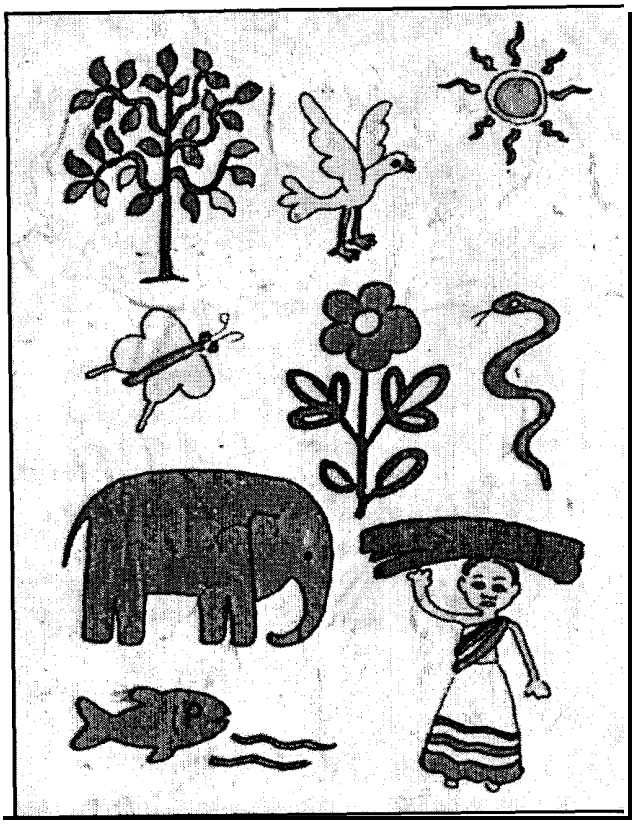
National Report
on Implementation of the Convention on Biological Diversity in
NEPAL



His Majesty's Government of Nepal
Ministry of Forests and Soil Conservation
Singhadurbar, Kathmandu

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Contents

Executive Summary

Nepal signed the Convention on Biological Diversity (CBD) during the Earth Summit in June 1992; ratified it in the fall of 1993; and it has entered into force since 21 February 1994. As a Party to the Convention, and as per its Article 26, this report has been prepared following the format as suggested in decision II/17.

Nepal, situated in the Central Himalaya, has diverse physiographic zones, climatic contrasts, and altitudinal variations. This provides habitats for biological species of both Indo-Malayan and Palaeoarctic realms, including endemic Himalayan flora and fauna. Wild species inhabit in about 54 percent of the surface area under some sort of vegetation cover. A total of 118 ecosystems with 75 vegetation types and 35 forest types have been identified in these realms. Phytogeographically, Nepal is also known to contain plant and animal species as found in various floristic sub-regions including Sino-Japanese, Irano-Turanian, Central Asiatic and Indo-Malayan floristic regions. In general, central Nepal is considered as a meeting point of several eastern and western species.

Nepal has only about 0.1 percent of the total land mass of the world while it harbors over 2 percent of flowering plants, 3 percent of pteridophytes, and 6 percent of bryophytes of the world's flora. In addition, about 5 percent (246 species) of the total flora reported are endemic which accounts to about 30 percent for whole of the Himalayan regions. Similarly, Nepal possesses over 4.2 and 8.5 percent of the total world's mammals and birds reported so far. Over 400 species of agro-horticultural crops are estimated available in Nepal. Of them, about 50 species have been domesticated for commercial and household consumption. At present, about 8,400 accession of cereals, grain legumes, oil seeds, vegetables, industrial crops and spices crops are stored.

Species conservation has been a part of livelihood of the Nepalese society due to its cultural and socio-economic importance as many of the species have religious value and are the source of food and proteins, Hence, importance of all life forms are clearly understood for environmental management and for their possible use for socio-economic development of the country in line with the intent and spirit of the Convention.

Because of intrinsic values of species, Nepal has given utmost importance for in situ and ex situ conservation of biological species, from the last two and half decades, through the establishment and/or strengthening of protected areas in representative ecological zones. The protected areas network totals about 15 percent of the total area of the country. Eight national parks, four wildlife reserves, one hunting reserve, and three conservation areas are legally protected. Species conservation has been ensured through policy and legal measures and program implementation with focus on benefit sharing, and empowerment to the local people. The National Conservation Strategy of 1988, Forestry Sector Master Plan 1989, Environmental Policy and Action Plan 1993, and Agriculture Perspective Plan 1996, including recent periodical plans are the major guiding policy instruments for preserving wildlife and forests, and agriculture species.

The Constitution of the Kingdom of Nepal 1990 also states the need for conserving rare animals species, the forests and the vegetation of the country. Under this broad framework, the Forest Act 1993, and the Forest Rules 1995, and the National Parks and Wildlife Conservation Act, 1973 (with amendments) contain provisions to empower the local people and revenue sharing mechanism which has significantly contributed to biodiversity

conservation with people's participation. These instruments are implemented by prioritizing human resources, establishing and/or strengthening institutions, ensuring inter-sectoral coordination, and encouraging and promoting the communities for implementing activities jointly or individually. Various programs are on-going for biodiversity conservation, preventing its further depletion, demonstrating effective approaches through community participation, and encouraging the replication of these approaches, and socio-economic upliftment of the people. To make them effective, reasonable amount of financial resources have been devoted to natural resource management.

Biodiversity is a resource for sustained use. The goal is to integrate biodiversity conservation with socio-economic development. While the purpose is to institutionalize an effective system for biodiversity conservation through the establishment and/or strengthening of habitats - both wild. and man-made, sustainable use of biological species for poverty alleviation, and involvement of the private sector and the NGOs for maintaining biological diversity. Within this framework, Nepal is preparing a National Biodiversity Action Plan as a component of the five year GEF-funded Biodiversity Conservation Project in order to streamline its efforts for species conservation, To date, major focus areas have been identified; existing initiatives and responsibilities have been analyzed; regional and technical workshops have been organized with the participation of different stakeholders; and case studies have been prepared. This plan will be completed by the end of April 1998. The National Biodiversity Action Plan considers sectors that influence the biodiversity, and the biological species that contributes to the development of different sectors will be adequately identified through sectoral analysis and establishment of the inter-linkages amongst the sectors. The Action Plan will reflect the cross-sectoral needs, refine priorities and develop investment proposal for implementing effective conservation programs. The Action Plan will recommend series of actions with emphasis on SW (why, when, where, who and how).

In spite of these various policy, legal and program interventions, some species are either threatened or vulnerable due to habitat loss or change in and outside the protected areas. Some of the current threats to biodiversity are related to loss of habitat or its alternation, over-exploitation of some commercial species, illegal hunting and poaching, over-grazing and fire, and increased commercial trade. In order to address these emerging concerns, community and leasehold forestry has been promoted; benefit sharing mechanism has been institutionalized legally; and an environment trust fund has been operated. Institutions are strengthened, and time-bound projects and annual programs are implemented considering communities, international and national NGOs as conservation partners. HMG has allocated development budget for the forestry and agriculture sector totaling about US$ 43 million for all types of activities during the fiscal year 1997/98 It is estimated that about 20 percent of the this budget may be used for administering biodiversity conservation.

Realizing the need for more fund to species conservation, a concept proposal for a 25 million US$ Biodiversity Trust Fund has been developed and submitted to the GEF/World Bank for consideration. Once the Action Plan is in place, details on programs, budget, schedules, monitoring and evaluation processes and indicators will also be in place.

Nepal has successfully launched community forestry programs all over the country, and buffer zone management activities adjacent to the protected areas. Our experience on species conservation and sustainable use has enabled us to re-think that conservation is for the people and the local people are to be involved right from the planning to

implementation and monitoring stages. This led Nepal to change its conservation policy from government-managed and protection-oriented regime to community-managed sustainable approach. People's enthusiasm is clearly reflected in this endeavor and this spirit is maintained through policy changes and amendment in the existing legislation in order to empower the local people in resource management, and revenue sharing. This efforts has significantly contributed to increase the number of protected wild animals, germplasm conservation, and resolve the park-people conflicts.

Current initiatives indicate hope for biodiversity conservation, sustainable use and sharing of benefits as stipulated in the objectives of the Convention. Unless species conservation provides a direct benefit to the rural people, it would be very difficult to attain goals of sustainable development. The goal can not be attained in isolation. What is needed is how to encourage and motivate the larger sector of the society in this endeavor.

Chapter One
Introduction

Nepal, situated in the Central Himalaya in between the arid Tibetan plateau in the north and fertile Gangetic plains to the south, is a small mountainous country with an area 147,181 km^2 lying in between $26^0 20'$ to $30^0 27'N$ and $80^0 4'$ to $88^0 12'E$. Nepal is also characterized by diverse physiographic zones, climatic contrasts, and altitudinal variations from about 75m to 8848 m (Roof of the world - the Mount Everest). She contains biological species of both Indo-Malayan and Palaeoarctic realms, including endemic Himalayan floral and fauna1 species.

