This is to certify that the

dissertation entitled

CONSERVATION STRATEGIES OF NEPAL, 1951-1985

presented by

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has been accepted towards fulfillment
of the requirements for

MASTER degree in Agricultural & Extension Education

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Date 11-9-84

CONSERVATION STRATEGIES OF NEPAL, 1951-1985

By

Ukesh Raj Bhuju

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Approved by ... J. Franklin Bobbitt ...

Department of Agricultural and Extension Education

1984

ABSTRACT

CONSERVATION STRATEGIES OF NEPAL, 1951-1985

By

Ukesh Raj Bhuju

The purpose of the study was to describe and analyze conservation strategies advocated by H'G in the national development plans during 1951-85. The strategies, i.e., objectives, priority, budget, organization, technical areas for emphasis, people's participation, and legislation, were chronologically reviewed and compared for each plan period.

Conservation was one of the sectors in the plans during the period 1951-85. Its strategies during 1950s and 1960s were inclined towards government control and people's participation in implementation. During 1970s, the strategies were modified with an appreciation of conservation through the preventive technical measures and the mutual cooperation between government and the people.

By the turn of 1980s, conservation was upgraded to the top priority national program supported with appropriate legislation so that people could participate at all levels.

Conservation as an integral part of development should be envisaged in other developmental works along with the support through organization, legislation, and people's participation.

ACKNOWLEDGEMENTS

The author is indebted to the Food and Agriculture Organization of the United Nations for providing him the fellowship to study leading towards the Masters of Science in Agricultural and Extension Education with emphasis in conservation education extension at Michigan State University (MSU). He wishes to express his gratitude to His Majesty's Government of Nepal for the nomination and grant of study leave for the same purpose.

The author wishes to express his sincere appreciations to Dr. Otis Donald Meaders, and Dr. Frank Bobbitt for their guidance and help during the entire study. He also wishes to express his sincere thanks to Dr. Melvin R. Koelling and Dr. Fred J. Peabody for their counsel and advice throughout the study.

The staff of the Media Lab and Computer Access Center, College of Education at MSU cooperated by providing a wordprocessor and graphic lab facilities. The staff of the MSU Library helped to locate the materials. The staff of the Department of Agricultural and Extension Education of MSU provided study room and other facilities.

Norma Roller of the Environmental Research Institute of Michigan provided specimens of satellite imageries for duplication. Brother Dinesh Raj Bhuju, colleague Bijay Kattel, and the staff of CFDP and WMCEP in Kathmandu cooperated by mailing documents and other information.

Dr. Rex and Glenna Ray, and Roger Steele helped in editing the thesis. Colleagues Sudhir Vikram Gurung, Narayan Kaji Shrestha, Consuelo Quiroz and others cooperated by giving valuable suggestions during the study.

The author derived ideas and informations presented by other authors whose names appear in the bibliography.

To all of them, and many others, the author wishes to extend his warmest thanks. Finally and with cordially, he thanks his wife, Byoma Bhuju, for her presence and help during the stay at MSU.

The ideas and informations presented in this study are the personal views of the author and not of HMG or FAO. These may be used by complete citation.

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November 6, 1984

TABLE OF CONTENTS

Chapter

Chapter

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CBS	Central Bureau of Statistics, Nepal
CCF	Chief Conservator of Forests
CEDA	Center for Economic Development and Administration
CFDP	Community Forestry Development Project
DF	Department of Forests
DSCWM	Department of Soil Conservation and Watershed Management
DSWC	Department of Soil and Water Conservation
FAO	Food and Agriculture Organization of the UN
HMG	His Majesty's Government of Nepal
ICIMOD	International Center for Integrated Mountain Development
IRD	Integrated Rural Development
IUCN	International Union for Conservation of Nature
MAB	Man and the Biosphere
MF	Ministry of Forests
MFSC	Ministry of Forests and Soil Conservation
MSU	Michigan State University
NCWA	Nepal Council for World Affairs
NPC	National Planning Commission
NPCl	National Planning Council
PF	Panchayat Forests
PPF	Panchayat Protected Forests

RCNAS	Research Center for Nepal and Asian Studies
RCUP	Resource Conservation and Utilization Project
SATA	Swiss Association for Technical Assistance
TCN	Timber Corporation of Nepal
TU	Tribhuvan University
UN	United Nations
UNEP	United Nations Environmental Program
UNESCO	United Nations Economic, Scientific and Cultural Organization
US	United States (of America)
USA	United States of America
USAID	United States Assistance for International Development
WMCEP	Watershed Management and Conservation Education Project
WWF	World Wildlife Fund

LIST OF SYMBOLS

	Degree	C	Degree Centigrade
ha	Hectare	kg	Kilogram
km	Kilometer	mm	Millimeter
'	Minute	m	Meter
#	Number	%	Percentage
sq km	Square kilometer	Rs.	Rupees (Nepali Currency)

CHAPTER I

INTRODUCTION

Statement of the Problem

From time immemorial the Nepalese people have depended on the country's natural resources such as soil, water and forests for their livelihood. At present, they face a serious problem regarding these resources. The natural environment of the country has been depleted at an alarming rate in the last three decades. This has resulted because of deforestation that has caused soil erosion. Deforestation also has created a scarcity of firewood and fodder. It indirectly has affected the natural springs causing them to dry up in the dry season and the mountain slopes to slide down in the rainy season. Soil erosion is the result of deforestation, heavy grazing and unscientific cultivation in the already fragile mountain ecosystem. The consequences are decreases in the carrying capacity of the grazing lands, decreases in productivity of soil, and increases in siltation of the waterbodies both natural and man-made.

Since the beginning of the new era in 1951, the government has enacted several Acts and Rules pertaining to the conservation of natural resources in Nepal. The application of aerial photography, satellite imagery and the computer also have been introduced. Nepal has experienced six national development plans, and all six have

included conservation programs. Several donor agencies e.g. FAO, UNDP, USAID, SATA, etc. have also supported the conservation efforts in Nepal. But, the natural environment of the country has been depleted at an alarming rate form 1951 to 1984.

Why has the environment deteriorated in spite of the earnest efforts made in conservation ?. To this question, there may be many answers. One answer would include the conservation strategies which govern the conservation programs. The conservation programs of Nepal are financed and controlled by and/or through His Majesty's Government (HMG). The strategies of conservation programs are governed by HMG.

Purpose

The purpose of the study was to describe and analyze conservation strategies of Nepal that have been advocated by HMG in the period between 1951-1985. The conservation strategies refer to objectives, priority, budget, organization, technical areas for emphasis, people's participation and legislation in the conservation programs launched by and/or through HMG.

Research Questions

The study attempted to answer the following questions:

1. What were the conservation strategies recommended in the individual national development plans of Nepal during 1951-1985 ?
2. What changes in conservation strategies occurred in the individual national development plans during 1951-1985 ?

Importance

Conservation of the natural resources in Nepal has become an urgent task for providing firewood and fodder because these are two

basic needs of the nation's people. The declining productivity of the soil must be reversed. If this can be accomplished, the nation's food will be sufficient like it was in the 1960s. Another imposing problem that must be solved is erosion and its hazards which threaten the lives and properties of the people. Conservation strategies play a major role in the challenging task of conserving the natural resources. Hence, a clear understanding of conservation strategies is important.

The historical review of conservation strategies during the period 1951-1985 will help reveal what changes took place in this period. The review will reveal the picture of conservation efforts during this period. The expectations of HMG in conservation of the natural resources may be more apparent.

The study will be helpful to the development planners and policy makers of Nepal. Knowledge of the past and its relationship to present conditions is required to formulate new and effective programs. This study will attempt to add new ideas to the knowledge-base of the conservation strategies.

The study can be helpful to the donor agencies which contribute to the conservation efforts of Nepal. Although the donor agencies contribute, the conservation strategies are governed by HMG and the conservation programs are controlled by HMG.

It is assumed that there will be further research questions after the completion of this study. But even with its limitations, this study will be useful to the conservation researchers in Nepal. The fact is that this field of study has yet to be exhaustively explored through scientific research.

Another important contribution of the study will be to the people of Nepal. It is expected that the study will help them to understand and interpret the conservation strategies which directly or indirectly affect their daily lives.

The information gathered in this study can be helpful to carry out similar studies in other desciplines of study. Other countries may find this study can be of benefit to them.

Procedure

The study included a review of six national development plans from 1956 to 1985, and one pre-plan period of 1951 to 1956. For each of the seven periods, the study included a description of conservation strategies on the following pattern: 1. objectives, 2. priority, 3. budget, 4. organization, 5. technical areas for emphasis, 6. people's participation, and 7. legislation.

The specific description of each period was as follows:

1. Objectives: The overall national objectives as mentioned in the development plans, which reflect the importance of the natural resources.
2. Priority: The level of priority given to the conservation programs among other development programs in the development plans.
3. Budget: The amount and percentage (%) of the total budget allocated for the conservation programs in the development plans.
4. Organization: The organizational structure of HMG body which is responsible for the implementation of the conservation programs.

5. Technical Areas for Emphasis: The conservation activities to be performed in the conservation programs during the national development plan focussing on the following areas:

i) Reforestation	(hectares)
ii) Forest Management	(activities)
iii) Watershed Management	(activities)
iv) Wildlife Management	(activities)
v) Extension Service	(activities)
vi) Survey	(field)
vii) Research	(activities)
viii) Training	(persons)

6. People's Participation: The level of people's participation in conservation programs.

7. Legislation: The Acts and the Rules enacted by HMG during the period and their main ideas.

Graphically the description and analysis of conservation strategy was carried out according to the format as shown in Table 1.

Table 1. Format of the Study

Periods / Strategies	1951-1956 Pre-Plan	1956-1961 First Plan	1961-1965 Second Plan	1965-1970 Third Plan	1970-1975 Fourth Plan	1975-1980 Fifth Plan	1980-1985 Sixth Plan
1. Objectives							
2. Priority							
3. Budget							
4. Organization							
5. Technical Areas for Emphasis							
i) Reforestation							
ii) Forest Management							
iii) Watershed Management							
iv) Wildlife Management							
v) Extension							
vi) Survey							
vii) Research							
viii) Training							
6. People's Participation							
7. Legislation							

Following the descriptions of the strategies for each period, an analysis was made to find out the changes from one period to another.

Consequently, the changes from one decade to another were revealed such as from 1950s to 1960s and to 1970s and 1980s as well. The numerical data on budget, reforestation and training have been illustrated in grapphic or tabular forms.

Definitions of Terms

Budget: The amount of money made available for conservation programs in the national development plans.

Conservation Program: A project or scheme or combination of projects and schemes related to conservation of the natural resources; incorporated into the national development plans.

His Majesty's Government (HMG): The present-day constitutional government of Nepal; also refers to the Government of Nepal, as it was formally called before April 14, 1958 (Agrawal, 1976:196).

Legislation: The Acts and the Rules pertinent to conservation of the natural resources, and enacted by HMG.

National Development Plan: A five-year or three-year systematic development plan approved by HMG.

Objectives: The long-term goals of the national development plans.

Organization: The administrative and functional structures of HMG which are responsible for the conservation programs.

People's Participation: People's involvement in conservation programs at various levels such as decision making, implementing, evaluating, benefit sharing, and maintaining.

Priority: A preferential rating of development programs in the national development plans.

Technical Areas for Emphasis: The activities in conservation programs such as: Reforestation, Forest Management, Watershed Management,

Wildlife Management, Extension, Survey, Research, and Training.

Sources of Information

The sources of information for this study were limited to those which met the following three criteria:

1. Official government reports, plans, or other documents.
2. Research reports or articles based on research which pertained to the general area of the study and authored by government officials, or authorized by the government.
3. Publications with dates starting from 1951 and ending in 1984.

Two of the major kinds of sources of information were the several government plans, usually five or three-year plans and the annual reports or the other official reports. Publications from other sources were used to help establish the credibility of the information contained in the government reports.

Limitations

The study was limited to the description and analysis, in terms of plans and changes from one period to another, in conservation strategies. It does not purport to evaluate the conservation programs launched by and/or through HMG during the period 1951-1985.

The study did not attempt to establish a "cause-effect" relationship between conservation strategies and conservation programs. The researcher hopes the study added some new ideas to the knowledge-base of the conservation strategies of Nepal.

The study did not also cover the strategies advocated by various international agencies involved in conservation of Nepal.

CHAPTER II

REVIEW OF LITERATURE

Environment of Nepal

Location, Area and Shape of Nepal

Nepal is located between 26°22' and 30°27' North latitudes and 80° 04' and 88° 12' East longitudes. It occupies an area of 147,181 sq km in the mid-Himalayan range in South Asia. It has a rectangular shape with the average east west length of 885 km. and the north-south width varying from 145 to 241 km. It is landlocked by China to the north and by India to the east, south and west (CBS, 1982:1-2) (Figure 1).

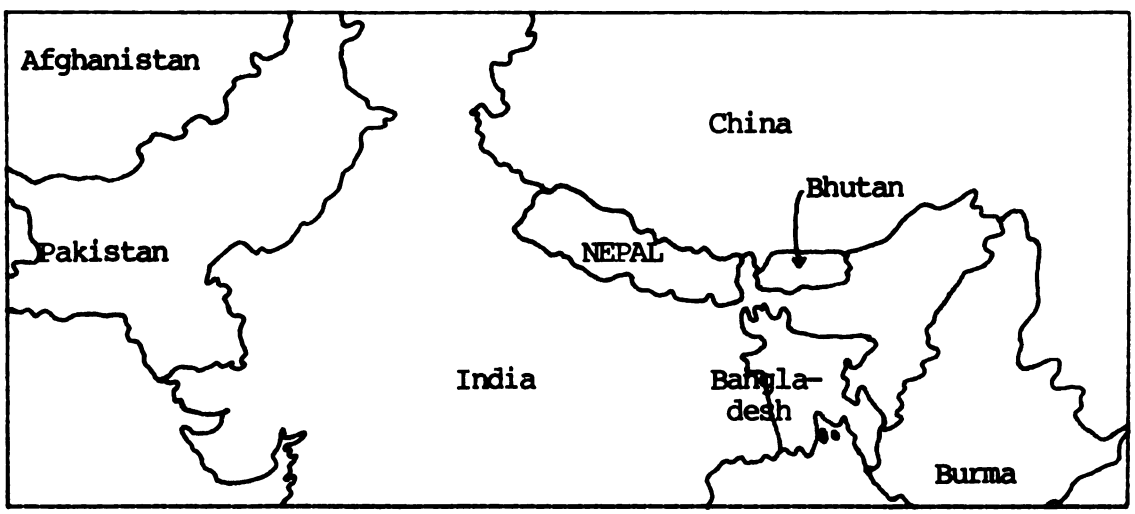


Figure 1. Nepal and Her Neighbors
(Based on Bartholomew, John, 1981:102-103)

Origin of the Himalaya

The Himalaya is considered to be the world's youngest mountain range with its own individual history of origin based on the

Continental Drift Theory as proposed by Wegner. Hagen(1961:50-53 and 1963:1-96) explained that it had emerged from the Tethys Sea in four main phases between the Mesozoic era (70 million years ago) and the late Pleistocene era (200,000 years ago). The drifting plate of the Indian sub-continent pushed the Chinese plate, which resulted the squeezing of the Tethys Sea and the rising of the Himalaya, the Mahabharat and the other physical structures. Similar view is held by Karan and Jenkins (1960:15), Fuch and Frank (1970:98-100), Shrestha, C.L. (1973), Sharma, C.K. (1977:10-16), Zollinger (1979), and Jhingran (1981:77-98). Based on the frequent earthquakes and the raised river terraces etc., the geologists feel that the Himalaya is still rising.

Physiography

There are several approaches to physiographically divide the environment of Nepal. Gurung (1971: 1-10, 1973: 25-33, 1977: 2) catagorized three main east-west ranges and the four characteristics lowlands in between (Table 2).

Table 2. Physiographical Division of Nepal

Ranges	Lowlands	Altitude (meter)	Average Width (km)
	Bhot	1500-4500	10 to 20
Himal		above 4500	15 to 25
	Pahar	600-2000	60 to 100
Mahabharat		1500-2700	15 to 20
	Dun	600-900	10 to 20
Chure		600-1500	10 to 15
	Terai	below 300	up to 45

(Sources: Gurung, 1971, 1973, 1977; and Karan et al, 1983)

Similar divisions were also proposed by Hagen (1961:36-40), Baidya (1970:5), and Dobremez (1976:26). The physiographical division of Nepal was viewed in similar but broader ways by Karan and Jenkins

(1960:15-16), Thapa and Thapa (1969:4-14), Fleming(Jr.) (1971:28), and Sharma, R.P. (1974:3-11) (Table 3).

Table 3. Four Classifications of Nepal's Physiographical Divisions

Karan & Jenkins	Thapa & Thapa	Fleming(Jr.)	Sharma, R.P.
Tibetan Zone	Inner Himalaya		
Himalaya	Himalaya Pass	Highland	Himalaya
Middle Range	Mountain Valleys	Midland	Mountain
Churea	Dun(Inner Terai)	Lowland	Inner Terai
Terai	Terai		Terai

Both Tables 2 and 3 are equally useful to study the Nepalese environment. The cross section through north-south gives a conception (Figure 2).

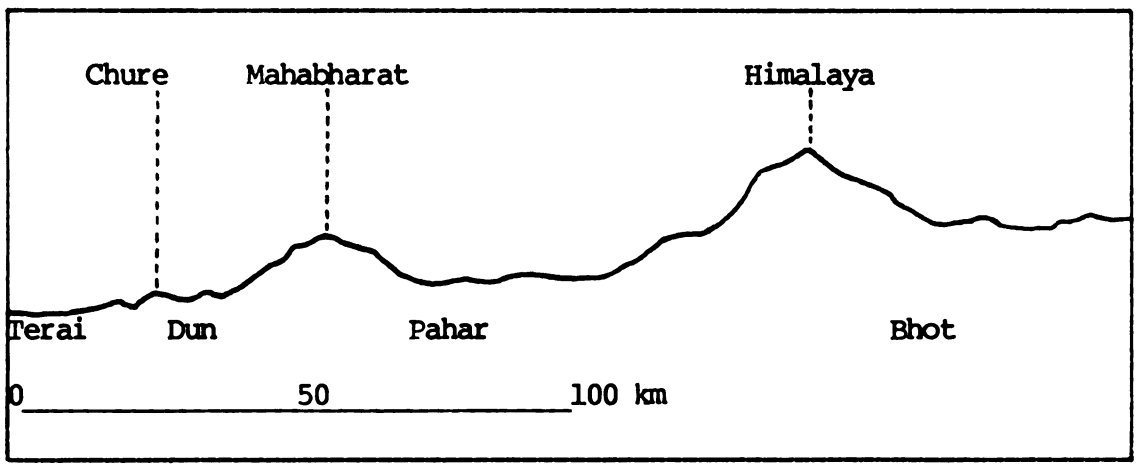


Figure 2. Cross-section Along Annapurna Meridian (Based on Dobremez, 1976:26)

Nepal can also be divided into three major watersheds of the rivers viz. the Koshi, the Gandaki and the Karnali, and their respective tributaries (Hagen, 1961; Thapa and Thapa, 1969:15; Gurung, 1973:25-33; Sharma, R.P., 1974; Bhatta, 1977:40; and Sharma, C.K., 1977:16-43) (Figure 3).

The physiography of Nepal is shown in Figure 3.

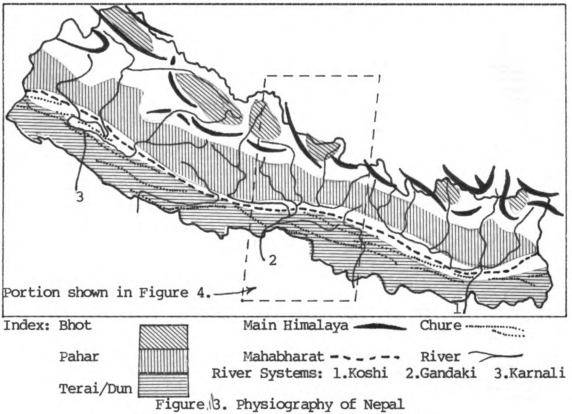
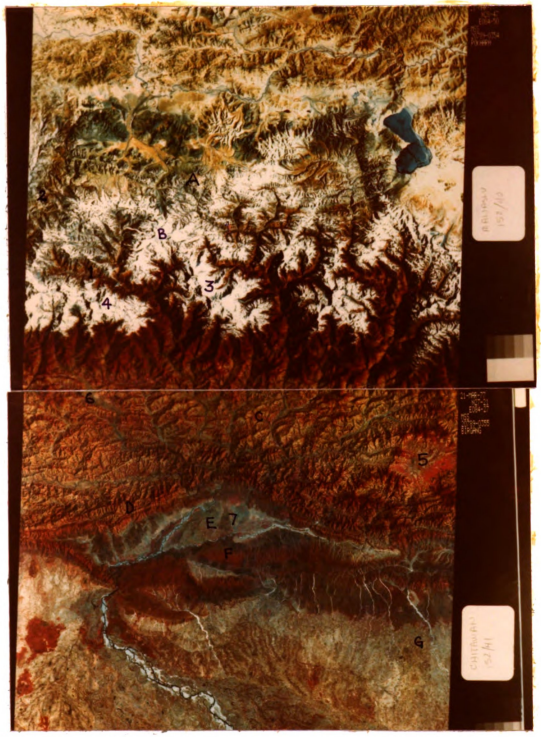


Figure 3. Physiography of Nepal
(Sources: Dobremez, 1976; Hagen 1961)

A satellite imagery gives an overall concept of the physiography of Nepal. For reference a portion of Nepal is shown in Figure 4 which can be considered as the reliable physical map of central Nepal (rather called a picture). The imagery was taken by the Landsat on March 21, 1977 at about 9 o'clock in the morning.

Climate

Two elements of climate, precipitation and temperature, are mainly affected by two topographical factors: altitude and aspect. Based on Thornthwaite's model, Naya Va (1975:14-20) classified Nepal's climate by taking an account of thermal coefficiency and altitide. Such correlation between climate and altitude was prescribed by Kawakita (1956:57), Hagen (1961:48), Stainton (1972:16-52), Dobremez (1976:131-257) and Gurung (1977:2-3). Table 4 gives a general concept



Index: A. Bhot- 1.Manang, 2.Mustang; B. The Himalaya- 3.The Manaslu, 4.The Annapurna; C. Pahar- 5.Kathmandu valley, 6.Pokhara valley; D.The Mahabharat; E. Dun- 7.Chitwan (Rapti dun); F. Chure; and G. Terai.

Figure 4. Satellite Imagery of Central Nepal
(Source: Roller, N., Environmental Research Institute of Michigan)

held by four authors having different field of expertise.

Table 4. Climate of Nepal based on Altitude

Altitude m	Naya Va Climato-logist	Gurung Geographer	Dobremez Ecologist	Kawakita Botanist
			Subnival	
5000	Tundra		Upper Alpine	Nival
		Tundra	Lower Alpine	Alpine
4000	Taiga		Upper Subalpine	Subalpine
	Micro-	Temperate	Lower Subalpine	Cold
3000	thermal		Mountain	temperate
	Meso-		Hill	Temperate
2000	thermal	Moist sub-tropical	Upper Subtropical Lower subtropical	Warm temperate
1000		Humid sub-tropical	Upper Tropical	Subtropical
500	Tropical		Lower Tropical	Tropical

Due to extreme topography, the microclimate is very sharp in Nepal. Hagen (1961:12) described the Himalaya as the onesided meteorological unit; e.g. the rain-shadows are the characteristic of the lowland of Bhot as seen in Mustang and Manang. Dobremez (1976:42) presented the view that the isohyetal lines vary temporaly and spatially. Stainton's (1972:7-12) specific observations are closely related to the altitude and aspect. For example, rainfall is less intense but continuous at the higher altitudes while the south and east aspects are different from the north and west ones. Bhatta's (1977:11) observations are also similar e.g. southern Mahabharat slopes receive more rain than the Terai does, and western Nepal is drier than eastern Nepal. He also mentioned the microclimatic effect of the river gorges. Figure 5 shows Nepal's general bioclimatic zones.

A summary of climatic conditions as derived from the above mentioned sources is presented in Table 5.

