, reaching about 13,600 metric ton in the year 1992-93. The major bulk of trade is still with India amounting to 99 per cent (Malla *et.al.* 1995).

The world community is advocating the conservation of living resources for sustainable development. Over exploitation of wild growing medicinal herbs is leading to drastic decline on the occurrence of some important herbs like *Rauwolfia serpentina, Dioscorea deltoidea,* and *Dactylorhiza hatagira.* Nepal is also a signatory of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES).

The diversity of the species in Nepal flora offers great opportunities for the search of medicinal substances, not yet described or discovered. Medicinal herbs could be viewed as a significant source of income for rural communities. Increasing worldwide demand for medicinal plants also invites the danger of over exploitation and extinction of species. Therefore, the world community as the consumer and the natural resource rich countries as the exploiter would both need information as their management tools.

The poorest of the poor people in Nepal have valuable medicinal and aromatic plants in their own surroundings. Unfortunately a number of them fall under government restrictions. Thus the moment they are collected, people are vulnerable to legal harassments/to trade traps. Even herbs of cultivated origin are subjected to government permissions. An illiterate peasant has to procure government permission to collect the resource and has to observe that the resource leaves the district in a prescribed period of time. Thus, his/her bargain power is lost to the agents of big buyers. Further the interpretation of regulations, both national as well as international, for collection and trade is controlled by government officials. Even products from community forests and private forests are treated in the same way as wild resources. Thus the prospects of alleviating poverty of people in remote districts of Nepal through best use of their natural renewable resources are overshadowed in the secretive and lucrative trade controlled by trans-border buyers and distant companies. Therefore HMG should immediately look into the problems faced by farmers and peasants due to legal restrictions and administrative procedures in collection, use, and sale of medicinal and aromatic plants. A standard to monitoring the status of medicinal herbs and aromatic plants should be established through scientific studies. The "Users Group" concept of Community Forestry may well be tried to determine rights and responsibilities of herb collectors.

5.3 Biological Diversity (Biodiversity)

Biodiversity encompasses the diversity of all life forms and their living spaces. Besides it also include genetic diversity of an organism. Therefore, biodiversity is not synonymous to protected areas, nor protected areas should be regarded as "untouchable" islands reserved for wildlife and their ecosystem. Just declaring some areas as protected area does not fulfill the range of responsibilities defined by the Convention of Biodiversity Diversity. The three objectives of Biodiversity i.e. conservation, sustainable use and equitable sharing of benefits could only be addressed through a productive partnership of all sectors while recognising the independent roles of responsibilities and special capacities of each. The National Biodiversity Action Plan of Nepal should develop a platform for linking development objectives with wise management of biological resources, indigenous knowledge system, and biotechnological advancement. The synergy between biodiversity and biotechnology should be developed through a dialogue between biodiversity rich countries (developing) and technology rich countries (industrialized). The bargaining power is better strengthened through regional cooperation because biodiversity do not respect boundaries of a nation. A regional strategy on biodiversity would place developing countries in a better position for bargaining and business with industrialization nations.

Nepal has thus far responded to global demand of biodiversity conservation through managing over 18 percent of its territory in a protected area system. The buffer zone management policy and conservation area policy has successfully demonstrated how people can participate in protection of nature. This approach is successful especially in areas that earn a lot from tourism e.g. Royal Chitwan National Park, Annapurna Conservation Area and the Sagarmatha National Park. Economic incentive to the communities of people in the buffer zone area of other protected areas have to be developed through other innovative means such as sustainable harvest of NTFPs, conservation of genetic resources of indigenous agricultural, horticultural and livestock diversity of Nepal. Bio prospecting of mountain regions, the rangelands, and the wetlands should unfold economic opportunities for local people. The National Biodiversity Action Plan has suggested to develop national policies on mountain biodiversity, rangeland biodiversity, and also on wetland biodiversity. A national biodiversity policy as has been developed in India and elsewhere should be regarded as a first step to safeguard biological wealth of Nepal in order to ensure the fair and equitable sharing of benefits arising from the use of resource both nationally as well as internationally.

Nepal's Biodiversity Action Plan under preparation sets out 10 guiding principles which addresses the following key elements:

1. *In-situ* Conservation
2. Poverty alleviation
3. Involvement of indigenous people
4. Equitable sharing of benefits

5. Sector integration (Protected areas, forestry, agriculture, wetlands, rangeland and mountains)
6. Capacity building (institutions, women participation, etc.)
7. Public support, education and awareness
8. Monitoring and assessment of biodiversity
9. Policy and legislation for cross-sectoral coordination
10. Alternative energy

The NBAP has identified 6 areas in the sectoral conservation strategies:

1. Forests
2. Rangelands
3. Protected area
4. Agro-biodiversity
5. Wetlands
6. Mountain biodiversity

The NBAP has outlined its timeframe into three periods such as long-term (1-13 years), medium term (1-8 years) and short-term (1-3 years). It is adjusted with the government's period 5-years plans (9^{th}, 10^{th} and the 11^{th} plan) that extends to the year 2012. (NBAP [Draft] 2000).

6. CURRENT EMERGING ISSUES IN THE FORESTRY SECTOR

Main issues with the government owned forest are related with the quantity of forest in terms of coverage and biomass and with the quality of forest in terms of biodiversity and the vitality of ecosystems. There has not been any rapid methods to assessing the quantity and quality of national forest nor scientific management plans are being implemented after their formulation. Thus government owned forests are just managed through a process of implementing existing legal mechanisms which are activated in the event of illegal incidences. Management inputs to improve the biomass and biodiversity are limited to afforestation of degraded areas and protection of existing properties. The challenge to protect and manage over half a million hectares of commercially valuable Sal forest in the Tarai region remain conspicuous and outstanding. Recurring problems such as human settlements, forest depletion, natural calamities like forest fires and the floods, soil erosion and political interferences divert attention and available resources.