The country has about 54 percent of the surface area under some sort of vegetation cover (forest area 37%, shrublands 5%, and grasslands 12%). Of the 193 biogeographic provinces recognized worldwide in Udvardy's classification, only three provinces are known to occur in Nepal. They are - Himalayan highlands within the Palaearctic realm, Indo-Ganges monsoon forests within the Indo-Malayan realm, and Bengalian rainforest representing the later realm. A total of 118 ecosystems with 75 vegetation types and 35 forest types have been identified in different physiographic zones in these realms. Out of this, 38 types of ecosystems are represented in protected areas network alone (national parks, wildlife reserves and conservation areas). Besides, larger number of deep valleys and the considerable vertical extension of the Nepal Himalaya has contributed to the formation of many isolated localities which may have favored for speciation over the years.

Phytogeographically, Nepal is also known to contain plant and animal species as found in various floristic sub-regions including Sino-Japanese, Irano-Turanian, Central Asiatic and Indo-Malayan floristic regions. In broader perspective and on the basis of vegetation and animal distribution, Nepal could be divided into western Nepal, Central Nepal, and Eastern Nepal. They could be further divided into several small units based on plant and animal distribution in different altitudes, their endemism and characteristics. In general, many of the biological species are recorded from central Nepal which may be attributed to the meeting point of several eastern and western species.

1. Importance

Traditional belief and use of certain parts of species for various purposes has been deeply rooted in Nepalese culture. Conservation of religious species has further been a part of the society. For several centuries, peepal tree (*Ficus religiosa*), banyan tree (*Ficus bengalensis*) parijat - Paradise jasmine (*Nyctanthes* arbortristis), and tulasi - basil *(Ocimum sanctum)* etc. are the sacred plants - deeply rooted in public life.

Biological species has been a part of subsistence living of majority'of the Nepalese people. It has also been an opportune to the local people to adjust their life with the nature. Biological species are invaluable and have of greater importance to the rural people since time immemorial. Still they are the major food stuffs, and a source of proteins. An estimation indicate that over 190 species *(43* percent of the recorded species) of wild plants are commonly used by the local people as food and fruits. Domesticated species have further importance to Nepalese society as majority of the people depend on agriculture and livestock raising. Hmalayan ecosystems provide a habitat to a number of very important species.

Plants purify air and/or balance oxygen and carbon dioxide ratio, protect soil and increase soil fertility, enrich the nutrient level and microbes decompose the dead bodies. They interact each other and maintain inter-dependence. Biological species have greater role in maintaining and/or improving the environmental quality against its degradation. They have both consumptive and nonconsumptive values and they are greatly realized in the national economy. Parts or whole body of the species, either plant or animals, are traditionally used for meeting the basic needs of the larger sector of the people. Plant parts are used for meeting the food stuffs, firewood, fodder, and timber requirements. While some parts of plants and animals are also used for medicinal purposes. About 700 species of plants, comprising of about 13.6 percent of Nepal's vascular plants, are known to contain medicinal properties. Bones, skin, animal furs and horns are used for medicines or decorative. Yarsa gumba (Cordyceps *sinensis)* is known to have aprodiasic properties and mountain people frequently use them. It has high market value. There are many more species having consumptive values traditionally used by the local people.

Preferred Plant Species for Trade and Legal Protection

Of over 100 plant species in trade, only 5 species are traded for all (five) physiographic zones of Nepal. They are; *Acorus calamus* (Bojho), *Picrorhiza kurroa* (Kutki), *Rheum emodi* (Padamchal), *Swertia chirayito* (Chiraito), and *Valeriana wallichii* (Sugandawal). Ten species of plants and their components are collected exceeding 100 tons of volume. They are; *Bergenia ligulata* (Pakhanbed), Cinnamomum *tamala* (Tejpat), *Cinnamomum zeylanicum* (Dalchini), *Juniperus sp.* (Dhupi), *Nardostachys jatamansi* (jatamansi), *Pinus roxburghii* (Khote salla), *Sapindus mukorossi* (Rittha), *Shorea robusta* (sal), Swertia *chirayita* (Chiraito), and *Zanthoxylum armatum* (Timur). Estimates indicate the possible local loss of ten species of highly valued timber, six species of fibre, six species of edible fruit trees, four species of medicinal herbs and some 50 species of little known trees and shrubs for ever if the remaining tropical humid forests were to lose.

The Forest Rules 1995, enforced as per the Forest Act 1993, has categorized number of medicinal herbs and non-timber plants or the timber species with non-timber use parts for legal trade. Forty three species are listed to be licensed for their root collection; 20 species for bark; 31 species for leaves; 24 species for flower and fur; 65 species for fruit and seeds; 12 species for whole plants; 10 species for resin, gums and lac; and other 29 herbs for whole or parts of the plants.

Because of increasing volume of trade of highly valued species and their possible loss, His Majesty's Government of Nepal has prohibited collection, utilization, sale and distribution, transportation and export of *Cordyceps sinensis,* and *Orchis latifolia.* While *Nardostachys valeriana, Rauwolfia serpentina, Cinnamomum glaucescens, Valeriana wallichii,* lichens, silajit (rock exudate), *Abies spectabilis,* and *Taxus wallichiana* are banned for export except processed in the country and export permission issued by the Department of Plant Resources. Tree species namely *Michelia champaca, Acacia catechu,* and *Shorea robusta* are prohibited for transportation, export and cutting (felling). This legal provision has contributed to the conservation of vulnerable wild plant species.

Biological species have multifold benefits to the people residing in the rural areas. Medicinal herbs are the basis for Ayurvedic therapy and Himalayan herbs are considered to contain high quality of medicinal values and they are used by modern pharmaceutical multinational companies. Accordingly, trade of these plants, both non-timber forest plants (NTFPs) and non-timber use of timber species, are increasing day by day. There is an apparent increase in trade of NTFPs since the last six years (1989/90 to 1995/96), corresponding to the increase in revenue from US$ 0.6 million to about 8 million. Export demand for NTFPs are increasing, and over 97 percent is exported to India.

Most Favored Wildlife Species
Wild animals are illegally hunted, poached or trapped. Mammals and birds are killed with guns, snares, poisoned arrows; fishes are either trapped or captured with nets or exploited through temporary darns, poisoning, electric shocks or dynamites. Wildlife and its specimens are in comrmrcial use in national and international market. The sloth bear and Himalayan bear is hunted or poached for its gall bladder; rhino for horn, musk deer for musk, and tiger and leopards for skin and bones. Increased prices of wildlife products in the international market encouraged their illegal hunting, poaching, collection, and trade. Illegal hunting and poaching of wild animals have increased in the recent years, in particular since 1988. Tiger hunting, snake and tortoise trade are frequently noticed in Nepal's commercial market. Sixty three rhinos were either illegally hunted or poached during the last two decades. With due consideration of this situation, HMG has legally protected 26 spedes of mammals, 9 spedes of birds and 3 species of reptiles in order to increase their number and maintain genetic diversity (Annex 2).

Non-consumptive values of the biological resources are also greatly acknowleded and eco-tourism has been introduced. This has significantly increased the revenue. The protected areas have generated revenue of about US$ 1.2 million in 1996. It was made possible through the non-consumptive values of biological species - the eco-tourism. Comparing the investment and revenue generated in all the protected area systems, over US$ 0.25 million has been estimated to be the surplus for the same year. Besides, it has helped to maintain livelihood of the local people by providing the forest products and cash flows in the rural areas.

2 National Commitment on CBD

Nepal understands the role and importance of all life forms for environmental management and for their possible use for socio-economic development of the country. Its sustainable use would be instrumental in improving the living standard of the people. Its multi-fold benefits prompted Nepal to be a Party to various legally-binding international instruments such as Ramsar Convention, CITES, ITTO, Plant Protection Agreement, Conventions on Clirmte Change, Desertification and Biological Diversity. After this, conservation of biological

diversity in Nepal is not only a national priority it is also a global commitment. However, there is a need for developing mechanisms for sustainable use of biological resources so that Nepal can be in a position to allocate adequate funding for biodiversity protection and be able to attain the goals of sustainable development.

Nepal signed the Convention on Biological Diversity (CBD) during the Earth Summit in Rio de Jeneiro on 12 June 1992, and ratified it in the fall of 1993. The Convention has entered into force since 21 February 1994. Major focus of the Convention on the need for *conservation of biological species, sustainable use of its components, and the fair and equitable sharing of the* benefits as its objectives are the convincing elements to Nepal for its ratification. There are also other relevant provisions for strengthening species conservation, and various activities are to be implemented to meet the international obligations which in turn would contribute to conserve Nepal's biodiversity.

Unlike other Conventions, Biodiversity Convention calls on Parties to protect the species and to utilize them at sustainable basis for their socio-economic development. This approach will substantially contribute to poverty alleviation - one of the major factors to the loss of biological species in this economically poor but biologically rich country.

From the last two and half decades, Nepal has given utmost importance for in *situ* conservation of biological species through the establishment of protected areas in representative ecological zones. At present, eight national parks, four wildlife reserves, one hunting reserve, and three conservation areas which totals to about 15 percent of the total area of the country are legally protected. While *ex situ* conservation is ensured in a zoo and a botanical garden located in the Kathmandu Valley. Attempts are underway to prepare the National Biodiversity Action Plan (NBAP), research and exploration activities, implementation of the cost and benefit sharing mechanisms in the protected area systems, public awareness and information exchange activities.