Table 5. Summary of Climatic Conditions

Climate Type	Topography	Precipitation (Annual mm)	Temperature °C Summer	Winter
Cold Arid	Bhot			
Alpine	High Himalaya	snow	-5	
Temperate	Lower Himalaya	1000-3000	15-18	below 0
	Higher Mahabharat		(maximum)	(minimum)
Subtrop-	Pahar	250-6500	above 25	10
ical	Lower Mahabharat		(maximum)	(average)
Tropical	Dun, Chure	1000-250	above 30	18
	Terai, Bhabar		(maximum)	(average)

(Based on the foregoing discussion)

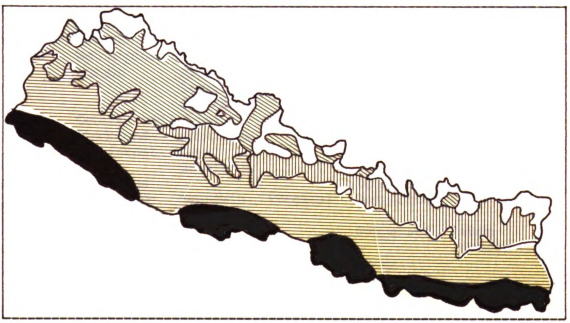


Figure 5. General Climatic Zones of Nepal.
(Based on Dobremez 1976:90)

Flora

Extreme variation between climatic and physiographical divisions has resulted in a wide variety of flora in Nepal. The standard way of dividing vegetational types of the country is basically the altitudinal difference. Various attempts to systematically present the

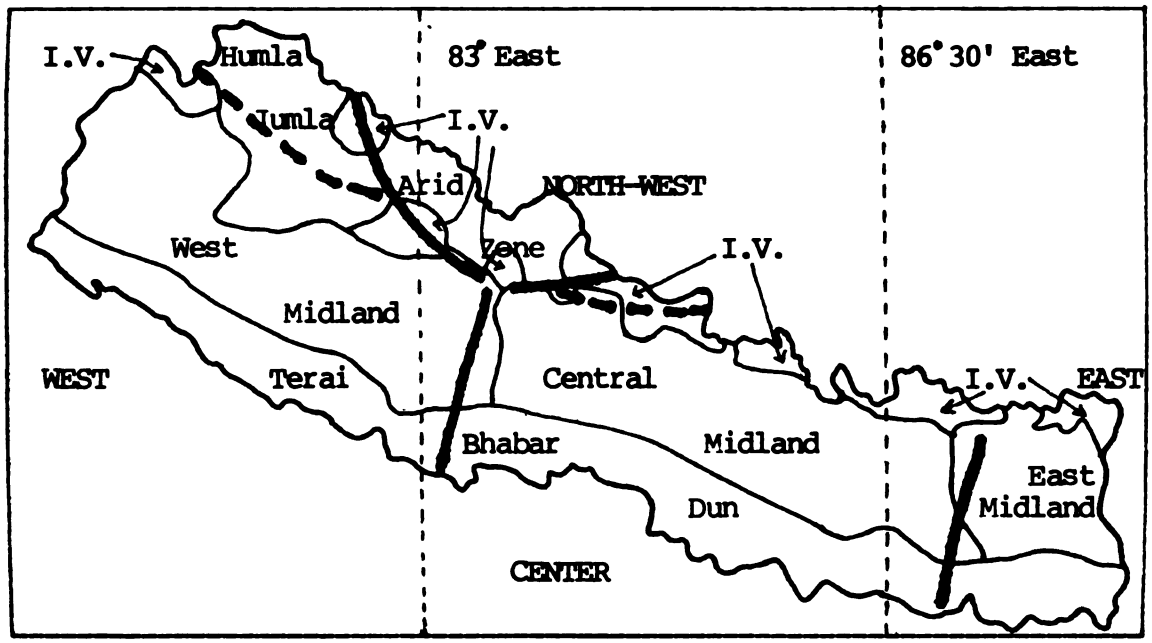
vegetation types were individually made by Kitamura (1955:73-77), Kawakita (1956:57), Hagen (1961:48), Stainton (1972:16-135), Dobremez (1976:131-257), and by Swan (Bhatta,1977:43). Five approaches in vegetational divisions based on the altitude which determines temperature, rainfall, and other microclimatic factors are presented in Table 6.

Table 6. Five Approaches in Vegetational Divisions

Altitude meter	Swan Ecologist	Dobremez Ecologist	Hagen Geologist	Stainton Forester	Kitamura Botanist
			Arctic		Permanent
	Dry Alpine forest	Subnival	Alpine		ice & snow
5000	Wet Alpine forest	Upper Alpine Lower Alpine	Subalpine		Arctic Zone
4000	Conifer and Rhododendron forest	Upper Subalpine Lower Subalpine	Temperate	Alpine Moist/Dry	Cold Temperate
	Deciduous			Upper	
3000	and Rhododendron forest	Mountain	Tropical	Temperate	
	Upper Monsoon forest	Hill		Temperate Lower	Warm Temperate
2000				Temperate	
	Middle Monsoon forest	Upper Subtropical Lower		Subtropical	
1000	Lower Monsoon forest	Subtropical Upper Tropical Lower Tropical		Tropical	Subtropical

Nepal's vegetation is not so simple to correlate with only the altitude. The other locality factors that affect vegetation are soil, temporall rainfall distribution, aspect, proximity to river, and moisture. Considerably detailed study in this field was independently done by Stainton (1972) and Dobremez (1976). The former specially discussed in terms of forests and tree species whereas the later

described phyto-geographically. Both of them overlap very closely, as shown in Figure 6. Nepal was considered as one phyto-geographical region by Hooker (Bhatt, 1977:58). Banerji (1978: 13) separated eastern and western Nepal along 83° East longitude (near Dhaulagiri). Hara and Williams (1979:8) used Stearn's three divisions seperated by 83° East and 86°30' East (near Okhaldhunga) longitudes (Figure 6). On the basis of the above and other available information Bhatta (1977: 58) arbitrarily divided Nepal along the Arun river and the Gandaki river. He mentioned horizontal and longitudinal transitions which were described by Stainton (1972) and Dobremez (1976).

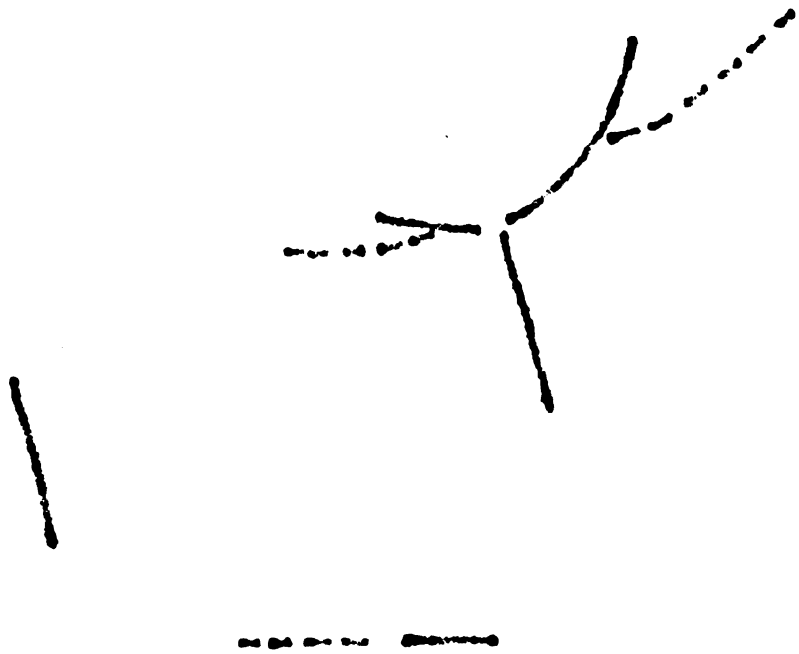


Index: Stainton's Division ——— (I.V. = Inner valleys)
Dobremez's Division - - - - - - -
(EAST, CENTER, WEST, and NORTH-WEST)

Figure 6. Vegetation of Nepal

Based on the above mentioned informations, flora/vegetation varies north to south and east to west. The main species occured in various floristic regions are presented in Table 7.

Nepal lies at the meeting ground of the Chinese, Indian,



Mediterranean, and the Siberian flora, and it has almost all climates from subtropical to alpine. Thus it is not a surprise that there are around 6000 species of plants (Gibbon and Ashford, 1983) and among them are 500 tree species (Dobremez, 1976:15).

Table 7. Flora in Various Regions

North	West			East
Subnival	High Altitude Species (Herbs)			
5000 m			lawns	
Alpine	Juniperus squamata	(barren)	lawns	Rhododendron species
4000 m	Juniperus indica	Quercus species	Betula	utilis
Subalpine	Caragana species	Abies pindrow	Larix potanini	Rhododendron species
			Abies spectabilis	Larix griffithii
3000 m	Cupressus torulosa	Cedrus deodara	Quercus incana	Quercus species
Hill	(NORTH-WEST)		Abies pindrow	Alnus nepalensis
Mountain				
2000 m	(WEST)		(CENTER)	(EAST)
	Oleo cuspidata		Pinus roxburghii	Schima wallichii
Subtropical	Pinus roxburghii		Schima wallichii	Castanopsis indica
1000 m				
Tropical	Grassland	Shorea robusta Anogeissus species Dillenia pentagina	Shorea robusta, Terminalia species, Dillenia indica, Cycus pectinata, Acacia catechu, Dalbergia sissoo	
South	Dry			Moist

(Based on Dobremez, 1976:244)

Fauna

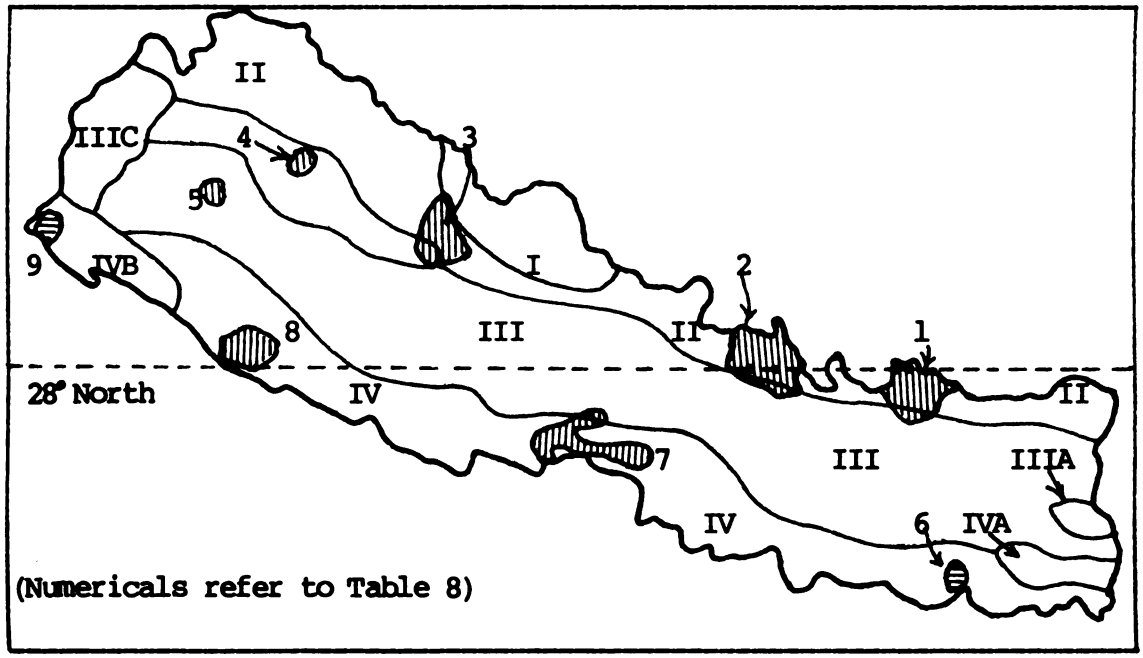
The palearctic and the oriental fauna meet in Nepal. Moreover, the varied topography, climate and the vegetation proved to be ideal for faunal variation and distribution. Bhatta (1977:70-72) referred to Prater (1928), Swan and Leviton (1962) and Caughley (1969) in order to divide Nepal into zoo-geographical regions. Fleming, Jr. (1971:28) divided Nepal into following three regions:

i) Palearctic in the northern highland

ii) Indo-Chinese Oriental in the midland,and

iii) Indian Oriental in the southern lowland

The above divisions are conspicuous when one studies the descriptions of national parks and wildlife reserves (Upreti, 1982:3-8; and Bhatta, 1977: 79-108). Prater (1965:17) found 28° North parallel as the distinct line dividing palearctic to the north and oriental to the south. However, the oriental fauna of the Bardia national park and the Suklaphanta reserve lies above the said parallel and the palearctic animals of the Sagarmatha national park lies below that (Figure 7).



Index:		I	Trans-Himalaya	II	Himalaya
National		III	Midland	IIIA	Mai Valley
Park		IIIB	Rara-Ringmo	IIIC	Baitadi-Darchula
Wildlife		IV	Lowland	IVA	Far Eastern
Reserve		IVB	Far Western		

Figure 7. National Parks, Reserves and Avian-zoogeography of Nepal (Sources: Fleming, Jr., 1971; and Upreti, 1979)

Some characteric birds and animals found in the parks and reserves are given in Table 8.

Table 8. Some Characteristic Birds and Animals of Nepal

#	National Park(NP) Wildlife Reserve(WR) Area sq.km.	Birds	Animals
1.	Sagarmatha NP 1243 sq.km.	Blood Pheasant, Damphe, Snow cock, Snow Patridge	Musk deer, Himalayan tahr, Serow, Snow leopard etc.
2.	Langtang NP 1710 sq.km.	Damphe, Monal, Blood pheasant	Bear, Leopard, Musk deer, snow leopard, etc.
3.	Shey Phoksundo NP 3000 sq.km.		Snow leopard, Blue sheep, Musk deer, Goral etc.
4.	Rara NP 106 sq.km.	Damphe, Kalij, Snow cock, Chokor, Chir pheasant etc.	Musk deer, Leopard, Serow, Goral, Bear etc.
5.	Khaptad NP —— sq.km.		Goral, Barking, Deer,Jackel, Wild Dog, Leopard etc.
6.	Koshi Tappu WR 65 sq.km.	Peafowl, Kalij, Fish eating birds	Tiger, Wild Buffalo, Nilgai, Chital, Dolphin etc.
7.	Royal Chitwan NP 932 sq.km.	Hornbill, Ducks, Aquatic birds, fowl	Tiger, Rhino, Gaur, Chital, Bear etc.
8.	Royal Bardia NP 368 sq.km.	" "	Samber, Chital, Swamp deer, Tiger, Elephant etc.
9.	Royal Suklaphanta WR 155 sq.km.	" "	Elepahant, Tiger, Swamp deer, Hog deer etc.

(Based on Upreti, 1979)

Bird-life is one of the striking features of Nepal. Fleming et al (1976) described more than 800 species of birds found in Nepal. Gibbons and Ashford (1983) noted that there were about the same number of bird species. Bhatta (1981:259) noted that there were about 850 species of birds that had been reported in Nepal. Fleming, Jr. (1971: 28) divided Nepal into four main avian-zoogeographical regions with specific important spots and subregions (Figure 7).

Man and Environment

People

Nepal is a country of diverse ethnic groups with their own culture, language and life-styles. The social scientists as well as the naturalists have tried to study these diversified ethnic patterns on the basis of the main natural factor, altitude. Iijima (1964: 93-94) observed that the ethnic identity of the villagers could be predicted to some extent by merely consulting an altimeter. Kawakita (1957: 99), Hagen (1961:64), and Karan and Jenkins (1963:142) divided Nepal into ethnic regions on the basis of altitude (Table 9). The highlanders are influenced by the Tibetan culture and the lowlanders by the Indian culture. The midlanders developed a typical Nepali culture which was influenced to some extent by the two distinct cultures.

Table 9. Some Ethnic Groups of Nepal

Altitude (meter)	Topography	Ethnic Groups
4000	Highland	Sherpa, Bhotea, Lama, Tamang, People of Olangchung, Topke, Mustang, Dolpo, and Rautye etc.
	Midland	Rai, Limbu, Thakali, Chepang, Newar,
2500		Magar, Brahmin, Chhetri, and Occupational castes etc.
	Lowland	Brahmin, Rajput, Tharu, Danuwar, Majhi, Satar, Dhimal, Darai, Rajbansi,
1000		Occupational castes etc.

(Sources: Kawakita, 1957:99; Hagen, 1961:64; and Karan and Jenkins, 1963:142)

Bista (1976:195) stated that the ethnic groups of Nepal were interlinked with each other on the basis of geographical and cultural factors. Only a few groups had lived in complete isolation. In his view, three altitudinal divisions are rather arbitrary. He did not

prepare an ethnographic map on the ground that the mobility of the people had increased. In the recent years, the people in the Terai, urban areas and along the roads are found to be a mixture of various ethnic groups.

The geography of a country can be safely correlated with the socio-cultural life of the people. Gurung (1973:25-33) and Shaha (1975:20-58) found such correspondence in Nepal. Malla and Rana (1973: 1-23) concluded that geography was the most visible form of the identity of being a Nepali. The emergence of a Nepali culture between the two great cultural and power entities of Asia, China and India, is possibly because of the geographical location of Nepal.

Livelihood

About 95% of the people in Nepal derive their livelihood from agriculture. The Nepalese agriculture is still mainly a traditional one. Most of the agriculture, especially the hill agriculture lacks modernization in terms of mechanization, applications of chemical fertilizers, and introduction of improved seeds. The basic factors that affect agriculture in Nepal are the natural elements such as climate (rainfall, cloud cover, temperature, and humidity) and topography (altitude, soil, water, aspect, and slopes). The social factors such as religion, attitudes, and ethics play a side role. For example, husbanding cattle, swine, and buffalo is influenced by religious factors. Kawakita (1956:87 and 1957:20), Karan and Jenkins (1963:142) and Bhatta (1977:131) independently observed the altitudinal limitations of various crops and livestocks (Table 10).

Based on the government agricultural statistics, Bhatta (1977:128-129) divided Nepal into six major agricultural zones, i.e.

eastern and western Terai, Inner Terai, Kathmandu valley, and eastern and western hills. Hill agriculture is also divided by Ong (1981:3) into three regions based on altitude i.e. low, mid, and high hills. A comprehensive agricultural zonation for the administrative and research purposes was suggested by Amatya (1973-74:15) (Figure 8).

Table 10. Altitudinal Limitations of Crops and Livestocks

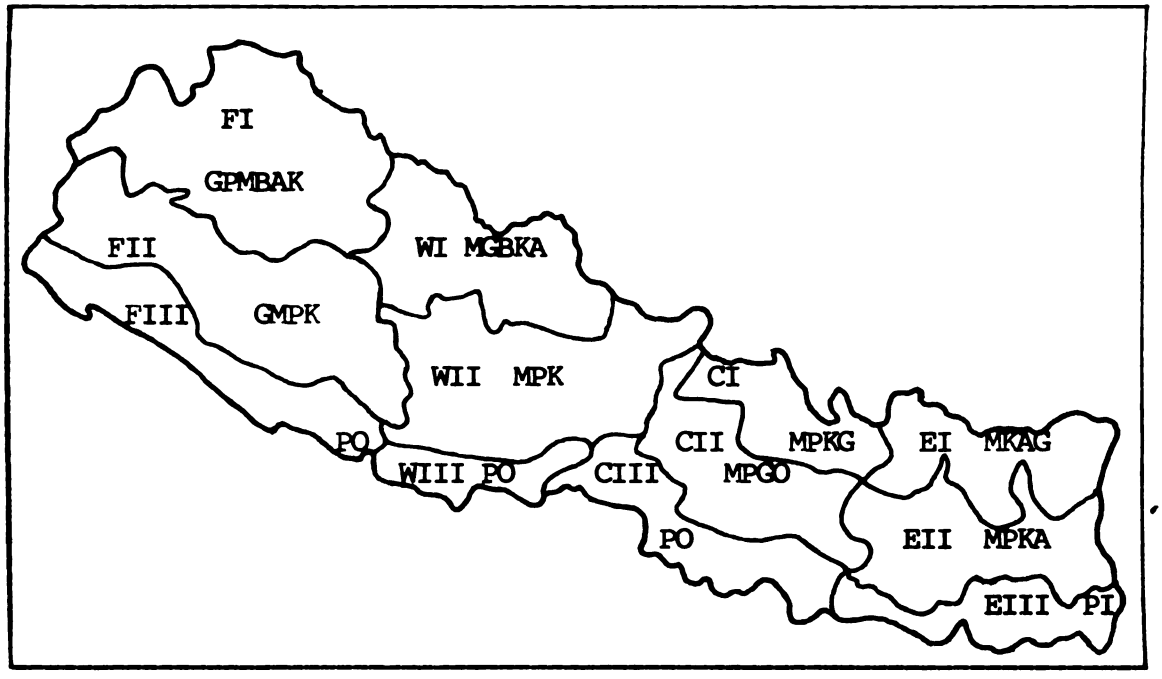
Altitude meter	Climate	Crop	Livestock
	Alpine		
4000		Potato, Buckwheat, Oat	Yak, Sheep,
Highland	Subalpine	Barley	Goat, Sheep, Yak
3000	Hill	Maize, Wheat	Yak
Midland	Mountain	Rice, Temperate Fruits Buchwheat	Cattle, Donkey, Goat
2000	Sub-tropical	Rice, Millet Oilseed	Buffalo, Cattle, Swine
1000		Rice, Tropical Fruits	Buffalo,
Lowland	Tropical	Oilseed, Jute	Cattle

(Sources: Kawakita 1956:87 and 1957:20; Karan and Jenkins, 1963:142; and Bhatt, 1977:131)

Apart from agriculture, cottage industry also prevails among the Nepalese. Acharya (1976:74-83) discussed 15 major cottage industries of Nepal: weaving (cotton and wool), leather & shoe, blacksmithing & metal crafts, pottery, wood turning & carpentry, rope making & bamboo products, slate mining & quarrying, Nepali paper, water-mill, and handicrafts. These industries are affected by natural resources in one way or another. Because most of them derive their raw materials from the natural resources.

Porterage and trade are also common occupation among the Nepalese. Furer-Haimendorf (1975) described the highlanders as the Himalayan traders. Tourism has resulted in new occupations which changed the life-styles of the Sherpas and other ethnic groups of

Nepal. The expanding network of industry, communication and services has also absorbed the Nepali man-power. The military services within and outside the country is yet another occupation for the rural youths.



Index:

Zones		Crops	
E = East	I = Himal	P = Paddy	M = Maize
C = Central	II = Pahar	G = Wheat	B = Barley
W = West	III = Terai-Dun	K = Millet	A = Potato
F = Far-West		O = Oilseed	J = Jute

Figure 8. Agricultural Zones and Major Crops of Nepal
(Source: Amatya, S.L., 1973-74:15)

Basic Needs

A seminar on basic needs for Nepal focused on six aspects - food, shelter, clothing, drinking water, basic education, and basic health services (Ligal, 1980:21-25). The third objective of the Sixth Plan (1980-85) of Nepal was to meet the minimum needs of the people, such as foodgrains, firewood, drinking water, basic health services, and basic transports (NPC, 1979:18).

The basic needs are in one way or another linked with the natural environment. Food is a product of agriculture which is closely related

with the natural environment, as described previously. The types of shelter differ from highland to midland and to lowland (Karan and Jenkins, 1963:59). Moreover, the materials e.g. stone, wood, mud, slate, thatch, brick etc. are but the products of the natural system. Sharma, C.K. (1979) explained that the Nepali life is affected by the environment, especially on dress, house, and food. The basic materials like cotton, wool, and leather for making environmentally suitable attire come from nature through agriculture, livestock and other livelihoods. Energy of Nepal at present is mostly supplied from the forests in terms of firewood. About 95% of the energy requirements are met with firewood. Sources of potable water both for the human and livestock consumption and also for the agriculture depend upon the environmental factors such as climate, geology, and vegetation.

Human health cannot be completely separated from the local environment. Francois (1962:274-280) explained the beneficial influences of forests on health. WHO (1974) listed 18 common health problems in Nepal such as diarrhoea, malaria, goiter, inadequate clean water, poor sewerage system, etc. and these are intertwined with the diverse environmental factors (Thapa,Y.S., 1980:150-152).

Basic transportation in Nepal means trails and suspension bridges. These structures are essentials because of the rugged terrain, turbulent rivers and other environmental factors of the country.

Being a farmer by profession and rural by location, the majority of the Nepalese spend their time in farming, husbanding animals, fetching water, collecting firewood and fodder, and other domestic works. Sharma, S.R. (1980:142-144) noted that the value of education

had not yet been appreciated. It is obvious that such appreciation would come only when the people find education as a tool to improve their life and not as a 'labor-hijacker'. Naturally, the basic education of Nepal should be linked with the natural environment and the daily life of the people.