Other issues of main concern are directly related with (i) land use planning for sustainable development, (ii) satisfying basic needs of ever increasing population, and (iii) sustainable utilization of forestry resources to generate resources for national economy. The Ministry of Forests and Soil Conservation examined those issues by organising a Joint Technical Review of Community Based Forest Resource

Management that took place in November of 2000. The list of issue papers are as following:

Issue Paper 1	Protection versus Active Management of Community Forests
Issue Paper 2	Basic Needs and Commercialization
Issue Paper 3	IGA Program and NTFP Management In Community Forest Users Groups
Issues Paper 4	Support Services to Community Forest User Groups
Issues Paper 5	Governance, Monitoring and Evaluation System in Community Forest
Issues Paper 6	Partnership and Autonomy
Issues Paper 7	Issues of Income, Taxes and Subsidies
Issues Paper 8	Livelihoods, Equity and Gender Issues in Community Forestry: Gaining Perspective on Poverty
Issues Paper 9	Community Forestry Management Issues in the Tarai
Issues Paper 10	High Altitude Forest Management
Issues Paper 11	Policy and Legal Framework Issues

7. ISSUES FOR DIALOGUES

1. Forest area of Nepal continues to shrink. Forest statistics do not account for sloping surfaces of mountain physiography. Defining a tree, a forest or a forestland is still ambiguous. There is a need for a national system of forest inventory and classification based upon ecological realities of varied physiography.
2. Protected area expansion is based upon rare and endangered biological species and not upon ecological stability of the region. Protected area coverage and their buffer zone area has expanded from less than 10% to over 18% in last 10 years. Access to protected areas is not as stringent as it used to be during early days. People's participation through Buffer Zone management has illustrated positive impacts on biodiversity conservation. Protected area management has shifted towards attaining sustainable rural environments (e.g. Annapurna Conservation Area Project and Shey-Phokumdo National Park) supported by tourism. A self-sustaining mechanism for rural regeneration in the vicinity of protected areas or elsewhere has to be persued by policy especially in fragile mountain ecosystem.
3. Policy interventions at national level such as forest nationalization and malaria eradication have often resulted into unintended grave consequences on environment and development. Sudden ban imposed on export of medicinal herbs has impacted adversely to the rural poor. They become the victim of their own environment just because a banned item is occurring near his farm. Policy

interventions in a heterogeneous country leads to heterogeneous results. Therefore, homologous regions (ecologically, economically and ethnographically) have to be defined in order to determine impact zones of policy interventions. Nepal's forestry policy geared towards community (social) forestry, and agricultural policy to transform subsistence-based agriculture into a commercial one would need a strategy to deal with varying conditions in the Tarai, hills and mountains.

4. Nepal needs larger proportion of its population in the countryside not only to safeguard mountain environments but also to make wise use of its comparative advantages including those of its geopolitical position. A strategy to hold people in their home environment has to be developed for national sustainability as well. Such a strategy should effectively deal with inaccessibility, fragility of resource base, and weakened human capacity embodied in low educational and health services.

5. A countryside ecology is very much dependent upon a balanced relationship between farms and forests. Nepal can provide a large variety of products (farms/forests) than large quantities of a product. Greater investment is therefore needed to access diversity of resources through transport and communication networks in order to promote agro-industry, forest based industry and NTFP processing industries at scales appropriate to sustainable harvest.

6. Research capacity in Nepal is still in a rudimentary state and has not been able to develop appropriate resource assessment methodology, monitoring procedures, and protection measures (diseases, etc.). Forests and plant resources need a new thrust of research policy to bring about a synergy between biodiversity and biotechnology. Biodiversity management in Nepal should have strong linkages with modern technologies.

7. Legal mechanisms as regards to the access to biodiversity of Nepal and for establishing a system of benefit sharing have yet to be developed.

8. Adding buffer zone to a protected area or expanding corridors to link various parks/protected area would mean regulating or reducing community power over natural resources as compared to provisions in community forestry. The shift of jurisdiction from DoF to DNPWC is a major impact not only on the community but also on the capabilities of DNPWC. The MOFSC could well review the situation to harmonize power, authority, responsibility, sanctions and resources for the local people in buffer zone system, conservation area system, community forestry system and the national park system itself.

9. Community forestry is a process to empower people for improving their quality of life. However, there is an emerging need to monitor processes and products. Transformation of degraded forests into forests of commercially potential value is very welcome. However, communities do express their fear and concern as regards to the possible change of government intention to revert back community forests into national forests. People need to be reassured.

10. Old growth forests of high biodiversity value is rapidly converted into almost monoculture agro-forestry of high economic value, and leasing out community forest area for private plantation of NTFP including big cardamom has raised new issues in resource management. Impact assessments on biodiversity of certain old growth forests should be mandatory before handing over the property to the community.

11. Nepal has a large network of religious forests and sacred woodlands. Their potential as a genebank of indigenous species and a refuse for birds and wildlife has not yet been appreciated. There is a need to inventory those properties in the light of heritage conservation and biodiversity enhancement.

12. The eighth and the ninth five year plan have re-orientated the forestry sector towards achieving the goal of poverty alleviation. The MPFS on the other hand conceptualize community forestry to be meant for fulfilling basic needs of a subsistence society. The opportunity to develop community and private forestry for sustainable development has become more and more apparent. There is a need to develop common understanding between and among the people and the government agencies to charter a course of development where forests will immensely contribute in sustainable development.

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