Biodiversity conservation is also ensured outside the protected areas in particular the government-managed (national) forests and the farm land. The present policy of handing over the parts of national forests to the community forest user groups has been instrumental in conserving biological species in mixed forests. The forests - locally called community forests are also serving as the gene pool for indigenous plant and animal species as the local people themselves prepare operational forest management plan and protect the endangered and/or threatened plants and animals found within these areas.

3. National Biodiversity Action Plan

As per Article 6 of the Convention, Nepal is integrating biodiversity conservation in national policies and programs. As a first step, a National ***Biodiversity Action Plan*** is under preparation with due consideration to various provisions as contained in the Convention on Biological Diversity. Action plan preparation is on-going as one of the immediate objectives of a five year CEF-funded Biodiversity Conservation Project. To date, major focus areas have been identified; existing initiatives and responsibilities have been analyzed; regional workshops have been organized with the participation of different stakeholders; and case studies have been prepared. This plan will be completed by the end of April 1998. During the preparation of the NBAP, efforts are made to utilize and build on existing efforts to ensure successful completion of the plan.

The National Biodiversity Action Plan considers sectors that influence the biodiversity, and the biological species that contribute to the development of different sectors will be

adequately identified through sectoral analysis and establishment of the inter-linkages amongst the sectors. The Action Plan will reflect the cross-sectoral needs and open avenue for program implementation and amendment to policy and legal mechanisms as appropriate. Efforts are also underway to refine priorities and develop investment proposal for implementing effective conservation programs. It is hoped that it contributes to attain the objectives as stipulated in the Convention and the goals of sustainable development.

National Biodiversity Action Plan Preparation in Progress

With the objectives of providing a systermtic and strategic approach; and providing specific priority programs and actions by recognizing existing initiatives and responsibilities, and identifying needs and constraints for biodiversity conservation, the National Biodiversity Action Plan Project - a component of the CEF-funded Biodiversity Conservation Project is under preparation by the HMG in collaboration with Resou rces Nepal - a self-governing private organization. It will be prepared by the end of April 1998. It will provide a comprehensive strategy for coordination of various stakeholders of biodiversity including wildlife, forestry, tourism, agriculture, and communities at large to implement the prioritized conservation needs of the country.

The Project has so far completed the tasks of reviewing the conservation-related policies and plans, institutional framework including the status and trends of Nepal's biodiversity. It convened five regional and one national-level workshops with participation of different stakeholders of biodiversity. Technical workshops have been organized on plant resources, protected areas, wetlands, community forestry, agriculture biodiversity, and livestock genetics in order to prioritize the projects and programs, and identify issues of national and local concerns.

The Project has identified few high priority areas deserving conservation. They are: Mai Valley, Koshi Barrage and Milke Danda (forest) in the Eastern Nepal, Pulchoki forest in the Central Nepal and Ghodaghodi Tal (lake) in the Western Nepal. Few more areas may be identified from West Nepal in due course of time. The Project is in a process of developing a plan to determine implementional strategies, resource allocation including the implementation programs on evaluation and monitoring. The Action Plan will also contain initiatives with direct alternative actions and policies for the maintenance of biodiversity within and outside the .protected areas with the inclusion of short - and long-term "profile projects" to address initiatives- and strengthen human resource development, institutional capacity, and to provide incentive programs in order to foster biodiversity conservation in Nepal.

The Project has identified some endemic livestock such as Achhame and Lulu cow having <200 and <250 population respectively. Similarly, two species of buffaloes (Parkote and Lime), five species of goats and sheeps (Sinhal, Bhyanglung, Baruwal, Kage and Lampuchhre) and two species of pigs (Chawnche and Hurrah) are recorded endemic livestock with low number of population, never reported before. It is hoped that the findings and recommendations of the Action Plan Project will re-direct and re-emphasize biodiversity conservation initiatives in Nepal.

Chapter Two
Background

Nepal's biodiversity resources are managed through people's participation. Various forestry and agriculture related policies, including the Forestry Sector Master Plan and Agriculture Perspective Plan, focus on the preparation and implementation of operational plans to conserve biological species, both wild and domesticated.

1. Biotic Assets

Nepal has only about 0.1 percent of the total land mass of the world while it harbors over 2 percent of flowering plants, 3 percent of pteridophytes, and 6 percent of bryophytes of the world's flora. In addition, about 5 percent (246 species) of the total flora reported are endemic to the country. The endemic species accounts to about 30 percent for whole of the Himalayan regions or distribution of these endemic species is limited only to the Himalayas. Similarly, Nepal possesses over 4.2 and 8.5 percent of the total world's mammals and birds reported so far respectively (Annex 1). Based on the current number of species, Nepal could be considered as a meeting point of several floral and fauna1 species because of her altitudinal and climatic variations

Nepal's climatic variations in agro-ecological zones favors for crop and animal diversity as well. Over 400 species of agro-horticultural crops are estimated to be available in Nepal. In case of vegetables, it comes down to only about 200 species. Of them, about 50 species have been domesticated for commercial and household consumption. There are many fruit species which still grow in wild habitats. Seasonal fruits harvested from forests belong to about 37 genera and 45 species. In case of potato, about 11 species are known local varieties. Present level of exploration indicatem that the eastern Nepal is richer in germplasm than the western Nepal which may be attributed to climatic conditions as the former receives more rainfall than the latter.

There are more than 100 varieties of 15 major fruits, 200 varieties of 50 vegetables and about 10 varieties of potato under commercial cultivation. There are many horticulture species with ecotypes *in* Nepal which are not cultivated for their economic value. For example, two species of chestnut are known to occur in Nepal. Many of the un-exploited group of plants can be directly brought to cultivation and/or can be used as genetic source for particular desirable trait(s). Some of the wild genotypes have been identified and domesticated for economic value by the local people through their own experience and wisdom.

Nepal Agriculture Research Council (NARC) has stored germplasms of various crops - cereals, grain legumes, oil seeds, vegetables, industrial crops and spices crops and it totals to about 8,400 accession. For rice crop, there are about 680 accessions and 713 for finger millet.

Albeit species conservation has been given utmost importance since time immemorial, population growth and inadequate knowledge on the importance of biological species resulted in their loss before knowing their economic and biological values. Prior to the 1950s, over 50 percent of the area was forested and significant number of wildlife population was noticed. It encouraged the hu nters to collect fur, skin and meat in order to meet their growing demand. In addition, a large tract of Terai matured forests was converted to agriculture land after successful program of malaria eradication. Loss of habitat and hunting dramatically

reduced wildlife population in most parts of Nepal. While in the agriculture biodiversity, selection of species for cultivation promoted the use of only high-yielding and resistant species.

Various developmental activities have resulted in either depletion of forest cover or loss of area or reduced the population of biological spedes. The adverse effects of human interventions on biodiversity are increasing dramatically and threatening the very existence of different wild spedes. The rate of extent of alternation of the environment, and the resultant consequences on the distribution, density, and frequency of species or the ecological systems were severe in the Terai and the Middle Mountains.

Possible Extinction of Local Animal Species

In Nepal, unregulated hunting, illegal poaching, consumption of forest products, and conversion of wild habitats to farm land etc. are responsible to the loss of several wild species without knowing their medicinal and intrinsic values for socioeconomic benefits..

The Biodiversity Profile Project 1995, an undertaking of HMG with the assistance of the Government of the Netherlands, published the Red Data Book of the Fauna of Nepal containing information on wild species which are threatened with local extinction. It revealed that some 56 species of mammals (31 percent), 226 species of bird (27 percent), 25 species of reptiles (25 percent), 9 species of amphibians (21 percent), 35 species of fishes (19 percent), and 142 spedes of butterflies (22 percent) of the total reported species are vulnerable through habitat destruction. Three species of mamrmls namely *Sus salvanicus* (pigmy hog), *Moschiola meminna* (Indian chevrotain) and *Acionomyx jubatus* (cheetah) are believed extinct from Nepal. In addition, eleven species of birds are also considered extinct over the last century. Similarly, the habitats for 200 species of birds, 10 species of mammals and 20 species of reptiles and amphibians are believed severely affected. This scenario clearly reflects the disturbance to habitat - forest ecosystems of wild anirmls.

2. Legal and Policy Framework

With due realization of the need for socio-economic development, trends on species utilization and its intrinsic value, socio-cultural and ecological setting and other factors, HMG and people individually or jointly undertook various measures for species management. Nepal recognized the need for conserving biological diversity for both present and future generation right from the beginning of the development planning exercise which started in the mid-fifties with the launching of the First Five Year Plan (1956-'61). Regulated hunting of the wild mammals were in practice till the 1970s. Forest resources were considered as a major source of national revenue until the Fifth Plan (1975-'80). Timber selling and forest clearance for different purposes including the resettlement of the poor hill people were stopped by the early 1980s. This resulted in habitat degradation of wild animals and depletion of forest resources. It prompted the government to declare a part of the forest area as national parks and/or wildlife reserves to provide good habitat for large wild animals.