Ecosystem

The Himalaya is not a mere set of flora, fauna and the people arranged vertically or horizontally, but is a system of the natural elements and the human beings. Based on such complexity, Rieger (1981:371) sugggested to consolidate the efforts on the study of the Himalayas, so that the present trend of devastation can be stopped. Such complex ecosystem has been studied by Swan (1968:68-78), Banskota (1980:21), Hoffpauir (as cited by Poffenburger, 1980:47), and Axin and Axin (1981:16). Focusing on the livelihood and the basic needs, Figure 9 gives a graphical presentation of the ecosystem.

The basic factors of the natural conditions are climate and topography which play a major role in the natural system and the people's community. The basic natural resources are soil, water, forests, animals (including insects and birds etc.) and energy (solar, wind, hydro-electricity and hydro-mechanics etc.). These are the products of a natural system which consists of various cycles of water, nutrients, energy and life; the processes like soil building and soil erosion; and the relationship between soil, plant and water.

People's community, influenced by natural conditions, produces human resources e.g. knowledge, technology, motivation, labor and population. People's livelihood such as agricultre, pasture, cottage industry, and miscellaneous occupations (tourism, porterage,

trade etc.) and conservation depend on the human resources and the natural resources. Thus the livelihood of the people depends upon the natural resources combined with their availability and utilization for such basic human needs as food, cloth, potable water, firewood, fodder, shelter and health as well.

Finally the community and human resources are fedback by the basic human needs as shown in Figure 9.

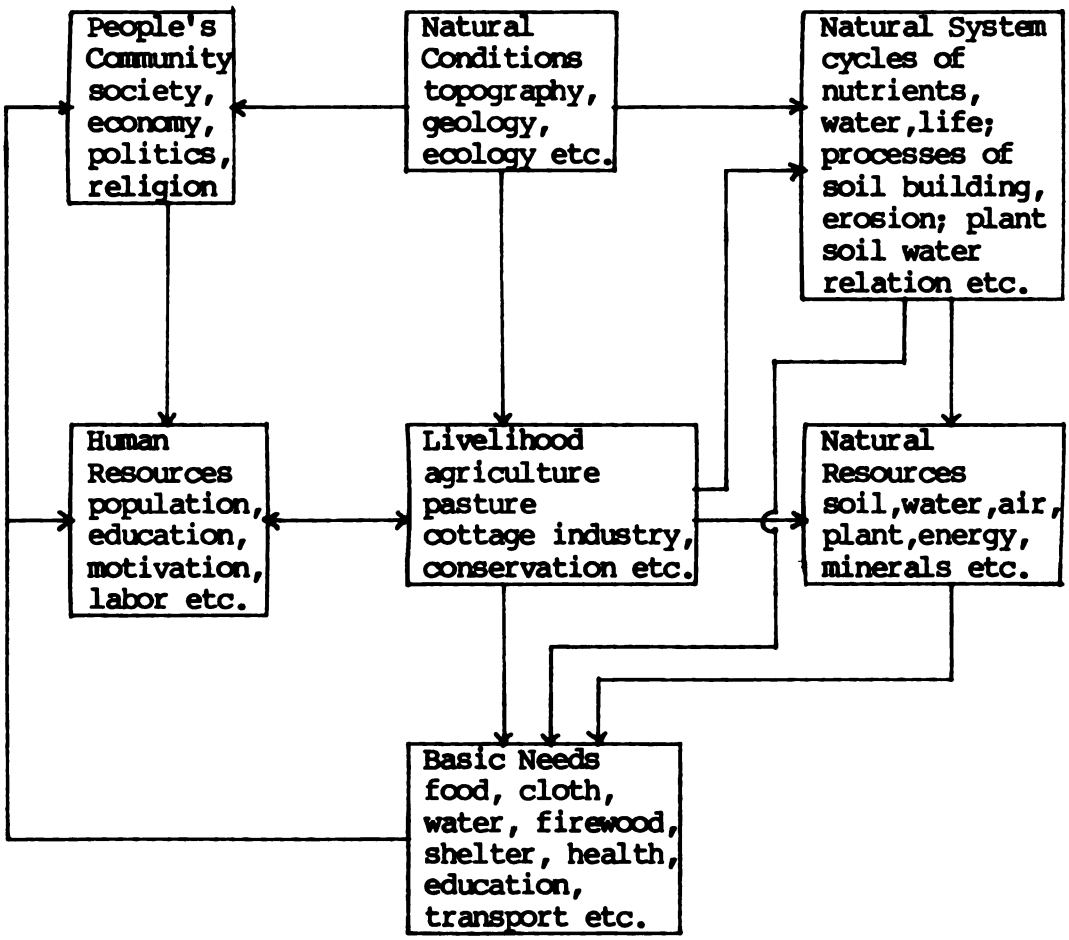


Figure 9. Man - Nature Relationship
(Based on the foregoing discussions)

Conservation for Development

The Vicious Circle

Ecologically man is but a part of the natural environment. In a keynote address to the IUCN meeting, Adu (1964:9-18) proclaimed that man was a natural resource. Slatyer (1972:17-26) described man as an animal but different from other living beings. In the context of Nepal, Swan (1968:68-78) described a Tibetan man as a part of the high Himalayan ecology. These views combined together with the ideas presented before emphasize the close relationship between man and the environment in Nepal. However, this relationship has lost its harmony and balance, and turned into a vicious downward spiral.

Eckholm (1976:76-82) discussed a vicious circle of fodder - manure - firewood - dungcake - low production - deforestation. Banskota (1980:21) presented a similar circle with more components i.e. soil erosion, food grains, and meat/milk etc. Blaikie et al (1980:214-215) also described a circle which was very similar to Eckholm's. Hoffpauir (1974), Gaige (1975:64), Rana, R. (1976:116), Poffenburger (1980:18-19), and Rieger (1981:362-364) viewed the affair through socio-econo-cultural and environmental approach. Axin and Axin (1981:16) expressed similar ideas through the small subsistence farm family ecosystem. A report on Nepal and ICIMOD (1983) vividly analyzed the vicious circle and the downward spiral of the environment of Nepal. (IDS,1983). These ideas were also reflected in the films viz. The Himalayan Farmer (1975), Deshko Mato (The Land of Nation) (1978), and the Fragile Mountain (1982).

Figures 10, 11 and 12 give a glimpse of how a farmer in Nepal is caught in the vicious circles of firewood, fodder, potable water and

deforestation respectively.

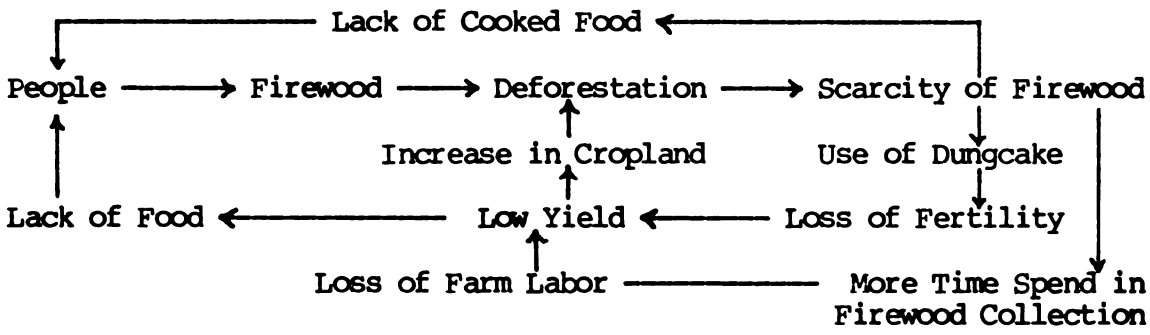


Figure 10. Vicious Circle of Firewood in Nepal

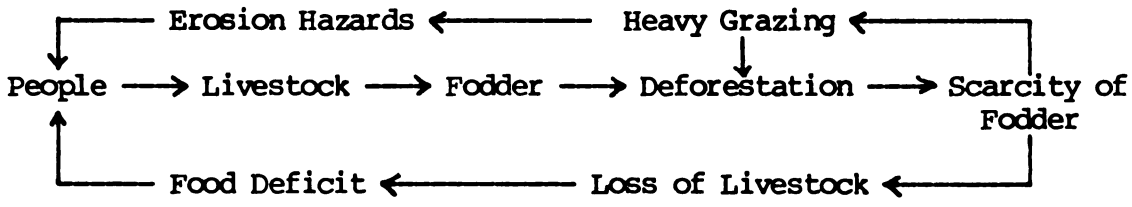


Figure 11. Vicious Circle of Fodder in Nepal

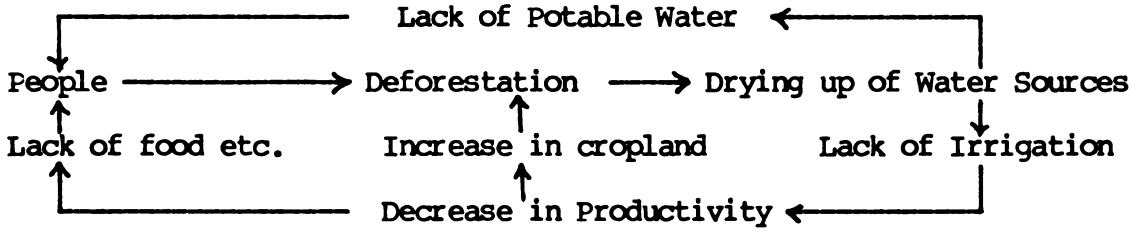


Figure 12. Vicious Circle of Potable Water in Nepal

(Based on the foregoing discussion)

In all three Figures 10, 11, and 12 deforestation is the focal point of the other problems. The problem of deforestation prevailed in the country as early as the 1950s (Robbe, 1954:21-25). Soil erosion was also common then, due to fire, grazing, lopping, deforestation and shifting cultivation. The UNECAFE (1961:67-76) report also mentioned

such environmental degradation in Nepal.

Similarly, the World Bank report also summarized that serious ecological problems were the constraints of development in Nepal, and that the country was caught in the vicious circle of poverty (Huang et al, 1979:i).

Development in Nepal

Nepal started her systematic development activities with the First Five Year Plan (1956-1961). By the year 1978, there were some visible results of development efforts (Table 11).

Table 11. Development Results in Nepal (1951-1978)

Items	Unit	1951	1961	1970	1978
School(all levels)	No.	334	6150	8370	12636
Hospital Bed	No.	..	797	..	2495
Road(all kinds)	km	376	912	2504	4595
Irrigation	ha	..	2000	..	31554
Tourist	No	..	5954	45970	156,123

(Source: Plan Documents, and CBS, 1982)

The statistics cannot be regarded as the basis for the progress done by the people. There were remarkable changes in the definition of development. Stiller and Yadav (1979:50-53) described the five stages of realization in development approach. Each approach defined development in its own way and a subsequent stage was modified in order to make it more effective (Figure 13).

The modification of development approach can be related to the growing problems of the country, irrespective of the development achievements. Lohani (1976) mentioned that even the then prime minister openly realized that few infrastructures and few factories were not the sign of development. Improvement of people's cognitive and economic standard should be regarded as the development measures.

This idea is reflected in the works of various authors viz. Gaige (1975), Calkins (1979), Rose and Sholz (1980), Blaikie et al (1980) and Poudyal (1983).

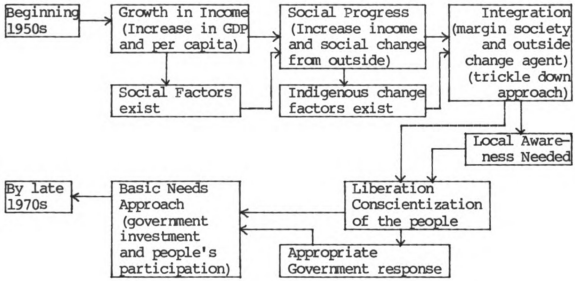


Figure 13. Modification of Development Approach

(Based on Lohani, 1976; Stiller and Yadav, 1979:5053; NPC, documents on various plans)

Consequences of Development

Based on the previous discussions on ecosystem, the vicious circle and development in Nepal, several problems stagnating Nepal's development can be visualized. The UN General Assembly catagorized Nepal as one of the 25 "hard-core" least developed countries (Ceres, 1972:13). In 1979 Nepal was placed in the rank of the six poorest countries of the world viz. Kampuchea, Laos, Bhutan, Bangladesh, and Chad (KC, 1982:101). Harris et al (1964 and 1973), Chand (1976), Calkins (1979), Pant and Jain (1980), Poffenberger (1980:10), Blaikie et al (1980:17) discussed these problems on socio-economic and environmental grounds. The problems are in one way another related to the basic needs e.g. scarcity of firewood, fodder, and potable water,

health hazards, erosion, food deficit, population explosion, unemployment, illiteracy, poverty, inadequate social services, and low level of infrastructure etc. Thus it is observed that the development activities in Nepal did not help promote the overall upliftment of the people's living standard as expected.

Moddie (1981:341-348) found that man was the maker of deserts in the past, even with his bare hands, and often in the name of progress. He also indicated that such man-made deserts had been spreading from Afghanistan to Bhutan. Furer-Haimendorf (1975:11-12,97) found heavy deforestation due to the halting of the Sherpa community's forest management practices of selecting a Shingo naua (a forest guard). Such drastic change occurred following the government's step to enforce the 1957 Private Forest Nationalization Act. Such adverse impact of the Act was also seen in the midland and other areas of the country where otherwise the local people used to conserve, protect and harvest the local forests.

Political changes also have adverse effect on the natural environment of Nepal. For example, in-migration because of changes in Tibet in the 1950s increased human as well as livestock population in the high Himalayas (IDS, 1983:30). Nepalization of the Terai caused a loss of natural forests in the region (Gaige, 1975:82). Similarly, in-migration of the Indian origins and of the Nepalese from various countries with political changes had similar impacts.

Schild (1976:8-9) mentioned that several development activities in the mountains caused deforestation, e.g. Langtang Cheese plant and Solu Carpet Industry caused deforestation in the localities. Sharma, C.K. (1979) observed that Nepal was loosing her peace, value, and

gravity in the name of development. The observations by Shrestha and Sharma (1980:32-33) was that development invited the new problem of erosion.

To be very specific, there are some examples that revealed that development brought environment problems in Nepal. The problems are not like "smog" or "acid rain" as experienced in the developed countries but like deforestation, soil erosion and so on. One of the visible development works in the country is road building. Shrestha, R.L.(1980) found that the Tribhuvan Rajpath (Kathmandu - Raxaul Highway) had positive impacts on the national economy. Schroeder and Sisler (1970) also hypothesized that the Sidhartha Rajmarga (Pokhara-Sunauli Highway) would have a significant impact on the cropping pattern and distribution of incomes in the Pokhara valley. To the contrary Blaikie et al (1979) found that towns grew along the road; imported goods discouraged indigenous crafts and goods; the dealers and the merchants were benefitted more; and trade increased but not the local production. Stiller and Yadav (1979:170) found that deforestation (and erosion) took place not only during the construction period but even more after the completion. They explained that the illegal truck loads of timber and firewood used roads to Kathmandu. Devkota (1980:54) analyzed that because the roads remained under-utilized, the investment was almost a waste.

Chapagain (1976) noted that during 1961-1974 there had been an increase in agricultural inputs e.g. land, labor, animal power, fertilizer, improved seeds, machinery, and chemicals. The HMG statistics also indicated a rise in agricultural inputs for the period 1965-1977 (CBS, 1982:55). But agricultural productivity was declining

in the 1960s (Rana and Mohsin, 1967). The HMG figures showed that food production declined during 1975-80 by 1.1 %. And the food deficit districts increased from 26 in 1975 to 46 in 1980 (KC, 1982:111). Joshi (1978:6) also explained that agricultral yield increase was due to increase in land under cultivation, which means reciprocal decline in forest areas (Table 12). The anomaly of increase in agricultural inputs and decrease in food production was also analyzed by Poudyal (1983), and Pant and Jain (1980) that the needy small farmers could not get benefits from the government services.

Table 12. Land-Use Change in Nepal 1954-1980

Land-Use	1954 (a) %	1959 (b) %	1975 (c) %	1980 (d) %
Forest	49.17	45.86	34.19	29.06
Cultivation	12.74	21.00	16.49	22.17
Snow Cover	16.72	11.83	14.97	14.97
Pasture	7.87	5.57	12.66	12.66
Water body, settlements	13.50	9.74	3.05	3.05
Others		6.00	18.64	18.09

(Source: a - Robbe,1954:2; b - Elliott,1959:61-62; c, d - KC,1982:10)

Table 12 provides an information of the land-use change in Nepal. The differences between the source and methodology of data collection are not considered.

Certain epidemic deseases e.g. malaria and smallpox were eradicated from Nepal. The result being possible because of destruction of the Terai forests which otherwise was "protected" with "malaria" infection. Population explosion and socio-economic factors led seasonal and permanent migrations. Moreover, the projects like Rapti Dun development also attracted the hill people to migrate into the Terai and Dun areas. IUCN (1971) reported that the decade 1950-61

was calamitous to the wildlife in Nepal due to deforestation. Gaige (1975), Dobremez (1976:112), Bhatta and Shrestha (1977), and Blaikie et al (1980:19) independently observed that the resettlements in the Terai led to deforestation, erosion, and floods.

Tourism is a prospective growth industry in Nepal. It has changed or improved to some extent the living standard of the local people in terms of income. A Sherpa earned 12 to 14 times more than the average Nepalese earnings through this industry (Hendel, 1983). However, Shrestha, (1976:88-91), Eckholm (1976:99), Moddie (1981:348-349), and Hendel (1983:1-17) found direct and indirect adverse impacts of "new nomadism". These impacts were deforestation (mainly for firewood), and pollution along the trails. The film "Tough Near the Top" pictured the pollution due to garbage in the high altitude region near the Sagarmatha, the highest peak on the earth.

UNECAFE (1961) mentioned the hydroelectrical potential as the greatest resource of Nepal. Acker (1981:92-94) suggested to develop hydro-electricity in order to save Nepal's dwindling forests. But a hydro-electric project cannot always be clean. Forests are destroyed for the creation of impoundment, high tension lines and for the construction materials. Though speculative, Hendel's (1983) view that electrical light would keep the people awake until late night which means more consumption of firewood to keep themselves warm, is not improbable, because electricity for heating and cooking would remain comparatively costlier than the freely available firewood.

This discussion leads to the conclusion that every development effort has its own kind of environmental dis-effects. It is not uncommon in Nepal that in the name of developing agriculture, natural

resources and other similar sectors, large complex of buldings have been created on the fertile soil.

Natural Environment and Development

From the preceding discussions it has been clear that the natural environment has a dual input to the development efforts. The natural resources e.g. soil, water, forests, and minerals are fundamentally needed for development. Basic needs are directly or indirectly supplied by nature. And, the "waste" of development works is recycled or absorbed by nature and again fed into the fundamental resources. However, there is a limit to this recycling by nature.

In an agricultral country like Nepal, the basic natural resources are soil, water, forests, minerals. The individual and combined role of these resources is of utmost importance. Even in a developed country, these rseources have more value than before.

Forestry became the focal point of community and rural development in China (FAO, 1978, 1981, and 1982). Madan (1967:30-32) brought a concept of Gandhi in rural development, in which case a cottage would be built of materials obtainable within couple of hours' walk. The inherent idea was to integrate forestry in farming. Singh (1976:367-370) exprienced that forestry was an inseparable part of hill agriculture. Dobremez (1976:107) discussed the developing the medicinal plants in Nepal. The World Bank (1978) and FAO (1978) also emphasized the importance of forests in rural development. IDS (1983) reported that forestry can be a good opportunity for employment. Acharya (1976) also found a contributory relationship of forestry with the cottage industries.

Along with the fulfillment of the basic needs and contribution to

the rural development, the natural resources (especially the forests) have an equally important role in other developmental sectors. For example, river valley projects need forested watershed for their maximum utilization. The Trishuli hydro-electric plant and the Koshi barrage have suffered from heavy siltation (15 to 30 centimeters per year) because of deforestation in the upstream watersheds. For the development and the construction of roads (especially in the hills), the construction materials e.g. timber, soil, stone and sand are required and the forested hill sides protect the road. The industries need raw materials and fuel. A cigaret factory needs a single tree for drying of enough tobacco for making 300 cigarets. About 800 kg. of wood is used as fuel for making 200 sheets of Nepali paper (Acharya, 1976). Raw materials play a crucial role in the industries. Some forest based industries of Nepal produce matches, medicines, timber, katha, rosin and turpentine, bamboo goods (Joshi, 1978). Their survival depends on the sustained yield of forests. Daniel Wolfstone said, "Nepal is a Tourist Magnet" (HMG, 1970: 12). But tourism basically depends on clean environment (Dasmann et al, 1973).

Thus a rational use of natural resources is needed for development. Figure 14 clarified that a harmonious relationship of humans with nature promotes progress, whereas the human domination over nature spirals down to decline. Hence conservation practices are vital for the human progress. And conservation is not just for the sake of nature, but for the benefits of the entire biosphere. Similarly, conservation is neither a touchstone for success nor a panacea of all the human problems. But, just as it is obvious that development efforts which ignore socio-economy and technology are

likely to flounder, so is it obvious that development efforts that are not harmonious with nature are bound to suffer adverse consequences (Figure 14).

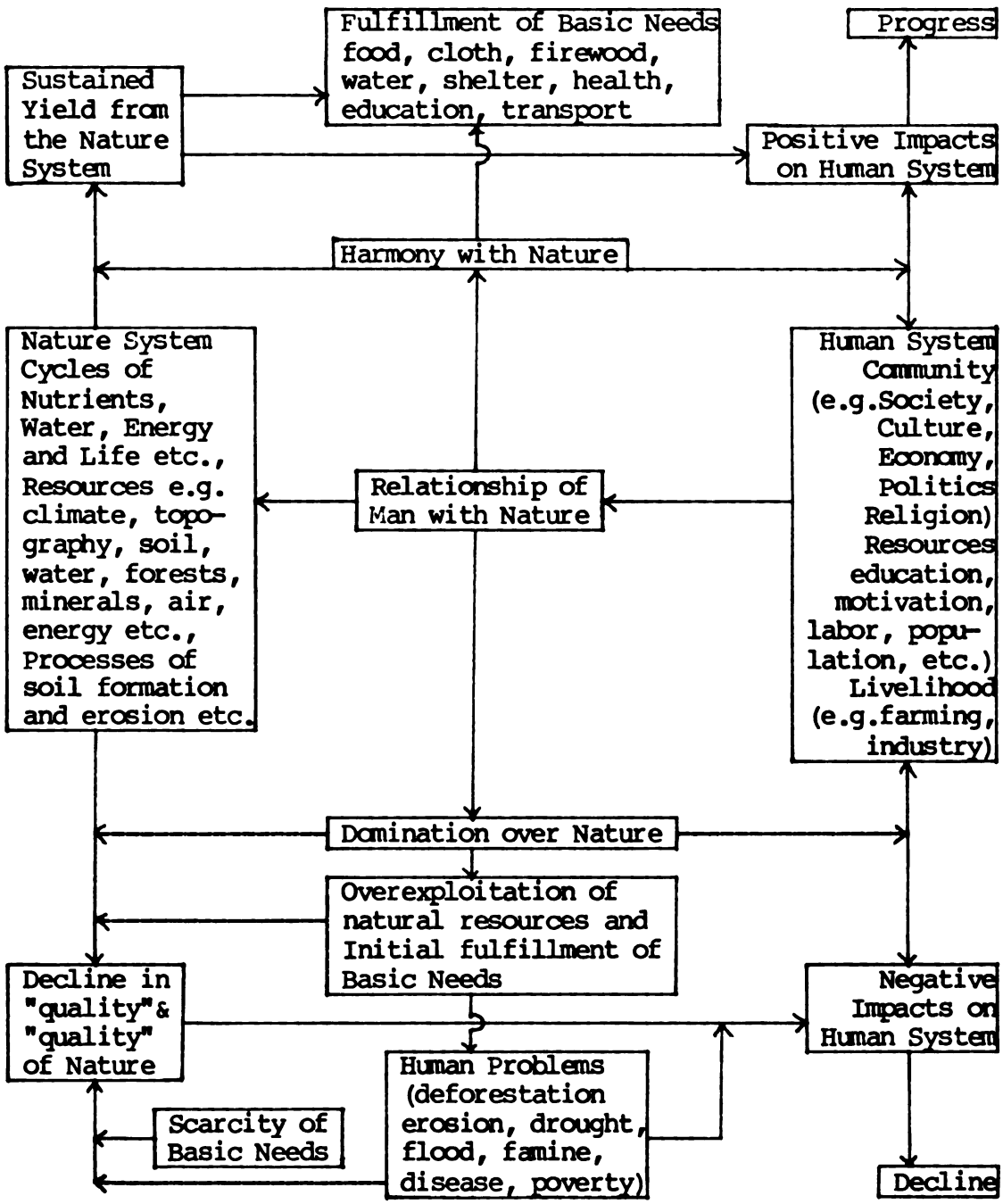


Figure 14. Human Relationship with Nature Towards Progress or Decline

(Based on the foregoing discussions)

Conservation Strategy

Global Efforts

The UN Conference on Human Environment, held in Stockholm in 1972, brought up an Action Plan later endorsed in UN General Assembly Resolution 2994 (XXVII) 1972 (Holdgate et al, 1982:8). The 280 recommendations of the plan have been grouped into three parts which relate to each other. Figure 15 gives a framework of the major elements and their links to conservation strategies.