Biodiversity conservation policy has been deeply linked with the forest and agriculture policies. Policy focus on forest management has been re-directed toward community participation after the mid-seventies. Accordingly, emphasis was also given to develop and manage conservation areas, rather than the national parks and wildlife reserves, by involving the individuals, communities and the NGOs in species management. Accordingly, Nepal visualized the need for a trust fund to share benefits accrued from protected areas network.It materialized as a deliberate policy intervention in the Eighth Plan (1992-'97) formulated after the reinstatement of democracy in 1990. Hence, Nepal's species conservation approaches have been shifted from central to local level.

In Nepal's biodiversity conservation movement, people are considered as the main focus of benefit sharing, as the poor rural people are more dependent on this resource for subsistence living. The policy framework has also focused on the preparation of operational management plan for species conservation with people's participation. At present, local people are also considered as guardian decision-makers and the ultimate beneficiaries of conservation measures.

The current policies focus on result oriented research and studies on flora and fauna and their sustainable use for generating more income and employment opportunities for the rural farmers. Within the broad framework of conserving biological diversity, and promoting natural habitats, the relevant policies calls for the involvement of individuals, communities and non-governmental organizations (NGOs); and strengthen their capacities. Besides, there is a growing concern reflected on the need for preserving the endemic and endangered species and their habitats.

The Constitution of the Kingdom of Nepal 1990 states that the State *shall* give *priority* attention to the *conservation of the environment.... and also make special arrangement for the conservation of rare animals species, the forests and the vegetation of* the *country* [Article 26 (4)].

Prior to the instatement of democracy in 1950, species protection was ensured through *sanad* or *order* as wildlife remain intact in large tract of forests. Several precautionary measures were taken to conserve sal (*Shorea robusta),* sissoo (*Dalbergia sissoo),* satisal (*Dalbergia latifolia*), bijayasal (*Pterocarpus marsupium*), and khayer *(Acacia catechu)* etc. in the Terai. The Muluki Ain (National Code) of 1853 contains provisions of penalty to those involved in cutting trees of roadside, and around water sources. An interesting commitment made in the Muluki Ain is that trees of Mahabharat forests and corridor of elephant (*Elephas maximus*) and rhinoceros *(Rhinoceros unicornis)* should not be cut down. In other areas, only old trees could be selectively felled with permission. These initiatives are the entry point to species conservation in Nepal. However, the forest areas were used for different purposes and habitat destruction started. In order to address these concerns, several legal provisions came into existence along with population growth and initiation of the planned economic development.

In 1957, HMG enacted *Wildlife (Conservation) Act* for the conservation of wildlife and to regulate hunting by repealing all previous *sawal, sanad, tok sadar, and tok tipots* issued for this purpose. As wildlife population began declining, and habitat disturbed, HMG realized the need for declaring certain areas as protected areas for the conservation of wildlife and their habitat. Accordingly, the *National Parks and Wildlife Conservation Act 1973* was enacted by repealing the previous Act.

Policy Shift on Biodiversity Conservation
Economic development planning in Nepal started in mid-fifties focused on developing policies for conservation and utilization of forests and its components. Since the mid-sixties, the periodical policy emphasized on the need for strengthening wildlife conservation, scientific forests management following the working plans, need for survey, production and/or commercial farming and processing of herbs by encouraging NGOs. Since the 1980s, concern on biodiversity conservation and/or 'protection of forests and rare wildlife was clearly reflected in the periodical policies. Realization of the need for increasing community participation for forest management, and establishing national parks ultimately led to the policy formulation for introducing eco-tourism in order to promote economic benefits. Emergence of environmental problems in greater magnitude recognized the need for formulating national environmental policy and gave adequate attention on environmental aspects while implementing development activities. The Eighth Plan (1992-'97) focused on developing national parks, wildlife reserves and conservation areas for ensuring biodiversity conservation and promotion of natural sites. It also focussed on the involvement of individuals, communities and NGOs in forest development and management and formulatation of practical rules for the utilization of forest products, mobilization of Royal Nepal Army in protecting forests in sensitive areas, establishment of a trust fund to share benefits accrued from protected areas network, and involvement of local people in managing conservation areas. The National Conservation Strategy of 1988 has timely re-emphasized on the need for preserving wildlife and forest vegetation, protecting Churiya Hills and adjoining Bhabar - ecologically vulnerable areas, ensuring conservation of threatened areas and protecting land containing genetic diversity, establishing protected areas for the conservation of rare or endangered species, protecting genetic diversity and/or essential wildlife habit, initiating inventory, cultivation and harvesting of medicinal plants and minor forest products. A 21 year Forestry Sector Master Plan, endorsed by HMG in 1989, focused on the conservation of ecosystems and genetic resources. Nepal's Environmental Policy and Action Plan of 1993 realized the need for strengthening institutional capacity, declare conservation areas for adequate representation of Nepal's major ecosystems, involve local people in the management of parks and reserves, preserve endemic and endangered species and their habitat, promote private and public institutions for biological resource inventory and conservation, improve forest management by encouraging people's participation, minimize adverse environmental impacts of development projects, ensure that major watershed are adequately protected. These policy directions have prompted different stakeholders to re-emphasize on biodiversity conservation.

The Forest *Act 1993*, and the *Forest Rules 1995*, enacted for ensuring the development and conservation and proper utilization of forest resources through people's participation,

contains provisions to prepare operational plans for the management of all types of forests. The **Act** also empowers the government to declare any part of national forests as a protected area if it has environmental, scientific and cultural significance. The Act has been effective in listing some species of plants to protected category.

The Plant Protection *Act 1973* regulates export and import of plant and plant products while the *Aquatic Life Protection Act, 1961* empowers government to punish any person involved in using poisonous, noxious or explosive materials into the water bodies or destroying any dam, bridge or water system with intent to catch or kill aquatic life. The Soil and *Water* Conservation *Act, 1982* empowers the government to declare any part as a protected watershed area with a view to introduce land use activities. The *Water Resources Act, 1992* and the *Electricity Act, 1992* focus on the inclusion of species requiring conservation in the environmental study.

Policy **and Legislations** Relatedto Biodiversity Conservation‘
Aquatic Life Protection Act, 1961
National Parks and Wildlife Conservation Act, 1973
Plant Protection Act 1973
Soil and Water Conservation Act, 1982
King Mahendra Trust for Natu re Conservation Act, 1982
National Conservation Strategy, 1988
Master Plan for Forestry Sector, 1988
Water Resources Act, 1992
Electricity Act, 1992
Forest Act, 1993
Environmental Policy and Action Plan, 1993
Agriculture Perspective Plan, 1996

Conservation policies and legislation are effectively enforced in Nepal’s 8 national parks, 4 wildlife reserves, 1 hunting reserve and 3 conservation areas and forest area covering all 75 districts. Regarding domesticated plant and animal species, various programs are implemented by the district Agriculture and Livestock Offices all over the country through policy formulation.

3. Conservation Capacity

Biodiversity is an asset for development. It deserves conservation for the attainment of long-term goals. For this, trained manpower is a key to implement conservation measures. Realizing its role and contribution to national economy and in maintaining the ecological balance, HMG has given priority attention to human resource development. Accordingly, officials are given opportunity for advanced studies, and specialized training. Community groups are made aware and trained and NGOs are developing skills for working together

with the local people. At present, it is estimated that over 1,200 experts are involved in research and management of biological species, both wild and domesticated species. In addition, significant number of middle level technicians are involved in this venture.

Species conservation is a multi-sectoral activity and requires integrated approach. Not a single agency would be effective enough in this Herculean task. Hence, various institutions have to be involved in order to ensure its conservation and management. In accordance with this realization HMG has established various institutions to translate policy commitments into action with joint efforts, as appropriate but with differentiated responsibilities.

At present, the Ministry of Forests and Soil Conservation with its four departments (Departments of Forests, National Parks and Wildlife Conservation, Plant Resources, and Soil Conservation) and with a Forest Research and Survey Centre is involved in the conservation of, and research on biological species in the wild habitat. The former department administers conservation activities in all parts of the country while specialized departments work in prescribed areas. With regard to agriculture diversity, the Ministry of Agriculture with its two departments (Departments of Agriculture, and Livestock) and with Nepal Agriculture Research Council (NARC) is made responsible for species management, both plants and animals. In addition, the Ministry of Population and Environment, established in September 1995, is also made responsible to formulate policies and programs and maintain environmental conservation areas, having high biodiversity or areas containing species of national significance, in order to contribute to the conservation and management of biological species. The Ministry also attempts to oversee the inter-linkages between the environment-related conventions and agreements to which Nepal is a Party. These government institutions are directly involved in policy formulation, program design and implementation, species exploration, research, conservation, management and sustainable use of biological species.

For inter-sectoral coordination at implementation level, a 16-member National Biodiversity Steering Committee has been established in July 1997 under the chairmanship of the Secretary of the Ministry of Forests and Soil Conservation. The Committee comprises of representatives from the forestry organizations, Ministry of Agriculture, Ministry of Population and Environment, and two international NGOs - the IUCN and the WWF and a national NGO - the Nepal Forum of Environmental Journalists. This Committee oversees the implementation of the CBD in Nepal.. The National Biodiversity Unit, housed in the Ministry of Forests and Soil Conservation, serves as the secretariat of the Committee.

For higher level of coordination, Environment Protection Council, chaired by the Rt. Honourable Prime Minister has been established in accordance with the provision of the Environment Protection Act 1997. The Council is mandated to coordinate all activities related to environment management, in which biodiversity is also one of the major component. Hon'ble Ministers of the relevant ministries, key national and international NGOs and experts are the members of this Council.

Over five thousands and three hundreds forestry user groups are also institutionally involved in community forestry management in different parts of the country, mostly in hilly region. These are the local people involved organizations who have been successful in species conservation in the designated areas. Recently, a Federation of Community Forestry Users is also in place to strengthen empowerment of the local people in this endeavor.

4. On-going Activities

Various project level activities are implemented jointly or individually by the government agencies and/or non-governmental organizations, both national and international organizations. Though very few activities have focused biodiversity conservation, most of the forestry and agriculture activities have contributed to species conservation. Notable on-going activities include, *inter alia,* exploration and research, identification of various ecosystems, preparation of operational and/or management plans, and implementation of conservation awareness programs, habitat development, launching afforestation and simple protection measures for promoting natural regeneration in the forests. In the areas of agriculture biodiversity, efforts are underway on germplasm collection and the operation of a gene bank, research and development of new hybrids and genetic study.

His Majesty's Government is implementing a three-years Park and People Project with the assistance of the United Nations Development Program since 1994 in Terai's two National Parks and three Wildlife Reserves with the twin objectives of biodiversity conservation and socio-economic upliftment of the people residing adjacent to the protected areas. Two types of distinct activities - within and outside the protected areas are identified. Grassland management, habitat improvement, orphan animal management, wetland improvement etc. are implemented within the park whereas community development, income generation, conservation education and awareness, community forestry development and eco-tourism are the prioritized activities outside the protected areas. User group concept has been introduced for program implementation, and about 300 such groups are formed by the end of June 1997 in different settlements. The groups have generated over US$ thirty thousands community capital by the end of June 1997 through village saving schemes; of which 95 percent has already been invested in different income generation programs.

- A five years GEF-funded project - Biodiversity Conservation in Nepal has been implemented since 1994 with the objectives of conserving existing biodiversity, preventing its further depletion, demonstrating effective approaches through community participation, and encouraging the replication of these approaches throughout and outside Nepal, as appropriate. Under this project, a National Biodiversity Action Plan is in the process of preparation, and its selected activities will be implemented; biodiversity conservation activities has been implemented in the Makalu-Barun National Parks and Conservation Area - to protect few of the remaining pristine forests in the sub-tropical through high transect of the Eastern Himalaya – a global biodiversity hot spot; and national capacity will be enhanced to protect and manage biodiversity. This project also focuses on empowering the local people in the conservation and management of different life forms through meeting their basic needs.
- A Dutch-funded Biodiversity Profile Project, 1995 assessed the present state of biodiversity conservation in Nepal, both inside and outside the protected areas; to identify, *infer* alia, gaps, the needs and future conservation priorities, including investment needs in the protected area.
- HMG has also been implementing the Buffer Zone Management Programs as a prioritized activity adjacent to the protected areas. Under this activity, buffer zones are delineated and are in a process of declaration as per the provisions contained in the Buffer Zone Management Rules, 1996. The zones will be developed and managed by the communities and several community development activities will be implemented by the communities themselves in order to least damage the park resources while meeting the basic needs of forest products. Besides Black Buck Conservation Project, Musk Deer Research Project and

Ghadial Conservation Project are also implemented for species conservation requiring immediate attention. Similarly, over 15 community forestry development projects are implemented in different parts of the country in order to strengthen community forestry and conserve species meriting protection.

In agriculture sector, various activities on germplasm exploration and monitoring of genetic erosion, crop improvement and seed research, development of high yielding varieties etc. are on-going.

- A WWF-funded Bardiya Integrated Conservation Project has been implemented in the Royal Bardiya National Park with the objectives of developing the Park, conserving its biodiversity, and improving the living standards of the local people residing near the park through the implementation of community development programs. The project will concentrate on the improvement of park management, ecological research, and the development and implementation of resource management plan, and monitoring. A Northern Mountains Conservation Project is also under implementation in order to conserve the Trans-Himalayan unique ecosystems and its components. At present, anti-poaching activities are launched extensively through identifying informants and developing a cadre of green volunteers.
- The King Mahendra Trust for Nature Conservation (KMTNC) - a national NGO is managing a conservation area of over 7000 km2 in Western Nepal. The following box presents an overview of the efforts of the NGO in species conservation.

NGO Initiative for *In Situ* and&x *Situ* Species Conservation
The King Mahendra Trust for Nature Conservation (KMTNC), established in 1982 as an autonomous, non-profit and non-governmental organization in accordance with the King *Mahendra* Trust for *Nature Conservation Act, 1982* has successfully launched over 60 projects in the field of nature and biodiversity conservation, and sustainable ru ral development. With the mission of conservation, promotion and management of wildlife and other natural resources, the Trust has launched Annapurna Conservation Area Project (over 7000 km^2 area), since 1986, and has developed the area as a model for integrating people's participation in natural resources management by improving the living standard of the local people. The Trust is also involved in *ex situ* conservation of biological species. HMG entrusted the management of a Central Zoo - only one zoo in Nepal, and the Trust has prepared and implemented a management plan for its improvement. At present (1995), the Central Zoo contains a total of SOS wildlife. There are 230 marnrmls of 31 species, 240 birds of 53 species, and 35 reptiles of 16 species. Of them there 67 mamrmls, 14 birds and 10 reptiles which are considered as vulnerable in their wild habitats. Notably, Rhinxeros *unicornis* (rhinoceros), *Panthera* tigris (tiger), *Bos gaurus* (Gaur bison), *Antilope cervicarpa* (Black buck), *Macaca mulatta* (Asamese monkey), *Hyaena hyaena* (Hyaena), *Manis pantadactyla* (Pangolin) and *Lynx lynx* (links) are the endangered mamrmls. *Lophophorus impejanus* (Impeyan pheasant), and *Grus grus* (Common crane) are protected birds while *Gavialis gangeticus* (Gharial), *Python molurus* (Python) and *Varanus flavescens* (Monitor lizard) are the rep tiles of the same category. The zoo has been promoted as an education centre of excellence for *ex* situ conservation of endangered wildlife, and has planned to increase their population, without changing the genetic constituents.

Nepal's forest management has been possible through the introduction of community forestry program as the main component of the Master Plan for Forestry Sector. At present, community forestry user groups has been a viable and most effective community based organization for species management.

Significant amount of financial resources have been diverted to natural resource management. However, it is difficult to divert the significant percentage of the national revenue to biodiversity conservation unless it returns back to improve the socio-economic conditions of the local people. Hence, it is essential to introduce sustainable use concept, as per the objective of the Convention, in order to show people's contribution in species conservation to national development.

5. Public Awareness

People are both the beneficiaries and victims of any environmental changes. Loss of biodiversity may have significant impact on local people as many of them depend on both wild and domesticated species for subsistence living. Hence, public awareness is a major component of the conservation efforts in Nepal. Almost all the projects have launched public awareness programs in order to convince and/or remind the local people on the importance of biological species.

Governmental and non-governmental organizations jointly or individually have also launched training programs on methods to survey and identify species, and its management aspects.

Chapter Three
Goals and Objectives

HMG has formulated policies and programs, and enacted and/or amended rules and regulation to support benefit sharing by the local people. This arrangement has motivated different stakeholders to be involved and participated in biodiversity conservation. Biodiversity is a resource for sustainable use. The goal is to integrate biodiversity conservation in socio-economic development sector. In order to contribute to achieve this goal, efforts are underway to decentralize the management aspects, empower the local community and develop mechanisms for developing a feeling of ownership of each activity. The government agencies will only play a catalytic role, carryout research and promote capacity building and information sharing, and promote the use of appropriate technologies and focus on demand-driven programs. Within this broad framework, the purpose is to institutionalize an effective system for biodiversity conservation through the establishment and/or strengthening of habitats - both wild and man-made, sustainable use of biological species for poverty alleviation, and involvement of the private sector and the NGOs for maintaining biological diversity.

Biodiversity conservation is deeply rooted in Nepalese culture. Local people are involved traditionally in the development, conservation, management and utilization of biological species. In fact, it has been a life of the local people as they depend on various species to meet their firewood, fodder, timber, medicines and food requirements.