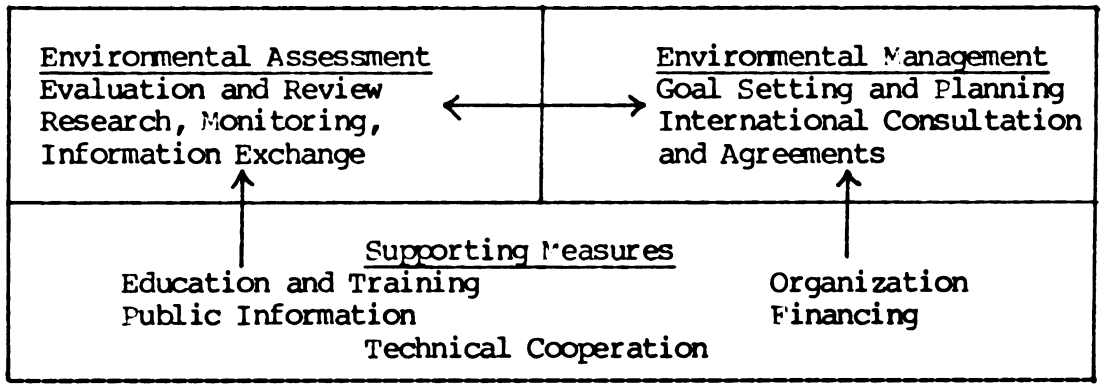


Figure 15. The Framework of the Stockholm Action Plan

Similarly the IUCN meetings discussed various topics on conservation strategies of global importance. Dasmann (1973:131-136 and 1975:263-269) proposed ecological principles for development with a view of "conservation as if people mattered and development as if nature mattered". Bannikov and Bogdanov (1973:121-130) put forward the essentials of conservation strategies e.g. legislation, implication of scientific knowledge, conservation measures, and education etc. The IUCN Secretariat (1975:228-229) emphasized the need of reassessment of renewability of natural resources. Ovington (1975:230-242) came out with the strategies dealing with the people's awareness and continuing education on environment. Neto (1975:258-262) found the strategy to be the utilization of nation's drives e.g. politics, economy, and public

opinion in conservation.

These views are also in harmony with those which appeared in the FAO documents. Wilm (1962:226-239) found the forest policy as a part of socio-economic policies and the strategies for forest development to be people's participation, technical and material assistance and incentives. Bresford-Peirse (1968:1-24) added aesthetic value on the wedding of forestry with rural development by considering the suitable strategies like commitment, priority, integration, and motivation (FAO, 1978:17, 1981:26-33). Worou (1982:8-10) and Chandrasekharam (1983:2-11) pointed out provisions for alternatives, demonstrations, and initiation of the local organizations. The recommendations by the World Bank (1978) also matched with those considered by the IUCN and the FAO. The communist view in the affair was explained by Robinson (1973) to be that the natural resources should be developed for the sake of all the people and not for the few profit oriented individuals or groups. In his conservation strategies, Riddell (1981:198) covered ideology, politics, socio-economy, and ecological principles. USDS (1981) report to the US President also described the environmental problems that were plaguing many countries around the world and emphasized on the formulation of conservation strategies.

The global future report to the US President presented similar view but with a remark that there had been positive changes in the government actions (Barney, 1980:3-5). But UNEP (1982) report mentioned that the overall state of the natural environment in the world had not improved during 1972-1982, indeed deterioration accelerated in various aspects. However, the report further said that notable advancement in conservation tools, e.g. remote sensing etc.,

had taken place so far. IUCN (1979) report noted that environmental laws were not sufficiently shaped and too little information, training and education on conservation still exist. Holdgate et al (1982:630) concluded their report with a remark that there was still less confidence in the managerial capacity of environmental agencies to apply known principles and techniques.

Along with the individual initiatives, there have been two remarkable efforts to formulate the conservation strategies through joint ventures. The IUCN and the Conservation Fund jointly sponsored the formulation of ecological principles for economic developments e.g. carrying capacity, limiting factors, ecological balance, natural functions (Dasmann et al, 1973:15-49). More enthusiastic efforts were initiated by the Environmental Conservation Group of the organizations like IUCN, UNEP, WWF, FAO and UNESCO while preparing the World Conservation Strategy (UNEP, January 1978 and October 1978). The strategy was presented in the three parts: Introduction, National Action , and International Action. The first part defined the key words like development and conservation, and discussed the vital importance of conservation for human survival. The second part laid a foundation for the development of national and subnational conservation strategies. The main elements prioritized were national framework, policy making and integrating conservation and development, environmental planning and rational use of allocation, legislation and organization, training and research, people's participation and education, and conservation based rural development. The third part prioritized international cooperation between nations in regional and global problems (IUCN, 1980) (Table 13).

Table 13. World Conservation Strategy

1. Introduction : living resource conservation for sustainable development
The objectives of conservation and requirements for their achievement
2. Maintenance of essential ecological processes and life-support system
3. Preservation genetic diversity
4. Sustainable utilization of species and ecosystems
5. Priority requirements: ecological processes and life-support system
6. Priority requirements: genetic diversity
7. Priority requirements: sustainable utilization
Priorities for national action
8. A framework for national and subnational conservation strategies
9. Policy making and the integration of conservation and development
10. Environmetal planning and rational use allocation
11. Improving the capacity to manage: legislation organization
12. Improving the capacity to manage: training and research
13. Building support for conservation: participation and education
14. Conservation-based rural development
Priorities for international action
15. International action: law and legislation
16. Tropical forests and drylands
17. A global program for the protection of genetic resource areas
18. The global commons
19. Regional strategies for international river basins and seas
20. Towards sustainable development

(Source: IUCN - UNEP - WWF, 1980)

National Efforts

Every nation in the world is unique in its natural environment, socio-economy, and political system. Yet the fundamental goal of conservation is basically the same everywhere, because the basic natural cycles, processes and the relationships are fundamentally the same everywhere. However, the strategy to achieve the said goal might vary from country to country or even within a country. For example, reforestation was the main drive of the war-striken countries like

China, India, North Korea, South Korea and Taiwan during the post World War II period. But the strategy of reforestation varied among these countries. For example, China and North Korea totally mobilized their respective people in plantation; South Korea and Taiwan used local organizations; and India mainly applied government efforts (Tables 14 & 15).

In China, the guidelines of the early 1950s were afforestation for erosion control, harvesting of natural resources, and planting of fast-growing trees (FAO, 1982). The four-sided forestry started in the late 1950s (FAO, 1983). Some of the Chinese accomplishments are : forest areas doubled since 1950 (FAO, 1983), the sorrowful river Huang He and others were tamed to become sources of prosperity (Cheng,1974), the shelterbelts were planted to establish the so-called "Green Wall of China" (Geping and Jinchan, 1981). The basic strategies behind their achievements are: sound forest policies for forest protection, large-scale afforestation, forest utilization, and forest based industries, forest education and research, and environmental aspects. Other inherent aspects are rural, urban, industrial and agricultural developments. The Chinese also adopted a nationwide plantation program in 1981, under which every able person has to plant 3 to 5 trees every year (FAO, 1982).

Conservation efforts in Taiwan are equally remarkable. The country experienced rapid land-use changes with deforestation in the late 1940s and in the early 1950s. However, afforestation was given a top priority in national development. The major accomplishments are afforestation, scientific management of forest, and application of science and technology in conservation. The strategies behind these

are: strong conservation policies, government commitment, initiation of the local farmers, international cooperation, and so on. For the purpose of soil conservation, forest exploitation was restricted and consequently national targets of timber production were not met during 1977-1980. Around 4,800 farmers associations have more than a million members out of total 18 million population. Thus the flexibility of the national plan for the sake of conservation and the initiation of the local organizations had a significant impact to restore the natural environment of the country (Hsia, 1958; Shen, 1966; Yuan, 1981; CAPD, 1982; and Yuan, 1983).

Both the North and South Koreans have their own story to tell about conservation efforts. South Korea started forestry programs in the early 1960s with emphasis on reforestation, erosion control, seedling production, and forest protection. The voluntary participation of the whole cross-section of the society made the "Unification Garden Movement" a success. The private sector was given a special attention in reforestation. The investment in forestry sector was in proportion of 5:4 as government is to private expenditures. For the mobilization of the private sector, the local associations were initiated and subsidies and loans were also envisaged. The longrange program included pollution control, research and development, and other recreational aspects of forests (Government of ROK, 1966 and 1971; Korea Development Institute, 1975 and 1978; and FAO, 1983). North Korea's notable conservation strategy included total mass mobilization in afforestation. Enterprises directly related to forestry have to form an afforestation team consisted of at least 5% of the total workers, whereas those indirectly related enterprises

have to form such team consisted of at least 3% of the total workers (FAO, 1983).

India has been a leading country in scientific forest management with her century old plantations. As in China, Taiwan, and Korea, afforestation was given a top priority in India's national development plans. However, the National Forest Policy of 1952 was not successful (Saxena et al, 1981: 196). Afforestation received about 60% of the forestry sector budget during 1969-1974. It is even more emphasized these days. The basic policy includes plantation for conservation, energy and industry, and with fast growing species. India's achievements in forestry are: scientific management plans for the two thirds of the state forests which comprise about 97% of the total forests in the country, and initiation in social forestry. However, the overall state of the forests and other natural resources remained unsatisfactory (Lanly/FAO, 1981; FAO, 1983; Saxena et al, 1981). The "Chipko" movement (hugging trees so that the contractors cannot fell them) spread over the Himalayan region in the 1970s. Such a movement indicated the vital concern of the local people for participation in forestry.

In plantation, Thailand comes in the middle rank of the tropical Asian contries (Lanly/FAO, 1981). About one-fifth of the forestry sector budget was spent in plantation and that was close to the forest-revenues indicating that there was a leakage in revenue (James, 1974). James' (1974) report indicated strategic needs of Thai forestry, such as national policy, research, survey, management, extension, education, demonstration, watershed management, forest based industries, massive tree plantation, and control of revenue

collection.

The CENTO (Central Treaty Organization) Seminar on Watershed Management held in Pakistan in September 1977 recommended several strategic guidelines for the respective countries like Pakistan, and Turkey, as follows: Integration of conservation in development, training/education in conservation, use of incentives, promotion of research (Kislali, 1977). Rao and Chandrasekharam (1983:11-21) gave their strategic views on the following aspects of the Asian and Pacific forests: protection of forest resources and environment, socio-economical and environmental impacts of fuelwood production, national plan and policy for production and trade, and research on agro-forestry.

Jacobs (1981) presented environmental strategy and action report for Canada. It was based on the World Conservation Strategy prepared by IUCN. According to Jackson (1976), the environmental issues received priority among many activities and the Canadian actions were as follows: research, organization, legislation, comprehensive planning, international activities, conference and others. Lundquist (1974) compared Canada, Sweden and the USA on the environmental policy matters. He found basic areas and the content of the three countries as follows: research and development, conservancy (park/reserve), pollution/erosion control, management of resource and waste.

In the US, the Environmental Education Act of 1970 (Public Law 92-516) came into effect by the early 1970s (Marcus, 1981:359-371). Rowe (1978) came with strategic suggestions that in the US, a single national policy was difficult and that there should be changes in "standard", the benefit-cost ratio of environmental management should

be positive, and more policies were required to control pollution. Greenland's (1983) guidelines for modern resource management placed emphasis on sound decision, best possible planning, efficient technical measures, ans so on. He also discussed legislation and concluded that the Acts were created in the US after the people learned from their mistakes.

Bannikov and Bogdanov (1973) reported to the IUCN meeting that environmental conservation was an inseparable part of social program. They mentioned the basic strategies as follows: legislation, scientific recommendations, quality control, conservation measures, and information & education. Pryde (1972) found similarities in the conservation policies of the USSR and the USA, such as high degree of federal encouragement in conservation activities, federally funded research organizations, high level academic interest, lesser but significant amounts of private conservation efforts, and large wasteland for conservation purposes. Pryde also mentioned that the Russians learned from their "Great Plan for the Transformation of Nature", and that the economists had begun to consider environmental conservation even though it lowers country's gross national product.

Table 14. Similar Conservation Efforts of China, India, North and South Korea, and Taiwan

1. Plantation
2. Watershed management
3. Conservation Policy
4. Research and Training
5. Extension and People's participation
6. Integration of Conservation with Development

(Based on the foregoing discussions)

Table 15. Unique National Efforts of China, India, North and South Korea, and Taiwan

Country	Unique Efforts
China	1. Total mass mobilization
	2. Individual plantation movement
	3. Four-sided forestry
	4. Grain production as the key link
	5. National movement to control soil erosion
India	1. Scientific forest management
	2. Recent social forestry
	3. "Chipko" movement
North Korea	1. Total mass mobilization
	2. Plantation team in every enterprise
South Korea	1. Scientific management of private forest
	2. Local forest associations
	3. "Unification Garden Movement"
	4. Subsidies and loan facilities
Taiwan	1. Local farmers' associations
	2. Flexibility of national policy for the sake of conservation
	3. Government commitment and subsidies
	4. International cooperation

(Based on the foregoing discussions)

Nepal's Efforts

Recently, ICIMOD was established to environmentally and economically develop the Hindukush-Himalaya mountain system. Its expectations are fairly enthusiastic, covering food, energy, cottage industry, and transport sector of development. The main activities are research, training, dissemination, documentation, and expertise. Its role has been emphasized to close the gaps in knowledge, technology, and institutions. The knowledge gap exists in ecology, conservation, natural resources, environmental problems, and demography. The technological gap exists in the areas of crop productivity, irrigation, livestock, fodder, compost, improved stove, afforestation, biogas, mini-hydro-electric works, cottage and other industry, and soil conservation. The institutional gap has been experienced in

community participation in conservation and management of natural resources, and national level research and development of forestry, agriculture, cottage industry, etc. (IDS, 1983).

FAO/UNEP (1981:331-341) found the situation of Nepal's forests as follows: inadequate information, unsatisfactory plantation, and unscientific utilization, along with deforestation. This indicated where conservation strategy should fit. Chakroff's (1979) report gave an impression that Nepal had a considerable amount of strategies to conserve the natural resources. The 1976 National Forestry Plan (DF, 1978) covered a wide range of forestry and related activities. It focused on five strategy-areas: environmental conservation, economic mobilization through forestry, scientific forest management, developing technology and knowledge, and public participation. For implementation it emphasized communication, organization, motivation, and evaluation. It also formulated forest policies for national development e.g. forestry for conservation, for fulfilling basic needs, promoting industries and so on. Moreover, it technically outlined twenty-two major forest management programs and procedures.

The Natural History Seminar held in Kathmandu in 1976 discussed and recommended that the study of natural science should be geared towards the national development. The suggestions brought up in the seminar were coordination and integration of government agencies on research and other common interest activities, and not to keep the university separate from such agencies (Bhatta; Malla; Rajbhandary; Sharma, C.K.; Shrestha, T.B.; and Pradhan, B.M.; 1976). The other seminars on basic needs (ILO-ARTEP, 1980) and on rural development (Banskota, 1980) identified the need of conservation as a strategy to

fulfill the basic needs and to develop rural areas respectively.

Calkins (1979) suggested five fundamental arsenals (as he called them) for conservation and development in Nepal: taxation on firewood, subsidies on kerosene, regulation of firewood, prohibition of cutting trees, and government assistance on reforestation and other public works. Hendel (1983) suggested conservation programs and tourism development in the Solukhumbu region of Nepal needed community action to conserve and reforest, and adequate alternate energy should be developed along with restriction in cutting trees, and regulation and education of trekkers. There were other sporadic efforts suggesting conservation activities in Nepal. Shrestha, K.K. (1976) emphasized conservation along with tourism development. Acharya (1976) suggested in a similar way for the cottage industry development. Shrestha, C.B. and Sharma, P.(1980) commented that there had not been any specific policy measure during the last four national development plans i.e. from 1956 to 1975. They found very general land-use policy in the Fifth Plan, and that the land-use policy for the hills was mainly concerned with conservation. They added that success of implementing land-use policy rested on coordination among the government agencies. Joshi, M.D. (1981) pointed out that prevention of environmental degradation was cheaper than reconstruction.

Some critical observations on conservation strategies were made by several researchers. Furer-Haimendorf (1964) found that following the nationalization of the forests, the selection of the community forest guards among the Sherpas (called Shingo naua) ceased to continue. One of the CEDA publications (1970) pointed out the following aspects of the forestry sector: it was not development

oriented, more attention towards Terai than towards the hills and the mountains, unjustifiable budget allocation for conservationist approach, forest land should be cleared for agriculture and other land-use, regeneration of forests takes a long time and hence economically suspect. The above comment reflected the attitudes of the development planners and the policy-makers of the government agencies. Sterling (1976) also mentioned in her article that the development planners actively favored, and indeed sponsored, the felling of trees, and they consistently focussed in other directions than conservation. She also noted that clearing Terai forests was the strategy of agriculture development. Gaige (1975:82) and Blaikie et al, (1980: 227,236) observed that the government policies sometimes appeared contradictory, such as Nepalization of the Terai and protection of forests. Such contradiction resulted in tensions and clashes between the armed forest guards and the landless people. One such events at Jhora (eastern Terai) left one person dead (according to the government source) and 75 (according to the press) (Gaige, 1975:82).

"Lack of consciousness" on the part of the villagers had been advanced as the reason for the shortfall in enthusiasm for voluntary participation in development works (Stiller and Yadav, 1979:136-137). Rana, P.S.J.B. (1971) and Lohani (1980) critically analyzed people's participation in development and independently came to the conclusion that the poor people were "forcefully" employed to "volunteer" in the programs which mainly benefitted the rich. Uphoff and Ilchman (1973) explained the level of people's participation i.e. decision-making, implementation, evaluation, and benefit-sharing. Manandhar et al (1982) discussed government efforts on forestry extension to promote

people's participation. On the part of the people, there had been consciousness about the environmental degradation. The people from Sindhupalchok district of Nepal responded that they were experiencing soil loss and they would plant trees if they could get benefits from those planted trees (SATA, 1976:159-161). D'Silva (1982) brought similar observation from Nuwakot district.

There had been efforts to formulate and analyze conservation strategies which, however, had yet to be clearly stated and envisaged in all development works. The informations in Table 16 give perceived problems and suggested solutions.

Table 16. Conservation Strategies Prescribed for Nepal

Formulator	Perceived Problems	Suggested Solutions
ICIMOD/IDS (1983)	Knowledge gap Technology gap Institutional gap	Research, Dissemination, Training, Expertise, and Documentation
National Forestry Plan (1976)	Deforestation, Environmental degradation, Ineffective organization, Unscientific management	Scientific management Developing technology Public participation Organizational reform, Communication, Motivation, Evaluation
Other Sources	Deforestation Contradictory policies, Mismanagement, Misutilization, Adverse impacts of development	Integrating forestry with other development People's participation Drastic change in organization, policy, and others

(Based on the foregoing discussions)

Conservation was also envisaged in the political and educational activities in Nepal. The "Go to Village" national campaign had its eighth task, to involve the local people in plantation (NCAER, 1970: 248). However, as commented by Rana,P.S.J.B. (1971) and Lohani (1980), the task could not benefit the lower strata of the society. The

National Development Service of TU, under which every masters level student had to serve ten months in a village, included conservation as one of the main activities (Razzaque, 1978). Both the Campaign and the Service, do not exist at present (i.e. 1984).

There had been a rising enthusiasm among the non-governmental organizations viz. Nepal Scouts, Nepal Redcross Society, and Youth Activities Coordination Committee etc. They included conservation as a part of their activities.

The strategic elements developed by the researcher for this study match with the World Conservation Strategy (Table 13), the national efforts (Tables 14 & 15), and with the strategies prescribed by various sources for Nepal (Table 16). All these four views are put together in Table 17 for the purpose of comparing the strategic elements of this study with the standard already published.

Table 17. Elements of Conservation Strategy Compared

This Study (Table 1)	World Conservation Strategy (Table13)	National Efforts (Table 14 & 15)	Prescribed for Nepal (Table 16)
Objective	Policy	Policy	Policy
Piority			
Budget		Budget/Subsidy/Loan	
Organization	Organization	Organization	Organization
Technical Areas	Utilization	Reforestation	Management
for Emphasis	Training	Erosion Control	Technological
(reforestation	Research	Management	development
forest management	Extension	Extension	Communication
watershed management		Publicity	Motivation
wildlife management			Training
extension			
survey			Reasearch
research			
training)			
Participation	Participation	Participation	Participation
Legislation	Legislation	Legislation	Legislation

(Based on Tables 1, 13, 14, 15, and 16)

Study Procedure

As presented in Chapter I, the basic procedure of this study was to describe and analyze conservation strategies advocated by HMG during 1951 to 1985. The sources of information were governmental, and government authorized documents, and reports. This section of Chapter II brings 12 similar studies together (Tables 18 and 19).

Two studies were doctoral dissertations submitted to MSU viz. the dissertations by Meaders (1957) and Assadollah (1981). The authors developed their respective frameworks in order to focus on the chronological studies. Such frameworks facilitated the researchers to observe the gradual change on the time-scale. Assadollah (1981) used the Iranian Government documents as the primary source of information plus the UN and the other documents as secondary sources. Meaders (1957) used the publications of the selected national organizations and the opinions of the prominent educational leaders.

Studies by Devkota (1980) and Gurung (1982) were similar to each other. The former used HMG budget allocation for transport sector during 1968-1978, and the later used HMG census data for the period 1971-1981. Simple statistics, tables, graphs and maps were used to present their respective works.

IDS (1983) and Chakroff (1979) did similar efforts to describe and analyze conservation strategies of Nepal. In both the works, HMG and other authoritative documents were referred to. IDS (1983) was activity oriented and Chakroff (1979) was information oriented. A paper by Manandhar et al (1982) was not a research work but a country paper describing the forestry extension of Nepal and was presented through the HMG and the FAO. It was an information based article.

Table 18. Selected Study Papers
Author(s), Title, Status and Year

#	Author(s)	Title	Status	Year
1.	Asian Development Bank (ADB)	Nepal Agricultural Sector Strategy Study (Volume I & II)	ADB Study Report	1982
2.	Assadollah, Z.	A Study of Recommendations for Agricultural Education and Agricultural Extension in Iran (1950-1975)	Doctor of Philosophy Dissertation (MSU)	1981
3.	Chakroff, M.S.	Draft Environmental Report of Nepal	Official Report (USAID/MAB)	1979
4.	Devkota, B.	Government Expenditure on Road Transport in Nepal	Research Study (CEDA/TU)	1980
5.	Gurung, H.	Population Increase in Nepal (1971-1981)	Research Study (New ERA)	1980
6.	Huang, Y.; Borthwick, J.; Jamison, D.; Kandel, S.; Roy, S.;and Tillman, J.	Nepal: Development Performance and Prospects	Working Document of the World Bank	1979
7.	Integrated Development System (IDS)	Nepal and ICIMOD - A Draft of Expectations	Working Paper IDS/ICIMOD	1983
8.	Lohani, P.C.	Some Observations on Economic Growth in Nepal	Discussion Paper(NCWA)	1976
9.	Manandhar,P.K.; Pelinck,E.; and Gecolea, R.H.	Extension and Training Components of Community Forestry Development in Nepal	Nepal Country Paper HMG/FAO	1982
10.	Meaders, O.D.	Practices Advocated by Selected National Agencies and Organizations for Implementing Local Programs of Vocational Agriculture, 1836-1954	Doctor of Education Dissertation (MSU)	1957
11.	Poudyal, S.	Planned Development in Nepal	Research Study	1983
12.	Stiller, L.F. and Yadav, R.P.	Planning for People: A Study of Nepal's Planning Experience	Research Study (RCNAS/TU)	1979

The studies by Lohani (1976), Stiller and Yadav (1979), and Poudyal (1983) were analytical in nature. They used government and non-government documents to describe, analyze and review the development strategies (including conservation) of Nepal. The World

Bank report analyzed Nepal's overall development based on the HMG and other publications. It also covered an environmental situation of the country (Huang et al, 1979). The ADB report studied the agricultural strategy (including forestry and soil conservation) of Nepal. The report was based on the HMG, ADB, and other informations and the discussion and review by the HMG and the ADB authorities.