As a party to various Conventions related to species conservation, Nepal understands the importance for, and its national obligations of conserving the biological species. In accordance with this, various policies, programs and activities are tuned involving larger sector of the community. The long-term target is to maintain the habitat that contains higher number of species in the wild state in all ecological zones (Terai to Himalayas); conserve germplasm of agriculture crops and animals; and ensure participation of the local communities in species conservation and management. Emphasis is also given to strengthen institutions, develop human resources and capacity building to meet the above objectives. Policy focus on sustainable utilization of biological species and sharing of benefits are yet to be translated into actions. Through this effort, the local people and different stakeholders will be self-motivated for species conservation.

Chapter Four
Strategy

HMG has adopted various conservation strategies relevant to species management. Most of them are rather concerned with protection aspect. Realizing the drawback of central management system in resource management, recent strategies are re-directed to people's empowerment through benefit sharing mechanisms.

1. Issues and Gaps Identification

In spite of various policy and programs on species conservation, some species are either threatened or vulnerable due to habitat loss or change outside the protected areas. While in the protected areas, increased number of wild animals have to survive in limited areas experiencing ecological succession. Stringent protection measures in the protected areas have significantly contributed to the increase in population of several wild animals and plants but the ecological succession has reduced the habitat required by a specific endangered wild animal. The designated protected area has not been increased, grasslands are converted to woody vegetation and there is a competition for shelter and food inside the park. Palatable foods are available in the farm land, closed to the park. It encouraged several protected wild animals such as the rhinos to visit frequently the farm land and the poor people are suffering from either crop and livestock damage or demolition of houses. Similarly, the park is also experiencing an extreme pressure from local people due to high demand of forest resources, emerging the problem of park-people conflict. This situation is also prevalent outside the protected areas.

Some of the current threats to biodiversity are related to the loss of habitat or its alternation, over-exploitation of some commercial species, illegal hunting and poaching, over-grazing and fire, and increased commercial trade. There may be many more factors to the loss of biodiversity which have been intensified from:

- increasing demand of biodiversity products for the increased human and livestock population;
- inadequate consideration for integrating biodiversity conservation in economic development planning;
- inadequate enforcement of legal provisions to curb the trend of species loss without any knowledge on their economic value, and lack of mechanism to utilize them at sustainable basis for poverty alleviation;
- inadequate involvement of different stakeholders for biodiversity conservation;
- inadequate adjustment on economic markets to value the biodiversity;
- inadequate regulation of international trade of biological products of the threatened and rare species.

These underlying causes have not only intensified the loss of biodiversity but also limited their future use for sustainable economic development. It has been so due to conversion of some 0.2 million hectares of humid tropical forests to farm land, and degmdation of some 0.02 ha of subclimax forests in the Hills with an average annual deforestation rate of 1.3 percent in the past. However, the deforestation rate has been substantially reduced and it is estimated, at present, to be around 0.5 percent per annum. It also resulted to the fragmentation and

degradation of habitats, conversion of natural habitats to other uses, over-exploitation of wild species, introduction of exotic species or extinction or over-growth of species from environmental changes occurred from pollution of soil, water, and atmosphere.

Benefits are only seen on timber, fuelwood and fodder and trade of wildlife specimens. Its non-consumptive values have not been significant in many of the protected areas. This has limited even to decision-makers and policy-makers to be self convinced for allocating fund for species conservation.

2. Adopted Strategies

In order to fill the gap, various policies and activities are in place. Translation of policy commitments into actions is not so easy task in the field because of lack of adequate financial resources. Major policy breakthrough is related to sharing of benefits accrued from species conservation. Local people are encouraged to form the user groups, prepare and implement operational plans and share the benefits as agreed in the plan. Initial results of the expansion of community forestry and buffer zone management around the protected areas have shown that people-centred activities do work effectively if the benefit sharing mechanisms are in place. This mechanism will be promoted in order to bring the larger sector of the community in the main stream of biodiversity conservation. Specifically, the following strategies are adopted for species conservation in Nepal.

- Community and leasehold forestry has been promoted. Parts of the government managed forests will be handed over to the community user groups and the economically marginalized people to help them meet the demand of forest products without damaging the species habitat.
- Benefit sharing mechanism has been institutionalized legally. People residing nearby the protected areas have been promoted to form the user groups and the revenue generated from the areas will be handed over for community development. The ultimate focus of this mechanism is to ensure species conservation while meeting the basic needs of the local people.
- An environment trust fund has been operated in accordance with the provision of the Environment Protection Act, 1997 and a separate biodiversity trust fund is also planned to operate to help facilitate the conservation of species, both wild and domesticated species.

Few of these initial strategies will open the avenue for species conservation more effectively. More strategies may be recommended by the National Biodiversity Action Plan which will be implemented in due course of time in order to ensure the conservation of biological species.

Chapter Five
Partners

Biodiversity conservation is a multi-sectoral and multi-agency responsibility as different life forms are important for environment conservation. In Nepal, rural communities are promoted for species conservation. At present, two distinct areas of biodiversity - the wild variety in the forests and domesticated species in the farm are dealt by two separate entities. The Ministry of Forests and Soil Conservation is actively involved in species conservation and management in the wild habitat while the Ministry of Agriculture is made a responsible agency to conserve and develop agriculture biodiversity.

With regard to agriculture biodiversity, HMG organizations such as the Department of Agriculture, Department of Livestock and the Nepal Agriculture Research Council (NARC) are actively involved in species development, conservation and management. As most of the Nepalese people depend on agriculture for subsistence living, they are also involved in the conservation of genetic resources. However, the growing population has compelled the local people to cultivate and develop only high yielding and resistant species.

At present, the Ministry of Population and Environment is also involved in developing and in assisting the formulation of policies which support species conservation. HMG is implementing various conservation activities with donor assistance, including the United Nations organizations.

1. Communities

Community forestry development program has been a major breakthrough in species conservation. About six thousand forestry user groups, recognized by the forestry legislation, are directly involved in managing the forests and the biological species in over 0.4 million ha of national forests. This program has benefited over 0.6 million households of Nepal. Over six thousands user groups have been strengthened. They are the major viable partners of the government to conserve biological species in community forests. The Federation of Community Forest Users is involved in mobilizing and facilitating the local people to strengthen community forests.

Local people, in particular the rural poor, are encouraged to participate in leasehold forests and buffer zones management. Women user groups are promoted in watershed management activities. Communities are the major conservation partners whose strength would be an effective vehicle for the conservation of all life forms.

2. International NGOs

In Nepal's efforts of wild species conservation, three international NGOs are actively involved. They are: The World Conservation Union - IUCN, the World Wildlife Fund - WWF, and The Mountain Institute - TMI. The former NGO is basically involved in research and data base generation while the other two are implementing field based conservation activities in different protected areas.

Other several INGOs are integrating biodiversity conservation as a component of resource management and community development.

The International Centre of Integrated Mountain Development (ICIMOD) - an inter-governmental body is also involved in research and information sharing on the Himalayan biodiversity among its member countries.

3. National NGOs

Various non-governmental organizations are involved in raising public awareness on the importance and value of biological species. NGOs have encouraged not only to the public to act for species conservation but also promoted private sectors to invest some of the parts of their earnings on plantation and species management. Few business men are involved in managing the leasehold forests, and/or developing orchard with input on the conservation of selected species. However, substantial progress has not been made in attracting the private and business sector in investing for biodiversity conservation.

National NGOs such as King Mahendra Trust for Nature Conservation (KMTNC) is actively involved in biodiversity conservation. It aimed to link species management with community development in the Annapurna Conservation Area and other protected areas. The Project has implemented a number of activities including micro-hydropower generation in order to reduce pressure on forests for firewood. Field based activities of several local level NGOs are also moving in right direction to involve the people in species management.

Chapter Six
Action

Importance of biodiversity conservation is realized at the local and national level by different stakeholders. Various activities have been effectively implemented and on the top of that various actions are repeatedly proposed. HMG implements annual programs on biodiversity conservation based on the severity of the problem. Four time-bound projects are currently implemented in protected areas network. They are Park and People Project, Biodiversity Conservation Project, Bardiya Integrated Conservation Project, and Northern Mountains Conservation Project.

HMG/Ministry of Forests and Soil Conservation is preparing a Land Resource Management Project with focus on community forestry, national forests management, watershed management and biodiversity conservation. The project component also include the preparation of the concept paper for biodiversity trust fund.

The Biodiversity Profiles Project 1996 which is also a precursor to the preparation of a biodiversity action plan has listed 97 projects relevant to biodiversity conservation. They are grouped on action research, expansion on protected areas, improvement of protected area management, studies, institutional strengthening, extension and training, income generation and community development with the budget estimation of over USS 39 million.

The National Biodiversity Action Plan will recommend series of actions with emphasis on *SW* (why, when, where, who and how). Some of the previous studies have recommended to implement some priority projects and actions which could contribute to biodiversity conservation. They are: forest multiple value and income generation project, rhododendron conservation program, strengthening anti-poaching activities and CITES implementation, assessment of biological values, and area and species specific conservation programs etc.

In general, the HMG Departments implement activities within and outside the protected areas and the buffer zones. They conduct plant exploration activities, research, technology development etc. with their partners. Research activities are also carried out by the Institute of Forestry and Agriculture individually or jointly with INGOs and national NGOs.

Chapter Seven
Schedule

For the time-bound projects, activities are scheduled and they are implemented accordingly. In case of annual programs, each activity is designed during August to October and are implemented within the middle of July of the next year. The biodiversity action plan is under preparation, and activities are yet to be prioritized. Unless the Action Plan is in place, it is difficult to schedule the activities.

Most of the activities listed in chapter six are recommended for implementation within 2000 AD except for follow-up and monitoring actions required.

Chapter Eight
Budget

Unless the species conservation program has a direct input for improving the national economy, it is difficult to convince the decision-makers and to allocate substantial amount of financial resources. However, biodiversity conservation in some of the protected areas has shown substantial generation of the national revenue and there is a positive sign to allocate required amount of financial resources to this purpose.

The Convention has stipulated three main categories of resources for financial support. They are: fund provided at the national level, fund provided through bilateral and multilateral donors, and fund provided through financial mechanism.

A separate budget for biodiversity conservation alone is difficult to find out in the present procedure of budget allocation. His Majesty's Government has allocated development budget for the forestry and agriculture sector totaling about US$ 43 million for all types of activities for the fiscal year 1997/98. The budget is about 8 percent of the total development budget. The budget for the forestry sector is about US$ 8 million. It is estimated that about 20 percent of this budget could be used for administering biodiversity conservation.

Most of the donor agencies, assisting in the green sector, include biodiversity conservation as a component of the project. The budget is also included in the annual budget program and it is difficult to separate the actual amount of budget for species conservation. Regarding the time-bound projects, two projects with 1.3 million USS UNDP-funded Parks and People Project and 1.7 million US$ WWF-funded Bardiya Integrated Biodiversity Conservation are under implementation besides the regular HMG funding activities.

Although GEF is an interim financial mechanism for the implementation of the Convention's provision, Nepal has received only 3.8 million US$ for a five years Biodiversity Conservation Project and 0.1 million USS for Land Resources Management project within the period of three years (1994-'97).

Recently, a concept proposal for a 25 million US$ Biodiversity Trust Fund has been developed and it is forwarded to the GEF/World Bank for consideration.

Chapter Nine
Monitoring and Evaluation

The National Biodiversity Action Plan will recommend monitoring and evaluation processes and indicators in order to see the changes on biodiversity during the implementation of the action plan. At present, the Ministry of Forests and Soil Conservation and the Ministry of Agriculture have the Monitoring and Evaluation Divisions in order to monitor the effectiveness of the programs. In addition, the National Planning Commission Secretariat has also established a similar division to review the status of program implementation.

Several departments have their own units for performance monitoring. A biodiversity assessment program is on-going to identify the assessment methodologies, including monitoring and evaluation.

At present, Nepal is rather focusing its activities on exploration of plant species and counting of wild animals especially for protected species. Performance monitoring has been the integral part of program implementation without much work on developing biodiversity monitoring indicators. Recently, a study is on-going to identify indicators and to develop methodologies for biodiversity monitoring activities.

Chapter Ten
Sharing of National Experience

Biodiversity conservation is largely a people-oriented program in Nepal. Albeit, biodiversity conservation has not been able to influence national economy, the current level of financing and program implementation open avenue for species conservation.

After the implementation of eight periodical plans and sectoral policies and programs, with integrated approach, Nepal has had the experience that stringent protection regime does not effectively work at the grass-root level unless they are tied up with provisions for meeting the basic needs of the local people as they are heavily dependent on natural resource base for subsistence living. Our experience on species conservation and sustainable use has enabled us to re-think that conservation is for the people and people are to be involved right from the planning stage for biodiversity conservation. This led Nepal to change its conservation policy from government-managed and protection-oriented to community-managed sustainable approach.

The Convention has rightly recognized the special role of indigenous people and local communities in the conservation and sustainable use of biodiversity. Analogous with the spirit and intent of the Convention, as stated in Article 8(j), Nepal has made amendment in the existing forestry legislation to empower the people for resource management and benefit sharing. Interestingly, with the support of the Park and People Project aimed for resolving the park-people conflict, under implementation in Terai's two national parks and three wildlife reserves, local people have resolved, to some extent, the problem of crop damage from the protected wild animals within a very short time. The user groups decided to construct a trench between the park boundary and the crop land with full enthusiasm and zeal. They constructed 2.5 km long trench and have planned to extend it to 5 km. After the construction of the trench, the frequency of wild animals visit, in particular the rhinos, to the crop land has been noted reduced to about 70 percent. Local people have also planted *Opuntia* species as a fence to protect the land from crop raiding animals which is also extremely effective for crop protection. These few examples of community participation and application of indigenous knowledge calls for re-thinking and re-directing policy and programs for species conservation and improvement of the living standard of the people.

Policy enunciation, in particular the Eighth Plan (1992-'97) and the Master Plan for Forestry Sector viewed people as the key player for resource management if it should be sustainable, effective and socially acceptable. To this endeavor, relevant legislation such as Forest Act and Rules, National Parks and Wildlife Conservation Act, and Buffer Zone Management Rules and Conservation Area Management Rules, and Environment Protection Act and Rules are enacted and/or amended with special provision for community empowerment for resource management, provision for the transfer of government rights to the forest user groups, and benefit sharing in the protected areas, and special provision for additional facility to processes and technologies which help to conserve the environment.

The forest user groups are not only enjoying direct and indirect benefits of forest management but also providing habitat for larger number of wild animals. The successful program on community forestry management prompted Nepal to introduce participatory watershed management approach and buffer zone management through cost and revenue sharing concept. These initiatives are largely contributing *to* species conservation.

The following box provides some of the successful achievements made so far from community participation in forest management which are very impressive and replicable in areas where people have once suffered for meeting the demand of forest products. Similarly, Nepal is convinced that population of the endangered wild animals could be significantly increased through commitments and untiring efforts with people's participation.

Empowering the Local People as Guardians of **Biodiversity**

Enforcement of the Private Forests Nationalization Act in 1957 led to Nepal's forest as an open access resource, resulting to the tragedy *of the commons*. HMG, realizing the conditions of the forests and wild biological species, re-directed its policies for institutionalizing community forests in the mid-seventies. Community forestry has been implemented as a prioritized activity since 1978 to empower the local people in the development, conservation, management and sustainable use of forest resources and its components. During the last decade (1987 to May 1996), about 0.4 million ha of national government-managed forests have been handed over to the local user groups in the form of community forests which accounts to about 11 percent of the potential community forests (3.355 million ha and it is about 61 percent of the total forest area of Nepal - 5.5 million ha). From this process, about six thousands user groups have been formed and about 0.6 million households have benefited.

Handing over of the national forests has substantially increased after the enforcement of the Forest Act, 1993 and the Forest Rules, 1995. The forestry legislation do not limit the area of community forests to be handed over, legally empowers the local user groups to utilize surplus fund for any community development works, and pricing of forestry products are decided by the users themselves, and operational plans are developed and implemented by the users unlike several restriction made in the previous legislation.

Community forestry has ensured biodiversity conservation in the prescribed areas. Almost all the forest operational plans have duly recognized the importance of endangered biological species and certain protection measures are decided by the users. Albeit, biodiversity monitoring has not been in practice in the community forests, the present level of information revealed that species conservation is the primary focus of the local people.

Community forests have also become a major source of earning in the rural areas. For example, a 75 ha area of community forestry managed by 142 households with a five years operational plan (1994-'99) was handed over to the forest user group in May 1993 in Central mid-hill of Nepal. A 15 member Forest User Group (FUG) Committee with its users have managed the riverine sal (*Shorea robusta*) forests. The FUG has earned over three thousand US $ (1$ = NRs. 63) by March 1997 from grant, sale of forest products, penalty and fines, application fees and prizes. During the same period, about 2,600 US $ has been utilized for community development works, in particular the drinking water, irrigation and renovation of temples and maintenance of public places. The Group has still a bank balance of over US$ 500.

Though it is a small amount, it has self-motivated the local people to make a change in the forest conditions through community efforts. This phenomenon has been tremendously replicated in several parts of middle hills and it would be, in near future, a viable and most effective option for biodiversity conservation in Nepal.

Remarkable Increase on Rhino Population

Continuous and untiring efforts of His Majesty's Government (HMG) and her partners in implementing conservation measures intensively has demonstrated the significant increase of the population of the protected wildlife. Current estimates indicated tiger population within the range of 150 to 200; wild 'buffalo 100 to 120; black buck 100 to 110; *Bos gauros* - a minimum of 190; and wild elephant 40 to 50. Hundred and six tigers are reported from Royal Chitwan National Parks alone (Preliminary tiger count, 1995). In addition, over 450 crocodiles - legally protected species, have been released in three major rivers - Koshi, Karnali and Narayani rivers of Nepal.

HMG launched a count rhino program in June 1994. This program, an undertakings of the Department of National Parks and Wildlife Conservation, HMG in collaboration with three non-governmental organizations - the King Mahendra Trust for Nature Conservation, WWF - Nepal Program and Resources Nepal, confirmed the population increase of rhinoceros (Rhinoceros unicornis) from 60 to 80 in the late sixties to 446-466 numbers with an annual rate of increase by 3.76 percent in Nepal's first protected area - the Royal Chitwan National Park (RCNP) established in 1973 in the central Terai. The park, listed as the World Heritage site and a representative ecosystem of the Indo-Malayan biogeographic realms, at present, may have provided habitat to over 500 rhinos.