Table 19. Selected Study Papers
Author(s), Sources of Information, and Procedure

#	Author(s)	Sources of Information	Procedure
1.	ADB	Publications by HMG, ADB and other organizations	Review, discussion of draft papers and final reporting
2.	Assadollah	Iranian Government, UN and other authorized sources, published between 1949 and 1978	Review and presentation of government recommendations for agricultural education and extension during 1950-75
3.	Chakroff	HMG publications and other informations available in the US, published in the 1970s	Preliminary review, compilation of environmental informations
4.	Devkota	HMG budget allocation during 1968-1978	Review and analysis of transport sector budget during 1968-78
5.	Gurung	HMG census data (mainly 1971 and 1981 data)	Review and analysis of population changes during 1971-81
6.	Huang et al	HMG and other authorized publications	Review, discussions analysis of Nepal's development and presentation of evaluation framework
7.	IDS	HMG and authorized sources and discussions	Review & analysis of present development strategy related to the environment
8.	Lohani	HMG and other sources and discussions	Review and analysis of Nepalese economy
9.	Manandhar et al	HMG/FAO sources	Description of forestry extension in Nepal
10.	Meaders	Publications of selected national organizations and opinions of the educational leaders	Analysis and comparison of practices and concepts for implementing vocational agriculture program
11.	Poudyal	HMG and other sources	Review & analysis of Nepalese economy
12.	Stiller and Yadav	HMG and other publications and interviews	Review & Analysis of Nepalese economy

CHAPTER III

CONSERVATION STRATEGIES IN NEPAL

Introduction

Format

The purpose of Chapter III is to describe and analyze conservation strategies advocated by HMG in the period since 1951 to 1984. The description focuses on the following seven aspects of the national development plans in regard to conservation strategies: 1. Objectives, 2. Priority, 3. Budget, 4. Organization, 5. Technical Areas for Emphasis, 6. People's Participation, and 7. Legislation.

The above format is presented on the basis of chronological divisions which fit into the national development plans, such as:

Pre-plan	1951 - 1956
First Five-Year Plan	1956 - 1961
Second Three-Year Plan	1962 - 1965
Third Five-Year Plan	1965 - 1970
Fourth Five-Year Plan	1970 - 1975
Fifth Five-Year Plan	1975 - 1980
Sixth Five-Year Plan	1980 - 1985

The period 1961-62 is discussed under the Second Plan period.

Finally, a chronological comparison is made for each of the seven aspects of the plans. For example, the national goals advocated by HMG for each plan period are compared.

National Development Plan

The Planning Commission, formed in 1955 with a view to exploit the resources of the country in a planned manner, drafted the First

Plan (1956-61) (NPC1, 1963:48-49). The Plan was sent to the various departments and ministries which were responsible for the execution (Pant, 1969:166).

The National Planning Council (NPC1), constituted in 1961, was responsible for preparation, approval and implementation of national development plans on the basis of proper studies. In 1968 NPC1 was replaced by the National Planning Commission (NPC). The NPC consisted of the Prime Minister as the ex-officio Chairman, a Vice-Chairman, and four other fulltime members. Unlike its predecessor NPC1, it had essentially an advisory role and was no longer involved in daily execution activities of a plan. Its recommendations acquire the necessary sanction only after they are approved by the Council of Ministers. Within the framework of the approved plan, each ministry prepared a detailed program. These programs were reviewed and revised, if necessary, by the NPC in consultation with the concerned ministry. It also evaluated the implementation and the progress of a plan (Pant, 1969: 167-169).

The above discussion gives a picture of the planning process and the status of the plan itself as a government affair. It is presented graphically in Figure 16.

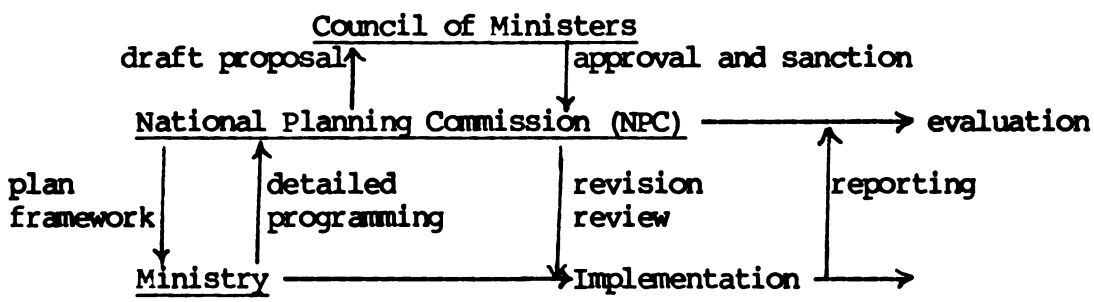


Figure 16. Planning Process of Nepal (1969)
(Based on Pant, 1969:166-170)

Before the establishment of the above pattern of planning, there were numerous changes within the government. For example, the Ministry of Planning and Development was created in 1952. The 1957 Planning Board Act created the Planning Board, and dissolved the Ministry. In 1959 the Board was dissolved but the Ministry was revived. In 1961 the NPC1 was established which was renamed as the NPC in 1968 along with the dissolution of the Ministry of Economic Planning (Pant, 1969: 166-170; and Agrawal, 1976:172,195).

Under the Chairmanship of His Majesty King Birendra Bir Bikram Shaha Dev, the National Development Council was established in June 1972. The Council consisted of the political leaders from the district chairmen to the ministries and others. It directs the NPC with regard to basic policies and effective implementation of the Plan (Stiller and Yadav, 1979:209-211).

The ministries and the departments also formed their individual planning cells within their organizational structures, such as the Planning Cell of the MFSC, the Survey and Planning Section of the DSCWM, and the Planning and Development Section of the DF (DF,1978: 77 and 81; and DSCWM, 1982:21). Under the basic principles as developed by the NPC and as approved by the National Development Council, the departmental plans are prepared by the concerned field or project staff in cooperation with the departmental planning staff. Such departmental plans are revised and coordinated by the ministerial planning cell and finally submitted to the NPC for the final approval and sanction. The NPC also issues annual strategies and priorities among the ministerial plans. It also sponsors seminars on planning (Stiller and Yadav, 1979:211).

In the panchayat sector of the plan, the village and district panchayat plans are prepared by the concerned panchayat committees, according to the 1982 Decentralization Act. However, the NPC supports, examines and approves such plans (IDS, 1983: 53-54, and Shrestha, B.P., 1981: 266-274). Moreover, the conservation plans of the DSCWM are subjected to be discussed in the respective conservation committees at the district and the village level (DSCWM, 1982:34-35).

The above discussion gives a picture of the national development plans which are controlled, supported and authorized by HMG. Hence, any activity within the plan has its bearing on the unified effort towards national development. It is also clear that the beneficiaries can participate in planning on the basis of the 1982 Decentralization Act, the 1982 Soil and Watershed Conservation Act, and the 1980 Panchayat Forest (First Amendment) Rules. But the plan as such was finally to be approved by the NPC for the government support in terms of finance, technical know-how, and materials etc. Thus, this study focuses on the strategies advocated by the government in the plans.

Conservation Strategy 1951-1956

On February 18, 1951 the century old Rana autocracy ended in Nepal. This political upheaval brought a new life for the Nepalese who used to be treated as the passive subjects of the Rana rulers. The 1951 Interim Government of Nepal abolished the evil practices such as the forced labor and traffic in human beings.

Objectives/Priority

The period 1951-56 passed without any systematic development plan for the country. However, there were a few initiations towards planned

development in the country. In 1952 the government proposed development programs with high priority on roads, airports, postal service, radio, education, and industry (Mihaly, 1965:26). During this pre-plan period suggestions were proposed by the experts. For example, the advisor of the US Technical Cooperation Mission to Nepal, Paul W. Rose gave ten-point development program in which forestry was sixth among the ten priority items (Mihaly, 1965:30-31).

Budget

The Nepal Gazzette (Vol. I, No.26) published government budget and expenditure for the years 1950-51 and 1951-52 (Joshi and Rose, 1966:162). The portion of the budget for the forestry sector could not be made available.

Organization

Under the Rana-Congress Coalition Government of 1951, the MF was one of the ten ministries, and was headed by the Rana representative (Gorkhaptra, February 16, 1951 as cited by Agrawal, 1976:157). In 1951 a new organizational plan was adopted to divide the forests of Nepal into 2 circles, 9 divisions, 36 ranges and 180 beats. By 1952 there was the Ministry of Forests and Revenue, and it had two conservation related departments viz. Forests and Botany. The FAO forestry expert, Ernest Robbe (1954: 56-59) proposed to completely reorganize the Forest Service. He proposed three "conservations", with 6 to 12 divisions in each "conservation", 5 ranges in each division, and 6 beats in each range. In 1955 the post of Chief Forest Officer was established to lead the DF (DF, 1978:10).

On the training aspect, the Three Year Plan document (NPC1, 1963: 141) mentioned that the forestry institute was started in 1947 and

transferred to the Singh Durbar Secretariat, Kathmandu in 1951, but remained closed until 1956. But the 1976 National Forestry Plan document mentioned that the rangers school was organized around 1951 (DF, 1978:7).

Technical Areas for Emphasis

Robbe (1954: 42) noted that trees were marked and sold during 1950-51 season according E. A. Smithies' Plan of 1941-47. He also mentioned that timber marking lists were drawn up in 1952-53 by the Kathmandu authorities of forestry and in 1953-54 by the circle officers. The FAO Mission was established on July 27, 1951 for the purposes of advising the government on two areas, such as:

i) to establish a longrange forest policy, legislation for implementation, organization of forest services, and training the forestry personnel
ii) to advise the government on forest protection, reforestation, soil conservation, and management and utilization of forests

The Nepalese forestry was led by P. D. Ratauri for the period 1947-52. The political disorders during the early 1950s upset everything including the forest working plans and the logging operation. The 1976 National Forestry Plan also noted that forest demarcation was discontinued in 1950 (DF, 1978:10).

Robbe (1954:5-6) carried out a preliminary survey of the forest conditions and soil erosion problems in the selected areas such as the western hills, the Terai and Kathmandu.

There were 47 rangers and 56 foresters trained until 1956 i.e. the beginning of the First Plan. These figures are calculated from the two sources viz. the existing technicians for the Second Plan and the output of the First Plan (Table 20).

Robbe's (1954:13-14, 27-37, 60) report gave a picture of the

forestry activities of 1950-54 in Nepal. He gave five major areas for emphasis: soil conservation, reforestation, forest management, forest utilization, and study of other countries. Specifically, he proposed 12 points to initiate the forestry works in Nepal, such as survey, mapping, delimitation of land-use, control of shifting cultivation, reforestation, people's need fulfillment, extension/education, demonstration, formal education, grazing control, and soil conservation. He also strongly recommended to implement Smithies's Plan to begin with.

Table 20. Trained Personnel in 1956 and 1961

Personnel	Before Second Plan (1961)	First Plan Output (1956-61)	Before 1956
Foresters	135	79	56
Rangers	70	23	47
Specialists	37	..	..

(Source: NPC1, 1963:56, 232)

People's Participation

The 1951 Interim Constitution of Nepal abolished the traditional Rana systems. One of the striking features of the constitution was abolition of forced labor and traffic in human beings, according to its Article 19 (Agrawal, 1976:150). The compulsory unpaid labor, called "Jhara", was the obligation of the entire adult male to the state or to the Rana rulers. According to Regmi (1971), the main purpose of Jhara was to transport arms, ammunition, military supply, and to relay postal service, to reclaim wasteland, to build irrigation channels, to control floods, to maintain bridge, to capture wild elephants for the palace, to supply fodder for the royal elephants, to supply forest products and other materials to the palace, to contribute unpaid porterage and so on.

Robbe (1954:26-37) strongly emphasized the need of people's participation in forestry (conservation) works. The strategies he suggested were to impart responsibility of controlling shifting cultivation to the villagers, to educate, to demonstrate, to train, to reward, and to financially support. His report thus revealed that in 1951-54, there was a potential of people's participation in conservation.

During 1951-56 the indigenous system of forest and pasture management was in practice. Furer-Haimendorf (1975: 11-12, 97) described the Shingo naua system of the Sherpa community. (A Shingo naua is a forest guard selected and authorized by the assembly of the local community. A Shingo naua used to control and regulate the forestry works e.g. grazing, lopping, and firewood gathering.)

Similarly, the Nuwakot dwellers used to control fire in the surrounding forests. The priest of the temple used to keep watch over the forests. In case of fire in the forests, he used to ring a bell. The villagers immediately responded the bell and carried out necessary actions. Allocation of grazing land, construction of river embankments, plantation of shade trees along the trails, and similar other conservation oriented works were at one time considered social welfare and religious matters.

Legislation

Robbe (1954:13) recommended the promulgation of scientific forest laws instead of then existing forest laws. His suggestions covered policies on land-capability, land-use, private and public properties. These suggestions were derived from the Sixth Session of the FAO Conference held in Rome in December 1951 and the then India's Forest

Policy.

Conservation Strategy 1956-1961

Objectives

The First Five Year Plan drafted by the Planning Commission formed in 1955, came into effect in 1956 until 1961 (NPC1,1963:48-49). The main objective of the First Plan, as quoted by Pant (1965:48), was "to raise production, employment, standard of living, and general well being throughout the country". The essence admitted by the First Plan was "simultaneous advance on all fronts".

The objective was very general and could be applicable for the forestry component of development as well. For example, the objective could be generalized to raise forestry production, and employment in forestry. But it did not specifically reflect forestry development. On the other hand Pant (1965:53) noted that a commission for forest demarcation in the Terai should be immediately deputed because the Terai forest land could be turned over for colonization. The remark demonstrated that the objective of forestry development was more toward the colonization purpose.

Priority

The order of priority given by the First Plan was as follows:

I Transport and Communication

II Agriculture and Allied Subjects

III Social Services

IV Other Development Programs (Source: NPC1, 1963:49)

NPC1 (1963:55-56) document discussed forestry with agriculture and irrigation. But forestry was included in the sector of irrigation and power, as shown by Pant (1965:51-52). However, Pant (1965:53)

again described forestry along with the agricultural sector. The order of priority for forestry was second when considered as a part of the broad agricultural sector.

Budget

The total estimated budget for the First Plan was Rs. 330.0 million and for forestry component, Rs. 20.0 million (NPCl, 1963:52; and Pant, 1965: 52). The actual total expenditure of the plan was only Rs. 214.5 million, which was 65% of the estimated figure. The actual expenditure of agriculture and forestry combined was only Rs. 6.9 million (NPCl, 1963:52). The separate figure for the forestry component could not be made available. The estimated budget for the agriculture component was Rs. 12.0 million (Pant, 1965:52). Thus actual expenditure for agriculture and forestry combined was only 3.24% of the actual total expenditure (Table 21).

Table 21. Budget of the First Plan (1956-61)

Area	Estimated Allocation		Actual Expenditure	
	Rs. million	%	Rs. million	%
Agriculture	12.0	3.6	...	..
Forestry	20.0	6.1	...	..
Subtotal	32.0	9.7	6.9	3.24
Total Plan	330.0	100.0	214.5	100.0

(Source: NPCl, 1963:52; and Pant, 1965:51-52)

Organization

The first step taken under the First Plan was to systematize the forestry organization by dividing the forests into 7 circles running from north to south and comprising of 13 and 9 divisions in the Terai and in the Hills respectively. The division was further split up into ranges and the range into the beats. Yet two third of the hills were

beyond the purview of the forest service (NPC1, 1963:231-232).

In 1958 forestry was reorganized by merging the Office of the Chief Forest Officer into the MF. The five directors of the MF began controlling the forests. But after a few months, problems arose in that management, and again the DF was reconstituted in 1959. The 1959 reorganization revived the original 7 circles and 22 divisions. The CCF was at the top of the department, a conservator of forests in each circle, and a divisional forest officer in each division.

The TCN was established in 1959. In 1960 the change-over from the Parliamentary Democracy to the Panchayat System brought about policy shifts in the political setting (Shrestha,M.K., 1969:6-7). In 1961 the government bodies were reorganized and as a result the Ministry of Forests and Agriculture was formed along with 13 other ministries. Shrestha, M.K. (1965:27) noted that the Ministry of Forests and Agriculture had four departments viz. Agriculture, CCF Office (Forests), Food , and Botany.

The 1976 National Forestry Plan document mentioned that, in 1961 the CCF Office was expanded into five major sections such as forest development, forest utilization, forest research, wildlife management, and plantation. The Forest Resources Survey Office was established in 1961 (DF, 1978:8). In 1961 the Botany Department was renamed as the Department of Medicinal Plants. It had five sections viz. Royal Drug Research Laboratory, Royal Botanical Garden, Herbal Farms, Botanical Survey, and Trading Centers (NPC1, 1965:81).

The Institute of Forestry (also called forestry school) was reopened in 1956 and transferred to Hetauda in 1959, from where it shifted to Bhimphedi (NPC1, 1963:141). During the First Plan period,

the Rural Institute was established in Rapti valley in order to give training in health, forestry, and village development.

Technical Areas for Emphasis

In spite of the frequent organizational changes in the forestry component, the First Plan initiated several technical works in conservation, as given in Table 22.

Table 22. First Plan Progress on Conservation

#	Items	Unit	Number
1.	Reforestation	ha	61.5
	(i) Nursery	ha	8.1
2.	Forest Management		
	(i) Demarcation	km	153
	(ii) Fireline	km	79
	(iii) Paths	km	58
	(iv) Buildings	number	28
3.	Wildlife Management		
	(i) Deer sanctuary	number	1
4.	Survey (Office established)		
5.	Research Experimental Plot	ha	518
6.	Extension Service		
	(i) Saplings distribution	number	1800
	(ii) Forest Festival (Ceremony)		
7.	Training		
	(i) Rangers	person	23
	(ii) Foresters	person	79
	(iii) Specialists	person	..

(Source: NPC1, 1963:58)

In Table 22, item 3(i) indicated the establishment of the King Mahendra Deer Sanctuary in Chitwan. The Second Plan document mentioned the observance of the Forest Festival by the government (NPC1, 1963:233). This indicated that the Festival was initiated in the First Plan period. The item 7(iii) although not showing any figure was included in order to indicate that such training existed (probably abroad). During and before the First Plan, there was an arrangement for the forestry training abroad. The number of agriculture and

forestry technicians trained abroad during 1957-61 is given in Tables 23 and 24. A separate figure for the forestry component could not be made available.

Table 23. Personnel Trained Abroad (1961) Countrywise

Country	India	USA	USSR	United Kingdoms	Others	Total
Number	268	39	5	2	59	373

(Source: NPC1, 1963:136-137)

Table 24. Personnel Trained Abroad (1957-61) Yearwise

Year	Upto 1956	1957	1958	1959	1960	1961	Total
Number	116	32	54	50	46	75	373

(Source: NPC1, 1963:136-137)

People's Participation

The sapling distribution and the Forest Festival were efforts to involve local people in afforestation and other conservation works. However, Furer-Haimendorf (1975: 11-12, 97) observed that the indigenous conservation efforts of the people e.g. the Shingo naua system disappeared in the late 1950s when the government nationalized the forests and changed the organization to manage them.

The Plan as a whole was drafted by the Planning Commission established in 1955. According to the Second Plan document it (the First Plan) played a role in making the people conscious (NPC1, 1963: 49). The same document mentioned that the people did not have anything to say in the formulation of the program which was imposed on them from above, and that it did not touch off enthusiasm and cooperative spirit among them (NPC1, 1963:104). In the agriculture sector, 378 cooperatives were established under the First Plan in order to kindle a sense of participation (NPC1, 1963:55). In overall, people's

participation in conservation was not seriously considered during the First Plan period (1956-61).

Legislation

By enacting the 1957 Private Forest Nationalization Act the government nationalized all kinds of private forests without any compensation. Its Section 2.1.a excluded fruit orchards, and individually raised patch of forests (1.3 ha in the hills, and 3.3 ha in the Terai) (LBMC,1983 :143-144).

The 1958 Wildlife (Protection) Act contained 17 Sections and its main features were prohibition of hunting wildlife without licence, procedure of obtaining such licence, and prohibition of exporting or moving wild animals (Shaha, 1970:Appendix I).

Another landmark in forestry legislation was the promulgation of the 1961 Forest Act. The main features of the Act were as follows:

- declaring the adjoining forests and the fallow land left for 2 or more years as the government forests
- declaring illegally cultivated land inside the government forests as part of the government forests
- protection of government forests
- control over trading forest products
- government claim over driftwood
- repeal of the Rana time forest laws e.g. Timber Removal Section, Forest Inspection Rules, National Forest Utilization and other ad hoc rules and circulars.

(Source: LBMC, 1983:146-171)

The 1956 Land Act fixed the rental, levy and interest payable by the farmers. The 1959 Birta Abolition Act did away with system of Birta (tax exempt lands) (NPC1, 1963:69-70). Chakroff (1979:31-32) also listed the following three Acts related to the environment: 1. the 1956 Ancient Monument Protection Act, 2. the 1956 Export Import (Control) Act, and 3. the 1961 Land Acquisition Act.

Conservation Strategy 1961-1965

Objective

The primary objective of the Second Plan (1962-65) was to develop the basic infrastructures required for sustained development. In addition to this primary objective, the Plan laid down four long-term socio-economic objectives such as:

1. Expansion of national production in agriculture and industry
2. Maintenance of economic stability (e.g. price control)
3. Expansion of employment opportunities by promoting "labor-intensive" projects, and
4. Establishment of social justice by promoting agrarian reform and social services (Source: NPC1, 1963:1-6)

The above objectives indirectly related to conservation such as the reference to increased production and expansion of employment opportunities. However, they did not clearly reflect the importance of conservation of natural resources.

The forestry section of the Second Plan document emphasized the discreet use and scientific conservation of forests. The section clarified that there had been an irregular and uncontrolled use of forests such as the contract system and unrestricted grazing (NPC1, 1963: 230-231). The other directly related sector was resettlement. It had an objective of rehabilitation (by clearing the Terai forests) of the peasants who were thought to destroying the hill forests (NPC1, 1963:225). Thus the Second Plan objectives did not have a strong policy of conservation.

Priority

The priority in the Second Plan were attuned to the main objectives. Thus the top priority was assigned to the projects which provide basic knowledge of the national economy, which affect reforms in organizational structure, and which build infrastructure. The less

prioritized projects were those which aim to promote agricultural and industrial production, and which consolidate the system of social services. Emphasis was given to a better system of data collection including a survey of country's physical resources. High priority projects also included training personnel to fulfill the man-power requirements (NPCl, 1963: 6-10).

In the above order of priority, conservation was not among the top items. In the financial resources allocation of the Plan, Agriculture, Irrigation and Forestry combined received fourth priority among five major sectors (NPCl, 1963:25).

Budget

The total estimated and actual expenditures of the Second Plan were Rs. 600.0 million and Rs. 596.81 million respectively. The forestry and botany component budget was estimated as Rs. 13.4 million and the actual expenditure was Rs. 14.6 million (Table 25).

Table 25. Budget of the Second Plan (1962-1965)

Item	Estimated Allocation		Actual Expenditures	
	Rs. million	%	Rs. million	%
Forestry & Botany	13.40	2.23	14.60	2.45
Plan Total	600.00	100.00	596.81	100.00

(Source: NPCl, 1965:3)

As shown in Table 25 forestry and botany component comprised of only 2.45% of the total budget. The increase in actual budget was due to inclusion of survey and training expenditures which were separately estimated in the Plan. The budget for resettlement and similar indirectly related components was not incorporated with the forestry and botany component.

Organization

The MF was separated from the Ministry of Forests and Agriculture in 1965. The departments under the new Ministry were the CCF Office, and the Department of Medicinal Plants (Shrestha, M.K., 1975:60). The respective sections under the departments were also automatically transferred. In 1964 the Nepal Resettlement Company was formed in order to carry out rehabilitation programs in a systematic and organized manner, and to handle big projects which plan for thousands of families (NPC, 1972:63).

Technical Areas for Emphasis

The target and progress of the forestry sector in the Second Plan are shown in Table 26.