Rhino count was performed from 7 repeated and 35 single surveys using 11-15 elephants for 50 days (March 2 to April 19, 1994) totaling to 2800 elephant hours for rhinos searching. The survey found the afternoon search comparatively productive to the morning search. The study revealed the calf/adult to female ratio of 79:100. The Rhinos in the RCNP prefer the grassland, riverine forests and sal forests with its population of 63, 26.5 and 5 percent respectively. As the Park is close to large settlement, all rhinos were observed within an average of 3.5 km from the nearest village.

Since the establishment of RCNP, one hundred nine rhinos had died due to natural death (80 percent) and poaching (20 percent). On an average, 5 animals died from natural deaths, 4 from poaching and 2 from tiger predation. This encouraging number of protected wild animal has motivated the agencies to strengthen efforts for species conservation.

Conflict Resolution Through Benefit Sharing

Eight national parks, four wildlife reserves, one hunting reserve and three conservation areas have ensured *in-situ* conservation of biological diversity in over 15 percent of the total area of the cou ntry. Various programs are found effective for conserving the habitat and in increasing the number of endangered, threatened and vulnerable wildlife inclu ding the legally protected species. It has been made possible through untiring efforts of the government with its conservation partners - both international and national NGOs and the commu nity at large.

Despite the impressive coverage of the protected area system in Nepal, there are increasing conflicts between the park management and the local people, particularly in extracting the forest resource to meet the daily requirements of the later group; and agriculture and livestock depredation from the protected wild animals.

In order to address this issue, HMC amended the National Parks and Wildlife Conservation Act, 1973 in June 1993 with the provision of declaring the buffer zone in order to provide forest products to the local people at regular basis. The Act also introduced the concept of revenue sharing and clearly spelled out that thirty to fifty percent of the total revenue generated in the protected areas will be used for community development activities in order to promote local people's participation in the park management - ultimately biodiversity conservation. This amount will be used as decided by the commu nity - the user groups. Accordingly, a Buffer Zone Management Rules, 1996 is also in place. This concept also prompted Nepal to strengthen eco-tou rism in the protected areas.

Introduction of eco-tou rism activities in the protected areas have been found very effective for revenu e raising. For example, the Royal Chitwan National Park has been a destination to number of tourists visiting Nepal. They enjoy the sub-tropical climate and view the onehorned rhinoceros away from about 10-15 metres inside the park

Situated some 165 km south from the capital - Kathmandu, the park was visited by some 59 thousands tourists in the fiscal year 1993/95 with the total revenue of about US$ 270 thousands. Number of tou rists has increased to 96 thousands in 1996/97 with the total income of over US$ 300 thousands. This exemplifies the need for promoting eco-tou rism to generate fu nds not only for park management but also for commu nity development in areas adjoining to the park These recent initiatives are hoped to attain the goals of biodiversity conservation through people's effective participation in the protected areas of Nepal.

These examples clearly indicate the hope for biodiversity conservation, sustainable use and sharing of benefits as stipulated in the objectives of the Convention. Unless species conservation provides a direct benefit to the rural people, it would be very difficult to attain the goals of conserving the species. The goal can not be attained in isolation. What is needed is how to encourage and motivate the larger sector of the society in this endeavor.

Annex 1

Nepal's Share in Species Diversity

(In number)

Groups	Biological Species		*Nepal's share (%)*	Endemic sp.
	World	Nepal		
Plant Croup				
Algae	> ***40,000***	***687***	***1.72***	***13***
Fungi	> 70,000	1670	2.38	NA
Lichen	> 17,000	465	2.77	52
Bryophytes	> 14,000	853	6.09	NA
Pteridophytes	> 12,000	383	3.19	77
Flowering plants (Angiosperm + gymnospers)	> 250,000	5175	2.07	246
Animal Group				
Non-arthropods	>90,000			
Arthropods insects	>1,000,000	5,052	0.44	4
Butterfly		645		29
Other than insects	>190,000	144*		108
Fresh water fishes	>85,000	185	0.21	8
Herpetofauna				
Amphibians	>4,000	43	1.07	9
Reptiles	>6,500	100	1.53	2
Birds	>9,881	847	8.57	2
Mammals	>4,327	185	4.27	1

Note: . Spiders only

Threatened Species			
S.N.	Animal Groups	World	Nepal
1	Mammals	741	28
2	Birds	970	22
3	Reptiles	316	9
4	Amphibians	169)	-
5	Fishes	979	
6	Invertebrates	2,754	2
	Total	5,929	61

Annex 2

Protected Wildlife under the National Parks and Wildlife Conservation Act, 1973 including Their Status				
Scientific Name	Local Name	Common Name	Status	
			IUCN	CITES
Mammals				
(Sus salvanius)	Sano bandel	Pigmy hog	EXN	I
Ailurus fulgens	Habre	Red panda		I
Antilope cervicapra	Krishnasar	Black buck	V	III (NP)
Bos gaurus	Gor budson	Gaur bison	V	I
Bos mutus	Yok nak	Wild yak	E	I
Bubalus arnee	Arna	Wild water buffalo	E	III (NP)
Canis lupus	Bwanso	Grey wolf	V	I
Caprolagus hispidus	Hispid kharayo	Hispid hare	E	I
Cervus duvauceli	Barasinghe	Swamp deer	E	I
Elephas maximus	Jangali hatti	Asiatic elephant	E	I
Felis lynx	Lynx	Lynx	E	II
Hyaena hyaena	Hundar	Striped hyaena	E	
Macaca assamensis	Asamese rato bander	Assamese monkey		II
Manis crassicaudata	Salak	Indian pangolin		II
Manis pentadactyla	Salak	Chinese pangolin		II
Moschus chrysogaster	Kasturi mriga	Himalayan forest musk deer	E	I
Ovis ammon	Nayan	Great Tibetan sheep	I	I
Panthera tigris	Bagh	Bengal tiger	E	I
Panthera uncia	Hiun chituwa	Snow leopard	E	I
Pantholops hodgsoni	Chiru	Tibetan antelope		I
Pardofelis nebulosa	Dwanshe chituwa	Clouded leopard	V	I
Platanista gangetica	Sauns	Gangetic dolphin	V	I
Prionailurus bengalensis	Chari bagh	Leopard cat		II
Prionodon pardicolor	Lingsang	Spotted lingsang		I
Rhinoceros unicornis	Gainda	One-horned rhinoceros	E	I
Tetracerus quadricornis	Chauk	Four-horned antelope		III (NP)
Ursus arctos	Himali rato bhalu	Brown bear		I

continued .....

Birds				
Buceros bicornis	Thulo dhanesh	Great-horned hombill		I
Catreus wallichii	Cheer	Cheer pheasant	E	I
Ciconia ciconia	Seto stork	White stork		II
Ciconia nigra	Kalo stork	Black stork		II
Grus grus	Saras	Common crane		
Houbaropsis bengalensis	Khar mujur	Bengal florican	E	I
Lophophorus impejanus	Danfe	Impeyan pheasant		I
Svoheotides indica	Sano khar mujur	Lessor florican		II
Tragopan satyra	Mona1	Crimsom-homed pheasant		III (NP)
Reptiles				
Gavialis gangeticus	Ghadial gohi	Gharial	E	I
Python molurus	Azingar	Asiatic rock python	V	I
Varanus flavescens	Sun qohori	Golden monitor lizard	I	I II

Note : Common name Pangolin refers for two *Manis* species, as suggested by Biodiversity Profiles Project, 1996.

Annex 3

Chronology of Major Events on Bfodiversity Convention	
12 June 1992	Convention on Biological Diversity signed
14 ***September 1993***	Convention ratified by the House of Representatives (Parliament)
21 November 1993	Instruments deposited to the Depository
21 ***February 1994***	Convention entered into Force
September 1994	Five-year GEF-funded Biodiversity Conservation Project started
November 1994	One-year Dutch-funded Biodiversity Profile Project started
August 1994	Three-years Park and People Project started
April 1995	Forest Act, 1993 enforced
April 1995	Forest Rules, 1995 enforced
March 1996	Buffer ***Zone*** Management Rules, 1996 enforced
December 1996	Conservation Area Management Rules, 1996 enforced
10 ***June 1997***	Environment Protection Act, 1997 enforced
12 ***June 1997***	Environment Protection Rules, 1997 enforced
1997	Nepal's Flora Implementation Project started
1997	Land Resource Management Project formulation started
March 1997	Establishment of the National Biodiversity Unit in the Ministry of Forests and Soil Conservation
16 ***July 1997***	Formation of the National Biodiversity Steering Committee
September 1997	Establishment of the Environment Protection Council, chaired by the Rt. Hon'ble Prime Minister as a legal entity
21 November 1997	First Meeting of the National Biodiversity Steering Committee