Table 26. Target and Progress of Forestry Sector (1962-65)

# Items	Unit	Target	Progress	% Progress
1. Reforestation	ha	4049	2454	61
2. Forest Management				
(i) Demarcation	km	7944	3840	48
(ii) Fireline	km	634	448	71
(iii) Paths	km	39	480	1231
(iv) Buildings	number	571	...	..
3. Wildlife Management				
(i) Wildlife Refuges	site	3	3	100
4. Survey	division	3	..	..
5. Training				
(i) Rangers	person	50	112	224
(ii) Foresters	person	150	214	143
(iii) Specialists	person	6	18	300

(Source: The Three Year Plan and the Third Plan Documents)

Progress of the buildings (item 2.iv) could not be made available. The wildlife refuges (item 3.i) at Chitwan, Kanchanpur, and Biratnagar were established. The aerial and other survey initiated in the Terai divisions and in the hills. Soil survey for agriculture and

water survey for irrigation were also carried out during the Second Plan period. Similarly, botanical, mineral, industrial, town planning, airports and roads were also the programs envisaged in the Plan.

Abrogation of the contract system and initiation of working plans in the Terai were also important steps during 1962-65. Herbal development and other related works were also carried out.

People's Participation

The panchayat sector was introduced in the Second Plan in order to promote people's participation in overall development including conservation. The procedure of the panchayat sector as mentioned in the Second Plan document was as follows:

(i) The local panchayat would apply for the departmental projects according to the departmental prescriptions
(ii) The local panchayat could also apply for the financial supports for the projects within the government priority
(iii) The local panchayat could freely frame and implement the programs which were to be implemented only through the local resources

And, one of the activities of a village panchayat was to plant trees. (Source: NPCl, 1963:105-106).

In the beginning, the document of the Second Plan stated that the panchayat system had been adopted for the purpose of enlisting active participation of the entire populace in the execution of the plan and to mobilize the latent energy of the people (NPCl, 1963:1). In the forestry section, it stated that the hill forests would be handed over to the care and management of the local panchayats (NPCl, 1963:231). But the records of implementation of this policy could not be found.

The policies mentioned in the main objective and in the panchayat sector indicated that people's participation was sought at the implementation level. The projects were formulated and prioritized by

the policy makers. The local people did not seem to have control over the government funded or assisted projects.

The Forest Festival, as stated in the plan document, was observed by the government as a part of the campaign to focus the attention of the people on the need of afforestation (NPC1, 1963:233). The program appeared to be the fundamental step towards securing people's participation in conservation. But the Plan did not formulate any target and strategy for that.

Legislation

The Second Plan stated that necessary reforms would be introduced in the existing forest regulations (NPC1, 1963:231), but only minor amendments of the Acts were promulgated. The amendments of the 1961 Forest Act were conversion of few words into simple Nepali words. The amending Acts were the 1963 Nepal Laws (Amendment Revalidation) Act, the 1964 Judicial Administration (Miscellaneous Arrangement) Act, and the 1965 Local Administration Act (LBMC, 1983:146-171).

The 1962 Wildlife (Protection) (First Amendment) Act changed several items including addition of Section 11A which empowered to shoot the offender(s) below the knee, and the removal of five animals from its Schedule 1. The 1964 Nepal Laws (Amendments Revalidation) Act changed few words into Nepali. The government banned exports of certain wildlife and its products by publishing the 1965 Notification of the Ministry of Forests and Agriculture (Shaha, 1970:65-79).

The other related Acts promulgated in 1962-65 were as follows:

1. The Village Panchayat (Representation) Act, 1962 (One of the activities of a village panchayat was to plant trees) (NPC1, 1963:106)
2. The Town panchayat Act, 1962 (Its activities included the provision of safe clean drinking water and other services to the people)

3. The Land (Survey and Measurement) Act, 1963. (survey, measurement and grading of land)
4. The Export Import (Control) Rules, 1963
5. The Highway (Construction Arrangement) Act, 1964 (acquisition of land for highway construction)
6. The Mills Act, 1965 (pertained to the location and operation of the mills including sawmills) (Chakroff, 1979:15-32)

The basic features of the 1964 Land Act were the ceiling on the land ownership, tenant's security, abolition of "Jimindary" (estate), and the compulsory savings (Zaman, 1973).

Conservation Strategy 1965-1970

Objective

The social objectives of the Third Plan (1965-70) were derived from the Constitution of Nepal and were originated with the First Plan in 1956. the main elements of the objectives were welfare, justice, and equal opportunities. The Third Plan also had as a primary objective to develop the prerequisite for rapid economic growth. Similarly, it had six general objectives:

1. Agriculture Production: to boost food production by introducing modern techniques in agriculture
2. Institutional Reform: to improve the condition of tillers by effectively implementing the land reform program
3. Economic Infrastructure: to develop transportation and power in order to increase agricultural output and to promote market system
4. Industrial Development: to promote public and private industries through financial and technical assistance
5. Foreign Trade: to promote trade diversification by developing agriculture and industry
6. Social Justice: to allocate the benefits of economic growth and social services to large number of people, to introduce land reform, the Mulki Ain (the social justice Act) and so on. (Source: NPC1, 1965:11-12, 15-17)

The above objectives (social, primary and specific) did not clearly envisage conservation of natural resources. The importance of the role of conservation has to be assured in the above objectives.

For example, one prerequisite for rapid growth is conservation of natural resources, and likewise it has its bearing on agriculture and industry as well.

The concept of regional development planning was brought by Gurung (1969) in order to gradually eliminate regional desparity in the Terai, Kathmandu, and the rest of the country. The operational aspect of the concept gave importance to the balanced utilization and conservation of the natural resources. The whole concept was based on the ecological divisions of the country. Okada's (1970) report contained fairly detailed technical outline of the regional development concept.

Priority

The order of priority in the Third Plan was as follows:

I Agriculture (including forestry)

II Transport and Power

III Industry (Source: NPC1, 1965:17-18)

But according to the allocation of the public sector expenditure, the agricultural sector got only second priority following the sector of transport, communication and power (NPC, 1965:23).

The agricultural sector included resettlement, land reform, cadastral survey, food, panchayat cooperatives, forestry, medicinal plants, and irrigation. However, as a main ingredient of agricultural development, forestry and medicinal plants were not listed among the other items (NPC1, 1965:17). The industry sector at least mentioned that its development depend on transport and power, and on the availability of raw materials and other resources.

Again, soil conservation was attached to irrigation among the

five major areas of agricultural development, such as irrigation and soil conservation, improved seeds, fertilizer, crop protection, and improved techniques (NPC, 1965:57-58). Thus although not mentioned in the priority items, conservation was considered necessary in the Third Plan.

Budget

The data in Table 27 give the budget allocation and the actual expenditure of the Third Plan and of the forestry sector in the Plan.

Table 27. Budget of the Third Plan (1965-70)

# Items	Allocation Rs. million	%	Actual Expenditure Rs. million	%
Forestry	45.0	2.59	...	..
Medicinal Plants	7.5	0.43	...	..
Plan Total	1740.0	100.00	1779.1	100.00

(Source: NPC1, 1965:23; NPC, 1972:9)

A separate budget for the soil conservation component of agricultural development could not be made available. The above budget was also for the training of forest technicians. But the man-power required for the medicinal plant development did not include in the above mentioned budget. Tribhuvan University, founded in 1959, started a Master of Science in Chemistry, Biology, and other fields during the Third Plan period. So expenditure on training could not be explicitly presented.

Organization

The Third Plan document aimed to improve and strengthen the organization and administration of the forestry department (i.e. the CCF Office) (NPC1, 1965:81). In 1967 the CCF Office was expanded into 14 circles and 75 divisions in order to respectively match 14 zones

and 75 districts according to the general administration. But the scheme reverted back after a few months to the original 7 circles, and 22 divisions due to lack of manpower. The same year, the autonomous Office of the Bagmati Zone Afforestation Scheme was established under the CCF Office. In 1969 a drastic change in forestry organization occurred when the Pradhan Van Karyalaya (Major Forest Office) system was adopted (DF, 1978:8-9).

According to the American Embassy reports (1967:22 and 1969:9), the CCF Office had four sections viz. Forest Resources Survey, Assistant CCF, Forest Development, and Forest Utilization in 1967. Whereas in 1969 the sections added were wildlife, administration and hunting, but the section of utilization did not appear.

The Forest Products Sales and Distribution Corporation was formed in 1968 (Nepal Gazzette, June 24, 1968) and HMG dissolved it again in 1969 (Nepal Gazzette, February 10, 1969). Thus the Third Plan experienced several strategic organizational structures, which demonstrated an experimental effort.

Technical Areas for Emphasis

The target and progress of the forestry sector of the Third Plan are given in Table 28. The actual figures for target and progress of buildings (item 2.iv), extension (item 5), and research (item 7) could not be made available. The target of working plans (item 2.v) was not clearly mentioned in the Third Plan, but the Fourth Plan document noted that they were implemented in four divisions viz. Birgunj, Biratnagar, Kanchanpur and the TCN area (not a specific division) (NPC, 1972:109). Preliminary soil conservation works and survey in the Trishuli Watershed were started. In July 1969 six Royal hunting

reserves in the Terai and one in the mountain were gazzetted for the protection of wildlife. But in the absence of proper legislation and bylaws the conservation of wildlife remained ineffective. In December 1970 two national parks viz. Royal Chitwan and Langtang were established (Upreti, 1979: 7-8). The survey program (item 6) covered a wide area and subjects e.g. forest survey in the Terai and the hills, soil survey in five divisions of the Terai viz. Chitwan, Birgunj, Janakpur, Banke and Bardia, and preliminary botanical survey throughout the country (NPC, 1972:109-110).

Table 28. Target and Progress of Forestry Sector (1965-70)

# Items	Unit	Target	Progress	% Progress
1. Reforestation	ha	10121	4150	41
2. Forest Management				
(i) Demarcation	km	4000	1493	37.3
(ii) Fireline	km	480	237	49.4
(iii) Paths	km	1200	547	45.6
(iv) Buildings	number	as required		
(v) Working Plan	division		4	..
3. Watershed Management				
(i) Soil Protection	ha	selected areas		
4. Wildlife Management				
(i) Parks	site	2	2	100
(ii) Reserves	site	..	7	..
5. Extension Service				
6. Survey				
7. Research	station	3	..	..
8. Training				
(i) Rangers	person	175	61	34.9
(ii) Foresters	person	350	96	27.4

(Source: NPC1, 1965:80-81; and NPC, 1972:109)

Notably, the conservation program was included in agricultural development, e.g. soil conservation with minor irrigation works was targeted to cover 21,400 ha. in order to protect soil, and pasture development to encourage sheep farming (NPC1, 1965: 557-58, 62). Similarly, the Nepal Gazzette (August 18, 1969) published the HMG

decision of June 5, 1969 to protect the forests in Hetauda to conserve water sources for commercial fish farming.

The forestry and all other man-power available at the end of the Third Plan is compiled in Table 29. It gives a glimpse of the strength of the forestry sector in terms of man-power which was a very low percent of the total man-power in the technical field.

Table 29. Forestry and Other Technical Man-Power in 1970

Subject	High Level		Middle level		Lower Level		Total	
	Number	% of all	Number	% of all	Number	% of all	Number	% of all
Forestry	99	1.29	231	30.35	360	8.31	690	5.42
All(a)	7648	100	761	100	4333	100	12742	100

Note: All(a) includes forestry technicians
(Source: NPCl, 1972:27 and 28)

In summary, although much efforts were spent in forestry sector, the actual conservation output was not promising. Progress was not achieved to its maximum.

People's Participation

The forestry extension program of the Third Plan aimed to avoid forest depletion by stimulating village interest in forest protection and by educating them on modern plantations. The medicinal plant program aimed to provide financial and technical assistance to encourage the people to grow medicinal plants (NPCl, 1965:81). These policies reflected the intention that the people should be involved at the implementation level of conservation programs.

The panchayat sector of the plan stated

> "to orient traditional thinking patterns, and promote self reliance, and create a sense of cooperation to achieve the goals of national development" (NPCl, 1965:90)

> "the mobilization of labor and other resources through the panchayat sector is extremely important for social and

> economic development. ...greater authority will be given to the panchayat organizations. ...major responsibilities will be given to the zonal, district and gram(village) panchayats" (NPC1, 1965:20)

The above statements indicated that the local people would be involved in development works through panchayat organizations. The importance given to the "mobilization of labor" indicated that the level of participation would mainly be at the implementation level. Nevertheless, the development activities to be conducted through the panchayat sector listed agriculture, irrigation, education, building construction, road construction, cottage industries, and drinking water projects (NPC1, 1965:19). The list did not have any conservation program.

On the basis of the principle that the common desires of the people can be conceived of only from below rather from above, Shrestha, B.P. (1966:285-286) proposed that planning first be started at the village, be passed through the district and zonal levels, and the final decision be made at the national level. Shrestha, B.P. (1966:290) also observed that "a very large potential supply of free and volunteer labor power can be harnessed for local development works". The analysis clearly indicated that people's participation would be sought only at the implementation level.

A notable landmark in the people's participation was the "Go to Village" National Campaign of 1967, which included afforestation as the yardstick of political leaders' activities. One of its ten basic guidelines was "to acquaint the people with the importance of conservation of forests and wildlife". There were eight further guidelines to elaborate the above basic guideline (Shah Dev, His Majesty King Mahendra Bir Bikram, 1971:51, 59-60)

Legislation

The 1967 Forest Protection (Special Arrangement) Act was enacted in order to protect the forests from encroachment. It will be in effect until the last day of Chaitra, 2043 (mid-April 1987). The First Amendment in 1970 amended Section 7 which empowered the Forest Protection Official to shoot the offender(s) below the knee LBMC, 1983 :172-180). Information on the 1968 Panchayat Rules could not be made available.

The 1970 Hunting Rules were promulgated according to the power conferred by the 1958 Wildlife (Protection) Act as amended in 1962 (Shaha,1970:80-109). The 1970 Forest Products (Sales and Distribution) Rules were promulgated to control forest harvesting (Chakroff,1979: 20). The Second Amendment of the 1962 Wildlife (Protection) (First Amendment) Act was promulgated in 1967 by changing and adding Sections regarding penalties, punishment, and by including the Impeyan Pheasant in Schedule 1 of the protected wildlife (Shaha, 1970:71-77). The 1967 Nepal Laws (Amendment) Act changed few words into Nepali terms in the 1957 Private Forest Nationalization Act and the 1961 Forest Act.

Chakroff (1979:13-15, 27-33) noted several conservation related legislation enacted during the Third Plan period as follows:

1. The 1966 Nepal Mines Act empowered HMG to own all kinds of mineral deposits and resources
2. The 1966 Water Tax Act (no information made available)
3. The 1967 Export Import (Control) Rules banned such items as cows, bulls, rhino-trophies, boulders etc. to export.
4. The 1967 Land (Survey and Measurement) Rules
5. The 1967 Irrigation, Electricity and Related Water Resources Act repealed the 1961 Irrigation Act and the 1963 Electricity, Motor or Power (Transfer and Removal) Act.
6. The 1968 Highway (Construction Arrangement) Rules.

Conservation Strategy 1970-1975

Objective

The basic objectives of the Fourth Plan (1970-1975) were consistent with the Panchayat system and the guiding principles of the Constitution. They were as follows:

1. To maximize output i.e. to increase production in order to create society free from exploitation
2. To establish the base for sustained and longterm economic growth (viz. transport, communication and power)
3. To expand and diversify international trade for economic development
4. To secure accelerated pace of development with maximum stability by controlling price level
5. To make effective use of man-power resources and to control population growth
6. To create conditions conducive to the emergence of a society free from exploitation (Source: NPC, 1972:1-3)

Among the above stated objectives, population control was somewhat related to conservation. However, the objective was stated on the grounds that cultivable land was limited. Consistent with the maximization of output, one of the agricultural programs was reclamation of additional cultivable land (NPC,1972:42). The Plan objective did not emphasize the role of conservation in maximization of output or in sustained economic growth. The forestry sector of the Plan, however, had as its sectoral objective to conserve and develop the forest resources in order get the maximum benefits (NPC,1972:110). The sectoral objective of forestry was not applicable in the other sectors e.g. agriculture, transport and industry.

The concept of regional development and growth axes reflected the Plan's consideration of ecological diversity of the country and that of conservation of natural resources (NPC,1972: 281-291). The concept was brought by Gurung (1969) and elaborated in terms of resource allocation (Rana, P.S.J., 1973:17-21), administrative implications

(Pradhan, G.B.N., 1973:42-46), organization (Pradhan,P., 1973:47-61), socio-economy and politics factors (Sainju, 1973:97-100).

Priority

The order of priority in the Fourth Plan was as follows:

I Transport and Communication

II Agriculture (including forestry)

III Industry and Power

IV Social Services

In addition to the above priority order, the Plan also gave general priority to the continuing projects started during the Third Plan or to those projects related to foreign aid (NPC, 1972:10-11).

The sector with top priority, transport and communication, laid down its sectoral objectives covering socio-economic and political significance in the national development. Similarly, the sectoral objectives of agriculture focused on economic aspects e.g. level of consumption, purchasing power, savings, exports, and industrial raw materials. The objectives of the industry and power sector gave its importance to forest based industries and to utilization of water resources. The tourism industry emphasized development of facilities in the national parks. Among the sectors with low priority, social services, the proposal for developing science education was fairly close to conservation (NPC, 1972:194, 214, 226, 245). Forestry was also a part of agriculture sector as mentioned in the allocation of expenditures (NPC, 1972:11 and 12).

Budget

The data in Table 30 give the budget allocation for the forestry and medicinal plants sector, and the total plan budget during 1970-75.

Table 30. Budget of the Fourth Plan (1970-75)

Items	Allocation Rs. million	%	Actual Expenditure Rs. million	%
Forestry	61.1	1.73	...	..
Medicinal Plants	19.7	0.56	...	..
Plan total	3540.0	100.00	...	..

(Source: NPC, 1972:12-14)

The above allocation of budget for forestry and medicinal plants was solely in the public sector only. The Plan total was the grand total of the public, panchayat and the private sectors. The total plan budget in the panchayat sector was Rs. 120.0 million, in the private sector was Rs. 870.0 million and in the public sector, Rs. 2550.0 million. There was no specific budget for forestry in the private and the panchayat sectors. In the private sector, the forest based industries to be set up during the Plan were pulp and paper, saw mills, plywood, and pharmacy. These were class C industries with low investments. (There were other 19 class A, 1 class B, and 11 class C industries that were proposed). Thus the conservation projects were primarily financed by the government, i.e. the public sector only.

Organization

The Resettlement Department was established in the early 1970s. Its aim was to carry out small-scale resettlement programs (involving less than 200 families) through the Zonal Resettlement Committees. The large-scale resettlement programs were under the responsibility of the Nepal Resettlement Company (NPC, 1972:63).

In 1971 the Nepal Forestry Institute was renamed as the Institute of Forestry and transferred to TU (DF,1978:9-10). In 1972 a commission was formed to regulate haphazard settlements in specified areas of Sarlahi district (in the Terai) (Nepal Gazzette, February 28, 1972).

In 1973 the autonomous Office of National Parks and Wildlife Conservation was established under the CCF Office. In 1973 and 1974 two more forest divisions were created, viz. Surkhet and Karnali (DF, 1978:9-10).

In 1974 the DSWC was established under the MF. It had three divisions viz. engineering, agriculture and forests, and four sections viz. survey & planning; training, research and publicity, administration; and account (WMCEP, 1982:15 and 21).

In 1975 a three member commission was formed in order to conduit enquiries and submit a report within 5 weeks to HMG regarding the theft of timber from forests in the forest divisions of Jhapa, Biratnagar, and Kabhre-Palanchok (Nepal Gazzette, September 9, 1975). During the Fourth Plan period, the forestry administration began recruiting retired army and police personnel to replace the forest guards by the armed forest guards. By 1975 the MF grew into a large organization with the two resettlement agencies transferred from the Ministry of Food and Agriculture. Thus it consisted of 4 departments viz. forest, soil and water conservation, medicinal plants, and resettlement, and 4 corporations independently dealing with timber, drug, fuelwood, and resettlement. The expansion of the CCF Office was not systematic (DF, 1978:8-10, 77).

The events described above revealed that the forestry (conservation) organization grew in size, but its effectiveness never materialized. Because on the one hand new departments and territory offices were created and on the other hand various inquiry commissions were also created to investigate and regulate forestry related programs. The transfer of the training component did not hamper the

effectiveness of the forestry organizations, on the contrary it did a commendable reform by linking the executive organization with the educational institutions.

Technical Areas for Emphasis

The data in Table 31 give a picture of technical areas for emphasis during the Fourth Plan period (1970-75).

Table 31. Target and Progress of Forestry Sector (1970-75)

#	Items	Units	Target	Progress	% Progress
1.	Reforestation	ha	8000	7300	91.25
2.	Forest Management				
	(i) Demarcation	km	4000	...	..
	(ii) Buildings	number	as required		
	(iii) Forest Development				
	(iv) Working Plans	division	6	...	..
3.	Watershed Management	location	2	...	..
4.	Wildlife Management	park			
5.	Extension Service				
6.	Survey				
7.	Research				
8.	Training				
	(i) Rangers	person	125	...	..
	(ii) Foresters	person	350	...	..

(Source: NPC, 1972:111-115, and FAO, 1981:344)

The Fourth Plan actually had nine different forestry projects. Their technical activities overlaped each other in some cases. For example, afforestation (reforestation) program was included in two projects viz. Afforestation and Jiri Multipurpose. Survey, research and other activities were included in other projects. A list of projects and their major activities is given in Table 32. The projects (# 5 and 6) were new in the Plan and the rest were all continuation of the Third Plan projects.

Table 32. Forestry Projects and Their Major Activities (1970-75)

#	Project	Activities
1.	Forest Inventory Management Country wide (Preparation of the working plans)	Aerial survey, working plans for 6 divisions, revisions of working plans for 3 divisions, forest industry survey, soil and land-use survey of 8 divisions, soil conservation in Kathmandu watershed, Silvicultural research etc., climatological data sampling, timber grading, building construction etc.
2.	Implementation of Working Plans	(Activities could not be made available)
3.	Afforestation	4000 ha in the hills, 4000 ha in Terai, and maintenance of old plantation
4.	Forest Training	Every year 25 rangers and 70 foresters, orientation training for the new officers
5.	Royal Nagarjung Forest (proposed)	Working plan and management (29 km fencing, 20 forest guard posts, 8 ha reforestation)
6.	Forest Demarcation (proposed)	4000 km demarcation, maintenance of 4000 km old demarcation
7.	Building Construction	Maintenance and new construction
8.	Forest Development	Proposal for forest based industries
9.	Jiri Multipurpose	Silvicultural operation, nursery, afforestation, and forestry extension

(Source: NPC, 1972:113-115)

People's Paticipation

Among the Fourth Plan policies, the fifth policy of social justice concluded its principle by stating that

> "...attempts will be made more effectively to make involve panchayats of various levels in the process of both plan formulation and implementation in order to make participation of the people in the local development work more active and dynamic." (NPC, 1972:7).

In the panchayat sector of the Plan, an emphasis was given to promote initiation at the zonal, district and at the village level programs. These statements showed that people's participation was sought at the project formulation and implementation through panchayat organizations. Such projects, however, did not include conservation as an important item. Also there was no one forestry program proposed to launch in cooperation with the local people. The discussion can be

further elaborated by viewing the forestry situation as it was developing.

- Increasing illegal encroachment damaged forests
- privileges such as Harghar Sangha (a tradition under which the government issues permits to the public for cutting certain trees for domestic purpose) had an adverse effect on the forests
- forestry services did not fully cover the hill forests
- forest management works e.g. forest paths, fireline, etc. were not properly utilized
- lack of coordination between the departments of land, survey, revenue, forest and resettlement.

(Source: NPC, 1972:11)

A general remark by Rana, P.S.J.B. (1971:43) supported several commendable achievements in various local developments (e.g. roads, schools etc.) through voluntary labor contributions. But, he noted, the weak design and the lack of supervision on those efforts resulted in frustation, wastage and anger. Pradhan, P. (1973:59) observed that the Fourth Plan did not visualize the substantial contribution by the panchayat sector for the contribution of people's participation. Similarly, Uphoff and Ilchman (1973:31) suggested for every development project and social investment that one must ask five questions such as

> "Who has chosen this project? Who will implement it? Who consumes its products ? Who does not participate in its benefits? and Who pays directly or indirectly for it ?"

The observations found that people's participation was not properly harnessed for the development works in general.

Legislation

The Fourth Plan realized that

> "...there should be strict judicial arrangements and good administrative management supporting the forest demarcation once it is fixed." (NPC, 1972:111).

The First Amendment of the Forest Protection (Special Arrangement) in

1970 revised mainly the sections related to the penalties and punishments procedures.

The 1971 "Jhora" Lands Act terminated the rights of a landowner to land circumscribed by the forests (i.e. "Jhora") and not cultivated for two years (Regmi, 1976:215). Such land acquired by the Act was to be allotted to cultivators, and not converted into the forests.

The 1972 Precise Workprocess Act amended the 1961 Forest Act by removing few undesirable words (LBMC, 1983:146-171). In 1972 HMG enacted the Plant Quarantine Act. The National Parks and Wildlife Conservation Act of 1973 was enacted repealing the 1958 Wildlife (Protection) Act. In 1974 the First Amendment of the Act specified the deadline of getting a certificate for the animal trophies already in possession (LBMC, 1983:185-197). Several Rules were also formulated after the enactment of the Act, e.g. the 1974 National Parks and Wildlife Conservation Rules, the 1974 Royal Chitwan National Park Rules and the 1975 Royal Nagarjung Forest (Entry and Sale of Forest Products) Rules (Chakroff, 1979:24-27). The legislation pertaining to wildlife conservation created the national parks, the wildlife reserves and the necesary rules to govern them, and also protected the endangered animals and birds. The legislation became the landmarks in conservation of the natural resources.

Chakroff (1979:14, 29-30, 33) also listed three more Rules pertaining to conservation, such as the 1972 Gift Parcel Rules (dealing with animal trophies etc.), the 1974 Canal Management Rules (for the protection of canal banks from biotic effects), and the 1975 Land (Survey and Measurement) Rules (for proceeding in case of complaint, and grading of urban lands etc.).

Conservation Strategy 1975-1980

Objective

The objectives of the Fifth Plan (1975-80) were derived from the Constitution, as were done in the previous plans. However, the Fifth Plan envisaged more a specific objective as follows:

> To maximize output consistent with the minimum felt needs and paripassu increase in purchasing power of the common people by involving them in actual process of production.

Thus the Plan introduced the "twin objectives" of "production" and "participation". The other general but notable objective envisaged by the Fifth Plan was the concept of regional development based on the natural resources and labor force scattered all over the country. The policy behind the objective of balanced development was the consideration of the natural environment of the country, such as to develop livestock in the northern highland, horticulture in the central midlands, and the foodgrains and cash-crops in the southern lowlands (NPC, 1975:7-8).

In its introductory chapter, the Fifth Plan stated that

> "agriculture is linked with the natural resources and climatic conditions ..." and "an agricultural strategy based on ecological specialization could contribute both to production increase and the regional balance." (NPC, 1975:3).

Thus the objective of the Fifth Plan reflected the importance of conservation for sustained development of the country. But the Plan did not have any specific objective pertaining to conservation.

Priority

The priority areas singled out in the Fifth Plan were population control, employment generation, scientific land-use and fuller exploitation of water resources (NPC, 1975:3). Based on the financial resource allocation of the Plan, the order of priority was as follows:

I Agriculture, Irrigation, Land reforms, Forests etc.

II Transport and Communications

III Industry, Commerce and Power, and

IV Social Services (Health, Education, Drinking water etc.)

(Source: NPC, 1975:9-10, 24-25)

The forestry component was also among the priority items of the Fifth Plan. Among the items of the agricultural sector main emphasis was given to the direct agriculture development (i.e. agricultural inputs) and resettlement (i.e. expanding the cultivable land). The other major programs were irrigation, and land reform & survey. The forestry component (including soil conservation, wildlife management etc.) was the last prioritized item which received a little less than one-tenth of the government allocation for the entire agricultural sector. However, in the Fifth Plan, the conservation programs received more theoretical support than in the previous plan.

Budget

The total plan budget and its allocation for the forestry sector are given in Table 33.

Table 33. Budget of the Fifth Plan (1975-80)

Items	Average Allocation Rs. million (1975-80)	%	Actual Expenditure Rs. million (1975-79)	%
Forestry	196.2	1.91	141.45	1.42
Plan total	10298.5	100.00	9939.20	100.00

(Source: NPC, 1975:26; CBS, 1982:156-157; Manandhar,1982:3)

About one third of the forestry subsector budget was set aside for conservation of soil and water resources (NPC, 1975:15). The public sector allocation of the Plan was average Rs. 6857.5 million. Conservation was a public sector activity and hence its share of the

government (i.e. public) sector was 2.88%. The panchayat and the private sectors respectively covered 10.2% and 23.2% of the total plan budget. These sectors did not have direct expenditures in conservation. The indirect expenditures would cover some private efforts in conservation and "by-products" type activities while performing other development works such as irrigation canals, water mills, agriculture etc.

Organization

The changes within the forestry organization in 1976 were as follows:

1. Formation of Board for Resettlement in Forest Areas of Jhapa and Biratnagar, 1976 (Nepal Gazzette, March 24, 1976)
2. The CCF Office was renamed as the DF as decided on April 1, 1976 (Nepal Gazzette, April 26, 1976)
3. The Nepal Forest Service was administratically reorganized to suit the general administrative pattern of HMG (Nepal Gazzette, July 14, 1976)
4. Formation of the Forest Products Development Board, 1976 (Nepal Gazzette, October 25, 1976)
5. Formation of the Shivpuri Watershed Area Development Board, 1976 (Nepal Gazzette, October 25, 1976)

According to the 1976 National Forestry Plan (DF, 1978:77-93), there were 9 circles, 40 divisions and 174 ranges under the DF. Along with these territorial offices to cover the whole country, the DF also had functional offices viz. Forest Resources Survey and Research, National Parks and Wildlife Reserves, and Afforestation (previously called as the Bagmati Zone Afforestation Scheme). These functional offices had their own autonomous organization that linked with the DF.

The original 1974 organization of the DSWC remained unchanged. But it expanded in terms of projects in four development regions as per the objective of regional development envisaged in the Fifth Plan. The period of operation and the location of the projects are given in

Table 34. The projects were directly responsible to the Director General of the DSCWM. It did not have permanent territorial offices. The projects were operational during the Plan period and they might or might not be continued in the following plan. The Remote Sensing Center was established under the DSWC in 1979.

Table 34. Soil and Water Conservation Projects (1975-80)

#	Project Name	Fifth Plan 1975 1976 1977 1978 1979 1980	Location
1.	Bagmati	————————————	Kathmandu
2.	Biring	————————————	Ilam and Jhapa
3.	Daksinkali	———	Kathmandu
4.	IWM	————————————	country wide
5.	Khorke etc.	————————————	Surkhet
6.	Lamidanda	———	Kabhre
7.	Lothar	————————————	Chitwan
8.	Phewatal	————————————	Kaski
9.	Publicity etc.	———	country wide
10.	Rasuwa etc.	————————————	Rasuwa and Nuwakot
11.	RCUP	———	Gorkha, Makawanpur, Mustang, and Myagdi
12.	River Control	————————————	Terai
13.	Sagarmatha	———	Udaypur
14.	Tinau	————————————	Palpa

Note:

4. IWM = Integrated Watershed Management, Torrent Control and Land-use Development Project
5. Khorke etc. = Khorke, Itram and Jhupra Watershed Project
9. Publicity etc. = Publicity, Extension and Research Project
10. Rasuwa etc. = Rasuwa Nuwakot Integrated Rural Development Soil Conservation Project (also called the Divisional Soil Conservation Office)
11. RCUP = Resource Conservation and Utilization Project

(Source: DSCWM, 1982:71-80)

Technical Areas for Emphasis

The conservation activities performed during the Fifth Plan are shown in Table 35. Reforestation was the major technical effort in conservation but could hardly succeed to meet 50% of the target. The mortality percent of the reforestation has yet to be considered.

Details of forest management activities could not be made available. The reciprocal increase in cultivated area from 23,260 sq km in 1975 to 31,268 sq km in 1980 coincided with the loss of forest areas from 48,230 sq km in 1975 to 40,997 sq km in 1980 (KC, 1982:10). The watershed management activities established conservation plots in various project areas which proved to be promising demonstration plots in order to convince the local people. Two national parks and two wildlife reserves were gazzetted in 1976. Education and extension activities were initiated in soil conservation and wildlife conservation. The reconnaissance inventory (survey) of the major ecological land units and their watershed conditions was completed in 1980. The remote sensing activities were started in 1980 (DSCWM, 1982:42-43, 48-49).

Table 35. Target and Progress of Conservation Activities (1975-80)

# Items	Unit	Target	Progress	% Progress
1. Reforestation	ha	20000	9864	49.32
2. Forest Management				
(i) Demarcation	km	8080	...	..
3. Watershed Management				
(i) Plantation (including fruits and grasses)	ha	1517	1181	77.85
(ii) Checkdams	number	1135	1199	105.64
(iii) Terracing	ha	378	166	43.92
(iv) Embankment	meter	5476	12292	224.47
4. Wildlife Management				
5. Extension				
6. Survey				
7. Research				
8. Training				
(i) Rangers	person	178	...	..
(ii) Foresters	person	644	...	..
(iii) Graduates	person	15	...	..

(Sources: NPC, 1975:28; DSCWM, 1982:71-80; ADB, 1982:12; and IDS, 1983:45, 63-65)

The research activities could not swiftly advance. Some research

on silviculture, agro-forestry, soil conservation were initiated but the efforts seemed to be the weakest in forestry development (IDS, 1983:63-64). The training institute come under TU. The Fifth Plan document mentioned a supply of 204 forest graduates (NPC, 1975:48) whereas the National Council for Science and Technology (1977) listed only 155 forest graduates. The supply of rangers was 380 and of foresters was 1133 in the Fifth Plan (NPC, 1975:48). The actual progress in training could not be made available.

People's Participation

The Fifth Plan document mentioned in its concluding remarks that

> "it (development) is a continuous process, no doubt. But the development process must inspire the popular confidence and sustain it all the time, since the cooperation or forebearance of the people are more significant than other physical inputs and resources." (NPC, 1975:22).

It also mentioned to financially and technically support the local people's efforts to repair, renovate and extend the very small but remarkably useful and operational irrigation channels ("kulos") (NPC, 1975:13). The Local Development Department had a target to construct more than 400 km of hill trails in cooperation with the local people (NPC, 1975:16). But the Plan failed to specify the vitally important component of soil conservation and reforestation through people's participation.

The 1976 National Forestry Plan outlined 22 programs and procedures for forest development. The 21st item was the people's cooperation and participation program. The section described the direct benefits from forests would be made available to the general public (particularly in backward areas). A public cooperation and participation program would be carried out to involve the public in

the use and management of local forests (DF, 1978:68-70). Thus the fundamental principle of managing forest only through the government agencies began to change.

Lohani (1980:93) remarked that no sustained effort on the part of the masses to tackle the problem of soil erosion and landslides had become possible because of the existence of constraints in people's participation. More strikingly he remarked that people's participation in Nepal remained a concept that was much discussed rather than practized and that it was limited primarily to semi-voluntary form of rural road construction during a few days in the off season with much political zeal and propaganda (Lohani, 1980:97).

A government sponsored seminar recommended that mobilization of rural labor at the local level should be increased. It also emphasized that the participation of the poor in decision making at the community level on matters that affect their own well-being should be promoted and encouraged (ILO-ARTEP, 1980:271).

Fearnside et al (1979) proposed a nationwide conservation education program for the whole cross-section of the people i.e. farmers, policy makers etc. Another observation based on the research by Pradhan, P. (1980:83-84) was that the root cause of failure of the government initiated rural development program was bureaucratic and top-down approaches to reach the rural population. In contrast, he gave examples of successful programs (the suspension bridges in Baglung and the hill road in Ilam) in which the local people had their voice in decision making and implementation. He also mentioned the National Development Service of TU which significantly contributed in mobilizing the local people to build school buildings, drinking water

schemes, pit latrines and so on. One of the five objectives of the Service was to help the villagers in the task of preserving forests. Conservation was given more attention as the Service program progressed. However, the Service was suspended following the political events in May 1979 (Pradhan,P., 1980:63 and 66).

As a part of involving the entire cross-section of the people in reforestation, the Afforestation Office freely distributed tree saplings. Every year the MF used to observe the "Forest Festival" and the DSWC used to observe the "Conservation Week." Participation of the local people and of the non-governmental organizations e.g. Nepal Scouts, Nepal Red Cross Society, the Youth Activities Coordination Committee, and other local clubs was an indication of people's awareness of conservation. An evaluation of such efforts has yet to be made systematically, and yet to be organized for the effectiveness.

Legislation

The Nepal Forest Service (Classification, Gradation, Appointment, and Promotion) Rules of 1976 were published on the Nepal Gazzette (July 14, 1976). The Shivpuri Watershed Area Development Board (Formation) Order of 1976 was formulated in order to develop Shivpuri watershed (Nepal Gazzette, October 25, 1976). The Forest Products Development Board (Formation) Order of 1976 established such Board for the management of forest products projects, sale/supply depots, supply of raw materials to the forest based industries, and research on demand of timber and firewood (Chakroff, 1979:21).

The Forest Protection (Special Arrangement) (Second Amendment) of 1977 added, revised and removed several sections and subsections in order to make them clearer and more specific than before. The Third

Amendment of the Act in 1978 revised the case procedure (Section 10) (LBMC, 1983:172-180).

The Forest (First Amendment) Act of 1977 revised the sections pertaining to the community forests and it legally approved local people to manage, develop and conserve the forests. The Forest (Second Amendment) Act of 1978 further revised the sections mainly dealing with the private forests (LBMC, 1983:146-171).

By exercising the power conferred by the Forest (Second Amendment) Act of 1978, HMG also formulated three Rules as folows:

1. The Lease Forest Rules, 1978: HMG might lease barren areas for forestry development. (NAFP, 1978:129-141)
2. The Panchayat Protected Forest Rules, 1978: a local village or town panchayat could protect the government forest for the benefits of the local people.
3. The Panchayat Forest Rules, 1978: a local panchayat could manage forest in order to benefit the local people. (LBMC, 1980)

The 1978 Panchayat Forest Rules repealed the 1968 Panchayat Forest Rules. The First Amendments (1980) of both the PF/PPF Rules specified the areas and boundaries of the PF and the PPF. It also made provision of free distribution of tree saplings by HMG (LBMC, 1980: 1-14). Thus HMG promulgated the radically new Rules which returned the ownership of the forests to the people.

The 1976 Mountaineering Expedition Regulation also provided the camping rules which emphasized environmental considerations. The 1976 Narcotic Drug (Control) Act was also related with the environment as well (Chakroff, 1979).

The amendment of the Tribhuvan University Act in 1979 made the National Development Service optional for students (Pradhan, P., 1980:63). The consequences of this amendment are yet to be experienced, because the Service has not yet resumed.

Conservation Strategy 1980-1985

Objective

The four major objectives of the Sixth Plan (1980-85) were as follows:

1. Gradual elimination of absolute poverty through employment opportunities
2. Fulfillment of minimum basic needs
3. Social restructuring
4. Conservation and development of natural resources

(Source: NPC, 1979:17-19)

Thus for the first time in the development history of Nepal, the national development plan incorporated "conservation and development of natural resources" as one of the main national goals. The Sixth Plan realized that "the perpetual progress and prosperity of Nepal and the Nepalese depend upon conservation..." and that "...Plan aims at maintaining proper balance between nature, population and ecology..." (NPC, 1979:19).

The agriculture sector consisted of 25 sectoral policies and among them the last seven dealt with forest management, resettlement, watershed management and wildlife management etc. The tourism subsector mentioned "to preserve and protect natural ... endowment of the country..." But the other sectors did not mention the role or importance of conservation in their sectoral development e.g. in agronomy, horticulture, pasture, fishery, industry, power, irrigation, transportation, and social service (NPC, 1979:35-53). Thus, conservation was conceived as the subsectoral responsibility of forestry and soil conservation rather than as the integral part of development as a whole.

The relatively new concept of IRD did not envisage the vital component of conservation. But in practice, soil conservation became

one of the major components of the IRD and the DSCWM as the responsible agency to carry out the technical activities (DSCWM, 1982:52-59). The Five Year Plan of the panchayat sector also included a program to control soil erosion (NPC, 1979:57-72).

Priority

In the Sixth Plan, the first priority was given to the agricultural sector, which was consistent with the objectives of the Plan. Within the agriculturae sector, conservation was given a greater emphasis than was done in the Fifth Plan. The emphasized conservation projects were mostly afforestation, and watershed management.

The other sectors, social services, industry, and transport followed the agricultural sector in priority. In the panchayat sector of the Plan, the top priority was given to agriculture and followed by transport, social service and industry. The non-governmental sector prioritized agriculture, industry, and transport. Conservation was a government sponsored program (NPC, 1979:30-33) and in general, it was placed in a high priority sector of the Plan.

Budget

The total budget of the Sixth Plan was estimated to be Rs. 28,000 millions. The approximate total expenditure of conservation sector was estimated to be Rs. 764.0 million. The expenditure was to cover forest development, soil and watershed conservation, medicinal plants and drug development, and others. It was approximately 2.7% of the total plan budget (NPC, 1981:Table 21.4).

According to the fourth function of the National Resource Conservation Commission, development projects dealing with the natural resources had to allocate a certain portion of their total budget for

the sake of conservation (DCSWM, 1982:29). This decision, when implemented, would have a strategic as well as positive impact on the conservation efforts of Nepal.

Organization

In 1980 the DSWC was renamed as the DSCWM and its River Control Project was transferred back to its original Ministry of Water Resources. Thus by the start of the Sixth Plan, the DSCWM began to concentrate on soil conservation and watershed management. Similarly, the name of the MF was renamed as the MFSC (DSCWM, 1982:15).

By the beginning of the Sixth Plan, two departments and one corporation were established under the MFSC as follows:

1. Department of National Parks and Wildlife Conservation,
2. Department of Drug Administrations, and
3. Herbal Production and Processing Company Limited.

But in 1982 HMG announced the merger of the three corporations into one. The merged corporations were the TCN, the Fuelwood Corporation, and the Forest Product Development Board (Manandhar, 1982:4). In 1984 there were 6 departments and 6 corporations (counting the three merging corporations separately) under the MFSC umbrella:

Departments:
1. Forests,
2. Medicinal Plants,
3. Soil Conservation and Watershed Management,
4. Resettlement,
5. Drug Administrations, and
6. National Parks and Wildlife Managment.

Corporations:
1. Timber Corporation of Nepal,
2. Fuelwood Corporation,
3. Forest Products Development Board,
4. Royal Drug Limited,
5. Nepal Resettlement Company, and
6. Herbal Production and Processing Company Limited

The MFSC also had the Training Wing which was responsible for the inservice training of the staff. Each department had its own set of orgnization, such as the DSCWM had 11 projects (Table 36) and the DF

had 15 projects (Table 36).

Table 36. Major Conservation Projects of the Sixth Plan (1980-85)

#	Project Name	Cost Rs.	Period	Major Activities	Responsible Department(s)
1.	Afforestation	17.50	1980-85	reforestation	DF
2.	Bagmati Watershed	—	1974-85	reforestation gully control	DSCWM
3.	Community Forestry Development	29.74	1980-85	reforestation forest management sapling & stove distribution	DF
4.	Environmental Impact Study	—	1981-85	drafting environmental laws and policies	DSCWM
5.	Forest Survey and Research	2.44	1982-83	survey and research	DF
6.	Karnali Bheri IRD	3.46	1981-85	reforestation soil conservation	DF, DSCWM
7.	Koshi Hills Area Development	7.50	1979-84	reforestation	DF
8.	Mahakali IRD	—	1980-	reforestation soil conservation	DF, DSCWM
9.	Nepal Australia Forestry	14.00	1978-83	reforestation	DF
10.	Nepal Remote Sensing Center	—	1979-	analysis of imageries, training	DSCWM
11.	Rapti IRD	36.00	1980-86	reforestation soil conservation	DF, DSCWM
12.	Rasuwa Nuwakot IRD	7.21	1976-82	reforestation soil conservation	DF, DSCWM
13.	Ratuwamai Afforestation	10.92	1979-85	reforestation	DF
14.	Resin and Turpentine	36.13	1981-85	resin tapping	DF
15.	Resource Conservation and Utilization	30.20	1980-85	reforestation soil conservation	DF, DSCWM
16.	Sagarmatha IRD	1.05	1979-85	reforestation soil conservation	DF, DSCWM
17.	Sagarnath Forest Development	13.21	1978-91	reforestation	DF
18.	Tinau Watershed	—	1977-	reforestation soil conservation	DSCWM, DF
19.	Watershed Management and Conservation Education	73.76	1981-84	reforestation soil conservation extension	DSCWM
20.	(details of wildlife management projects under the Department of National Parks and Wildlife Conservation could not be made available)				

(Note: IRD = Integrated Rural Development)
(Sources: ADB, 1982:Appendix 2.33, DSCWM, 1982:83-96)

The IRD projects have both the components of soil conservation and forestry. The integrated watershed management projects (led by the DSCWM) also had a forestry component. There were 7 national parks and 2 wildlife reserves under the jurisdiction of the Department of National Parks and Wildlife Conservation.

HMG announced in July 1983 that the old division units would be abolished under a phased program and each district would be made a territorial office unit (comparable to division) (Monitoring and Evaluation Unit, CFDP, 1983:1). (In 1984 there were 75 districts in Nepal).

A strong coordinating unit in the MFSC was proposed in order to control and coordinate all the conservation related institutions (NPC, 1979:41). Such a unit was established under the provision of Section 15 of the 1982 Soil and Watershed Conservation Act, by the name of the National Resource Conservation Commission. The Section 16 of the Act provided for the organization of the District Soil and Watershed Committees (LBMC, 1983:206). One of the functions of the District Committees was to form village and ward level conservation committees (DSCWM, 1982:35). (There were nine wards in each village panchayat.) The above district and village level conservation committees come under the jurisdiction of the DSCWM. Such committees were formed in selected project areas of the DSCWM, and are yet to be formed in all the 75 districts, 4022 village panchayats, 29 town panchayats and their (of village and town panchayats) respective wards.

Technical Areas for Emphasis

The Sixth Plan document covered such aspects of conservation as the protection, maintenance and development of forests, soil

conservation, forest based industries, resettlement, herbal development, wildlife conservation, and extension. (NPC, 1979:40-42). The target for reforestation during the Sixth Plan is given in Table 37.

Table 37. Reforestation Target of the Sixth Plan (1980-85) in Hectares

Department of Forests				DSCWM	Total
National Forests	PPF	PF	Farm Forests	Conservation Plantation	
12,258	41,113	14,856	3,200	1,600	72,027

Note: PPF = Panchayat Protected Forest, PF = Panchayat Forest
(Source: ADB, 1982:261 and DSCWM, 1982:83-96)

The overall target of all technical areas during the Plan is given in Table 38.

Table 38. Target of Conservation Activities (1980-85)

#	Item	Unit	Target
1.	Reforestation	ha	72,027
2.	Forest Management		
	(i) Protection and Improvement	ha	82,189
	(ii) Improved Stove Distribution	number	15,000
3.	Watershed Management		
	(i) Gully Control	number	154
	(ii) Terracing	ha	258
4.	Wildlife Management		
5.	Extension		
6.	Survey		
7.	Research		
8.	Training		
	(i) Certificate (rangers)	person	1,310
	(ii) Diploma (graduates)	person	384
	(iii) In-service	person	2,140

(Source: ADB, 1982:261, DSCWM, 1982:83-96, and Manandhar, 1982:13-15)

The item 4 of Table 38 (Wildlife Management) includes development, improvement and extension of national parks. The extension programs (item 5) would support the reforestation and soil

conservation programs. Similarly, survey of wildlife, watershed, and forest would continue, and research on wildlife, soil conservation, herbal development, forestry and other areas would also continue (NPC, 1979:40-42).

The certificate level training includes both the middle-level and lower-level technicians of forestry, soil conservation and wildlife management. In both the levels, i.e. certificate and diploma, the courses on forestry, soil conservation and wildlife management were taught. The in-service training covers all the staff working under the MFSC umbrella (Manandhar, 1982:15). Thus, within the Sixth Plan period, the Institute of Forestry under TU was expanded up to the diploma level courses and the Training Wing under the MFSC was established for the in-service training. Previously, the graduates in forestry were trained abroad.

Some of the CFDP achievements are given in Table 39.

Table 39. Some of the Achievements of the CFDP (1980-83)

Item (Unit)	Project Target upto 1985	Target upto 1983	Achieved upto 1983	Percent Achieved upto 1983	Percent of Project Target Achieved
Nursery Operated (#)	408	367	350	95	88
Total Plantation (ha)	15,660	5,470	4,044	74	26
Sapling Distribution (million)	0.9	0.36	10.75	299	119
Demarcation (km)	4,500	2,825	1,455	52	32
Stove Distribution (#)	14,000	2,775	2,630	95	18

(Source: Monitoring and Evaluation Unit, CFDP, 1983:44)

People's Participation

The people's participation was the key strategy of conservation in the Sixth Plan. Its implementation strategy, in general, was to widen the panchayat sector through people's participation and also to

further strengthen the public opinion and participation in the district level projects (NPC, 1979:26). Mobilizing people's participation was the major policy of forestry and soil conservation programs (NPC, 1979:40-41).

Under the radically new principle of forestry by the people, HMG was committed to share approximately 45% of the total national forests with the local people. Such forests called the PF/PPF were to cover approximately 1.84 million ha in due course of time (Manandhar, 1982: 9). Similarly, the watershed management and soil conservation projects were to be implemented in collaboration with the district and village level conservation committees (DSCWM, 1982:34-35).

In this way, the local people could participate to decide, to control and to manage the conservation projects, through their representatives. Moreover, the general public meeting of a village panchayat was another platform where the local people could freely participate. (The film "Fragile Mountain" has pictured such meetings). Another expectation of the participation was that the local people could equally share the benefits of the projects.

The ICIMOD working paper stated that the people and the leaders were unaware of the ecological problems in the country (IDS, 1983: 8-9). Such kinds of observations were not rare. However, Campbell and Bhattarai (1983:vi) found from their evaluation surveys 1982-83 that interest in forestry and plantation was universally high and awareness of community forestry activities had increased substantially in panchayats exposed to the program for over a year. Such observation was equally true in the watershed project areas. The technical know-how of conservation is not the panacea of ecological disaster.

The participation of the local people (including the entire cross-section of a community) is vital to the success of a conservation program (DSCWM, 1982:15-16).

Legislation

One of the policies envisaged in the Sixth Plan was the proposal to build up some legal provisions in order to control and coordinate all the relevant institutions or units using land and also to keep them from contaminating the atmosphere (NPC, 1979:41).

The 1982 His Majesty King Mahendra Nature Conservation Fund Act was enacted to provide funds for the conservation and research on wildlife. Under the guardianship of His Majesty the King, the fund was to be handled by a 15 member committee (LBMC, 1983:198-201).

The 1982 Soil and Watershed Conservation Act provided authority to the Catchment Conservation Officer to carry out technical measures in a protected watershed. The Act also established the National Resource Conservation Commission, and the District Soil and Watershed Committees. The Act also provided for land classification and environmental assessment of the industrial, commercial, or resettlement colonies (LBMC, 1983:202-208).

The 1982 National Park and Wildlife Conservation (Second Amendment) Act provided facilities to the local people to enjoy the forest products according to the Section 16A. The amendment also revised the pertinent Rules and policies (LBMC, 1983:185-197).

According to the Finance Minister's budget speech made on July 8, 1984, the interested families could grow forests for 50 years as leased by HMG. The 1984 Private Forest Rules were formulated under the 1961 Forest Act. The Rules provided the forest growers with free

saplings, technical advice and the financial facilities (Nepal Press Digest, July 16, 1984).

The 1982 Decentralization Act was enacted with the objective of ensuring people's participation, equitable and balanced distribution of development benefits, institutional development of the panchayats, and more effective planning and implementation of development programs at the local level on the basis of local potentials and problems (IDS, 1983:53-54). The Act also formulated functions/duties of the local panchayats that included conservation as one of the 11 major activities. It also organized five local level planning committees and among them was the Industry, Forest and Soil Conservation Committee (IDS, 1983:53-54).

Comparison of Conservation Strategies (1951 to 1985)

This section of Chapter III presents the comparison of conservation strategies advocated by HMG in various plan periods. In fact, this section is a consolidation of the preceding sections. The format mentioned in Table 1 is practized in this section also. On the basis of the analysis and description as presented in the previous sections each of the seven aspects of conservation strategy is chronologically compared in the following manner.

Comparison of Objectives

The period 1951-56 passed without any development plan as such. The main objective of the proposed government program of 1952 could not be made available. The First Plan (1956-61) objective was to raise production, employment, standard of living and general well being throughout the country.

The primary objective of the Second Plan (1962-65) was to develop the basic infrastructures, and the four longterm objectives were the expansion of agricultural and industrial production, economic stability, employment opportunities, and social justice. The objectives of the Third Plan (1965-70) were close to those of the preceding plan. They also considered agriculture production, institutional reform, economic infrastructures, industrial development, foreign trade, and social justice.

The objectives of the Fourth Plan (1970-75) were not different from those of the previous plans. The key terms of the objectives were synonymous to those used in the previous plans. The six objectives were stated in terms of maximization of output, establishment of economic base, expansion and diversification of international trade, economic stability, and creating conditions for the exploitation free society.

In the Fifth Plan (1975-80), the objectives were stated differently than in the previous plans. Its "twin objectives" were to maximize output and paripassu increase in purchasing of the people. Basically, the objectives were concerned with the improvement of the living standard of the people.

The Sixth Plan (1980-85) became more precise and realistic in terms of objective statements which dealt with the elimination of poverty through employment, fulfillment of the basic needs, social restructure, and conservation of natural resources.

The key words of the objectives of various plans are given in Table 40 for comparison.

Table 40. Key Words of the Plan Objectives

Plan (period)	Key Words
First Five Year (1956-61)	Raise production, Employment, Standard of living, General well being, and Simultaneous advance on all fronts etc.
Second Three Year (1962-65)	Economic and social infrastructures, Expansion of national production, Economic stability, Employment opportunities, and Social justice
Third Five Year (1965-70)	Agriculture production, Institutional reforms, Economic infrastructures, Industrial development, Foreign trade, and Social justice etc.
Fourth Five Year (1970-75)	Maximizing output, Economic base (viz. transport, communication, power etc.), International trade, Economic stability (price control), Use of manpower, Population control, and Society free of exploitation etc.
Fifth Five Year (1975-80)	Maximization of output, Basic needs of the people, People's purchasing power, Involvement of the people, Regional development, and Ecological concept of development etc.
Sixth Five Year (1980-85)	Elimination of poverty, Employment opportunities, Fulfillment of basic needs, Social restructuring, and conservarion and development of natural resources etc.

(Source: various plan documents)

Comparison of Priorities

The proposed program of 1952 prioritized the infrastructures and sevices e.g. roads, airports, postal service, radio, education, and industry. Forestry was in the sixth position among the ten priority areas for development as suggested by Rose.

In the First Plan, forestry programs were discussed in the agricultural sector. Thus it received the second priority in the Plan. The Second Plan gave the fourth priority to the sector consisting of agriculture, irrigation and forestry. The Third Plan described agriculture as the highest priority sector but according to the allocation of the public sector expenditure, it received only second priority. In the Fourth Plan, the agricultural sector received the

second priority. The Fifth Plan and the Sixth Plan gave the highest priority to the agricultural sector.

The information given in Table 41 shows the order of priority given to the agriculture sector (including forestry and conservation) in the various plans.

Table 41. Priority Given to the Agricultural Sector in the Various Plans

Plan	Period	Sectoral Spread	Priority
First	1956-61	Agriculture, Irrigation, Forestry	second
Second	1962-65	Agriculture, Irrigation, Forestry	fourth
Third	1965-70	Agriculture and Village Development (including Forestry)	second
Fourth	1970-75	Agriculture, Land reform, Irrigation, Forestry & Botany	second
Fifth	1975-80	Agriculture, Resettlement, Irrigation, Land reform, Forestry	first
Sixth	1980-85	Agriculture, Irrigation, Soil conservation, Land reform	first

(Source: various plan documents)

According to Stiller and Yadav (1979:265), the agriculture sector was given high priority in all plans but one, and agriculture was only one unit in the sector. Thus they gave as a reason why the development of agriculture did not match the high priority that planners assigned it was the simple fact that agriculture never ranked as high as planners said it did. Similar thought can be provoked in the case of forestry (or conservation) as well.

Comparison of Budgets

The budget allocation for conservation in the proposed program of 1952 could not be made available. The First Plan (1956-61) allocated Rs. 20.0 million for forestry and Rs. 12.0 million for agriculture, which were respectively 6.1% and 3.6% of the total plan budget. However, the actual expenditure in forestry and agriculture combined

was Rs. 6.9 million (i.e. 3.2% of the actual total expenditure). The actual expenditure of the Plan was only 65.0% of the estimate.

The allocation of budget for forestry & botany in the Second Plan (1962-65) was Rs. 13.4 million (2.2% of the total allocation) and the actual expenditure was Rs. 14.6 million (2.5% of the actual total expenditure). The total actual expenditure was 99.5% of the estimate.

The Third Plan (1965-70) allocated Rs. 45.0 million for forestry and Rs. 7.5 million for botany, which were respectively 2.6% and 0.4% of the total estimate. The actual total expenditure was 102.2% of the estimate, but the figures for forestry and botany could not be made available.

In the Fourth Plan (1970-75) the allocation for forestry and medicinal plants (previously called botany) were respectively Rs. 61.1 million and Rs. 19.7 million (i.e. respectively 1.7% and 0.6% of the total investment). The actual expenditures could not be made available.

The average allocation for forestry in the Fifth Plan (1975-80) was Rs. 196.2 million (1.9% of the total average allocation) and the actual expenditure was Rs. 141.5 million (for 1975-79) which was 1.4% of the total expenditure for 1975-79. The total expenditure for 1975-79 was 96.7% of the estimate for the plan period of 1975-80.

The Sixth Plan allocated about Rs. 764.0 million for the sector of conservation (forestry). The sector consisted of forest development, soil and watershed conservation, medicinal plants and drug development, and others. The allocation was approximately 2.7% of the total plan estimate.

The allocation and actual expenditures for forestry (including

botany, soil conservation and wildlife management etc.) in various plans are compared in Table 42.

Table 42. Forestry Budget in Six Plans

Plan	Period	Allocation of Budget			Actual Expenditures		
		Rs. million		%	Rs. million		%
		Total Plan	Forestry		Total Plan	Forestry	
First	1956-61	330.0	20.0(a)	3.6	214.5	6.9(b)	3.2
Second	1962-65	600.0	13.4	2.2	596.8	14.6	2.5
Third	1965-70	1740.0	52.5	3.0	1779.1	...	..
Fourth	1970-75	3540.0	80.8	2.4	...	...	..
Fifth	1975-80	10298.5	196.2	1.9	9939.2(c)	141.5(d)	1.4
Sixth	1980-85	28000.0	764.0	2.7	...	...	..
Total	1956-85	44508.5	1126.9	2.5	...	...	..

Note: a - the figure includes only for the forestry sector
b - the figure includes for agriculture and forestry
c and d - the figures include only for 1975-79
(Source: various plan documents)

Based on Table 42, the forestry budget is graphically illustrated in Figures 17 and 18. Figure 17 illustrates the allocation of budget for forestry in various plans and Figure 18 illustrates the percentage of forestry allocation in the total plan estimate.

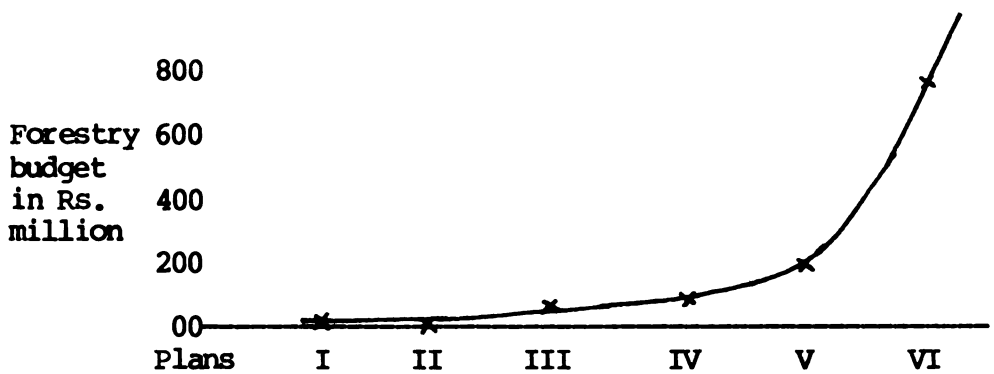


Figure 17. Forestry Budget in Six Plans
(Based on Table 42)

Figure 17 indicates a sharp rise in the forestry budget since the Fifth Plan. But Figure 18 shows that the percentage of the forestry budget in the total allocation of a plan had a declining trend. This calculation does not consider the inflation rate which also may have a

significant impact on the real value of Rupees (Rs.).

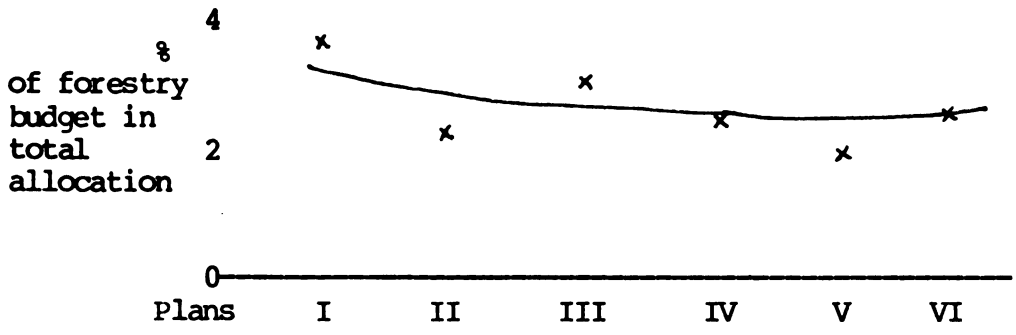


Figure 18. Percentage of Forestry Budget in Six Plans Estimated Budget (Based on Table 42)

Another observation made in the budgetary aspect of strategy is that conservation was considered solely a governmental sector and hence neither the panchayat nor the private sector had any direct allocation for forestry so far.

Comparison of Organizations

During 1951-56 there was a separate ministry for forestry which had two departments dealing with forests and botany respectively. The forest territory was divided into 2 circles, 9 divisions, 36 ranges, and 180 beats. The forestry school (or institute) was established in 1947 but remained closed for 1951-56 period.

The territorial organization was created into 7 circles and 22 divisions, which underwent changes in 1958 but revived again in 1959. The TCN was established in 1959, and the Institute of Forestry was reopened in 1956. A new ministry was formed to deal with agriculture and forestry in 1961. The same year the Forest Resources Survey was established and the Department of Botany was renamed as the Department of Medicincal Plants. The Office of the Chief Forest Officer (DF) was

also expanded in 1961.

In 1965 a separate MF was created. The Nepal Resettlement Company was established in 1964. The territorial organization was expanded into 14 circles and 75 divisions but after a few months again reverted into the original 7 circles and 22 divisions in 1967. The Office of the Bagmati Zone Afforestation Scheme was established in 1967. The Major Forestry Offices were created in 1969. The wildlife, administration and hunting sections were added to the CCF Office. The Forest Products Sales and Distribution Corporation was formed in 1968 and dissolved in 1969.

The Resettlement Department was established in the early 1970s. The Institute of Forestry was transferred to TU. The Office of the National Parks and Wildlife Conservation was formed in 1973. Two more forest divisions were added by 1974. Commissions were formed to regulate resettlement in the Terai in 1973 and in 1975.

In 1974 the DSWC was established under the MF. The Nepal Resettlement Company and the Resettlment Department were transferred to the MF. The armed forest guards were recruited.

The Resettlement Board for Jhapa and Biratnagar, the Forest Products Development Board, and the Shivpuri Watershed Area Development Board were formed in 1976. The CCF Office was renamed as the DF. The Nepal Forestry service was administratically organized.

The DSWC was renamed as the DSCWM in 1980. The MF was also renamed as the MFSC. In the early 1980s 2 departments and 1 corporation were established under the MFSC as follows:

1. Department of National Parks and Wildlife Conservation
2. Department of Drug Administrations
3. Herbal Production and Processing Company Limited

HMG announced the merger of three forestry corporations into one, they were the TCN, the Fuelwood Corporation, the Forest Products Development Board. The district forest offices were created by gradual elimination of the forest divisions. The National Resource Conservation Commission and the local watershed committees were formed.

A chronology of conservation related organizations since 1951 is compiled in Table 43.

Table 43. Chronology of Conservation Organization Since 1951

1951:February 18, 1951 - A new era began in Nepal with the end of the Rana family rule. The MF was formed. The forestry institute remained closed. 2 circles, 9 divisions, 36 ranges and 180 beats were created.
1952:The Ministry of Forests and Revenue was created.
1955:The post of Chief Forest Officer was created to lead the DF.
1956:Expansion of territorial organization into 7 circles and 22 divisions. The forestry institute reopened.
1958:The Chief Forest Officer was merged into the MF and the five directors began to administer the forestry organization.
1959:The original 7 circles and 22 divisions were revived and the CCF was created to lead the Department of Forests. The TCN was established.

1960:The Ministry of Forests and Agriculture was formed.
1961:The CCF Office was expanded into five major sections viz. forest development, forest utilization, forest research, wildlife management, and plantation. The Forest Resources Survey Office was established. The Department of Botany was renamed as the Department of Medicinal Plants
1964:The Nepal Resettlement Company was formed.
1965:The MF was separately created.
1967:The forest territory under the CCF Office was expanded into 14 circles and 75 districts. After a few months, the original 7 circles and 22 divisions were revived. The Office of the Bagmati Zone Afforestation Scheme was formed.
1968:The Forest Products Sales and Distribution Corporation was formed.
1969:The above Corporation was dissolved. The Major Forest Offices were created.

1971:The Resettlement Department was established in the early 1970s. The Nepal Forestry Institute was renamed as the Institute of Forestry and transferred to TU.
1972:The Sarlahi District Resettlement Commission was formed.

Table 43. (Continued)

1973:The National Parks and Wildlife Conservation Office was formed. The Surkhet Forest Division was created.
1974:The Karnali Forest Division was created. The DSWC was established.
1975:A forestry investigation commission was formed.
1976:The Jhapa Biratnagar Resettlement Board was formed. The CCF Office was renamed as the DF. The Nepal Forest Service was administratically organized. The Forest Products Development Board was formed. The Shivpuri Watershed Area Development Board was formed.

1980:The DSWC was renamed as the DSCWM.
1981:The Department of National Parks and Wildlife Conservation, the Department of Drug Administrations, and the Herbal Production and Processing Company Limited were established in the early 1980s.
1982:The MF was renamed as the MFSC. The TCN, the Fuelwood Corporation and the Forest Products Development Board were merged into one body. The National Resource Conservation Commission and the district and village level conservation committees in selected watersheds were formed.
1983:The district forest offices were created by gradual elimination of the forest divisions.

Comparison of Technical Areas for Emphasis

As mentioned by Robbe (1954), the technical activities during 1951-53 were marking and sale of standing trees, and preparations of timber marking lists. Due to political disorders, all the forestry activities e.g. working plans and the logging operation were upset. Robbe (1954) suggested five major areas: soil conservation, reforestation, forest management, forest utilization and study of other countries.

During the First Plan (1956-61), reforestation, forest management and training personnel were initiated. Comparably, the Second Plan (1962-65) achieved more physical targets than did the First Plan. The plantation areas, forest management activities and the number of trained technicians increased. The Third Plan (1965-70) expanded the plantation works, but the rest of the activities remained almost

unchanged. The watershed management was also initiated. The area under new plantation was expanded in the Fourth Plan (1970-75). The watershed management works were also initiated in two spots. The actual progress of the Plan could not be made available. There were nine forestry projects during the Fourth Plan. The Fifth Plan (1975-80) launched 14 soil conservation projects. The area under new plantation increased in comparison with the area planted in the previous plan. But the actual progress was not encouraging. The Sixth Plan (1980-85) had 20 conservation related projects, most of them were continuation of those started during the Fifth Plan.

Reforestation was considered as the major technical area for emphasis towards conservation. The data in Table 44 gives the figures for the reforested areas during each plan.

Table 44. Reforestation Target and Progress (1956-1980) in Hectacers

Plan period	First 1956-61	Second 1962-65	Third 1965-70	Fourth 1970-75	Fifth 1975-80	Total 1962-80
Target	—	4,049	10,121	8,000	20,000	42,170
Progress	61.5	2,454	4,150	7,300	9,864	23,768
% Progress	—	61	41	91	49	60.5

(Based on Tables 22, 26, 28, 31 and 35)

During 1954-80 the total deforestation was approximately 29,000 sq km. During 1975-80 alone it was 7,233 sq km (Table 12). Thus the rate of reforestation in the last three decades was insignificant in comparison with that of deforestation of the same period.

The soil conservation projects in various parts of the country had shown good results, but their significant impact on the total environment of the country has yet to come. As shown in Table 39, the CFDP showed a remarkable progress. Technically, the large scale

plantation and soil conservation measures through people's participation have to be emphasized for the decades to come.

Comparison of People's Participation Strategies

In 1951 the forced labor "Jhara" was abolished. People's indigenous efforts like the Shingo naua system of the Sherpas were effective in keeping the local forests conserved. During the First Plan (1956-61), the local people were not involved in planning. There were government efforts to motivate the local people in reforestation. But the policy of nationalizing the forests adversely affected the participatory attitudes of the people in forestry.

In the Second Plan (1962-65), the panchayat sector was created in order to close the government-people gap in development works. But the level of participation was expected only at the implementation stage. The projects freely designed and implemented by the panchayats were those which need not have any government support in terms of finance, technical know-how and material.

The Third Plan (1965-70) expanded the panchayat sector with the emphasis on "the mobilization of labor". The panchayats were involved mostly at the implementation level of the government projects. The "Go to Village" campaign brought people's participation in plantation programs. Planning from the below was also theoretically accepted. However, the final decision on the programs formulated from below remained with the policy makers. Moreover, forestry or conservation was not among the priority list of the panchayat sector.

During the Fourth Plan (1970-75) also people's participation did not materialize at the various levels of a program. On the contrary,

illegal encroachment to the forests increased. Several thoughts were published in order to enlarge the participation base of the development projects. Specifically, the suggestions included to expand people's participation to the levels of decision making and benefit sharing.

A chronological review of people's participation during various plans is listed in Table 45.

Table 45. Chronology of People's Participation Strategy (1951-84)

1951-56: The "Jhara" was abolished. The "Shingo naua" and similar indigenous system of local conservation systems were in practice.
1956-61: The "Shingo naua" etc. gradually eroded following the policy of forest management through government bodies.
1962-65: The panchayat sector was created in the national development plan. People's participation in forestry was not encouraging.
1965-70: People's participation was mostly sought at the implementation level. The "Go to Village" national campaign emphasized people's participation in afforestation.
1970-75: People's participation in conservation could not practically materialized. Illegal encroachment to the government forests increased. Thoughts on the strategy of people's participation in development were provoked.
1975-80: HMG principally agreed to conserve forestry by the people. Awareness in conservation among the social organizations and the general people increased. The participation base of some conservation projects was expanded to the levels of decision making and benefit sharing along with implementation.
1980-84: HMG practically envisaged people's participation at all levels of development by promulgating appropriate legislations. The conservation projects fundamentally envisaged people's participation as the main strategy.

The planners of the Fifth Plan (1975-80) realized that people's participation was no less important than any other physical resources. Theoretically, many practical thoughts were advanced in order to promote people's participation in development. People's participation was seriously considered important in all conservation related works.

The remarkable initiations during this period were increasing involvements of nongovernmental organizations, students and others.

The community forestry and the watershed management programs of the Sixth Plan (1980-85) were principally based on the active participation of the local people at the levels of decision making, implementation and benefit sharing. The evaluation surveys showed that people actively participated in conservation programs. In comparison with the previous plans, the Sixth Plan practically involved people in conservation right from decision making to benefit sharing. The Acts pertinent to people's participation were also promulgated.

Comparison of Legislation

During the pre-plan (1951-56) period there was not any scientific forest legislation in the country. The First Plan (1956-61) initiated three important Acts viz. the 1957 Private Forest Nationalization Act, the 1958 Wildlife (Protection) Act, and the 1961 Forest Act. These Acts increased government authority and responsibility over the forests covering almost half the land area of the country. Moreover, these Acts repealed the Rana time rules and circulars but also adversely affected the attitudes of the people towards forests. During the Second Plan (1962-65), amendements of the 1961 Forest Act, and the 1958 Wildlife (Protection) Act, further strengthened the forestry legislation.

During the Third Plan (1965-70) the 1967 Forest Protection (Special Arrangement) Act, the 1970 Hunting Rules, and the 1970 Forest Products (Sales and Distribution) Rules were created. The amendments of the forestry Acts were also promulgated in order to make them more

precise and effective.

The important Acts and the Rules promulgated during the Fourth Plan (1970-75) were the 1971 "Jhora" Lands Act, the 1973 National Parks and Wildlife Conservation Act, the 1974 National Parks and Wildlife Conservation Rules, and the 1975 Royal Nagarjung Forest (Entry and Sale of Forest Products) Rules. The amendments of the Acts were also promulgated.

During the Fifth Plan (1975-80) the following Orders and the Rules were formulated:

1. The Nepal Forest Service (Classification, Gradation, Appointment, and Promotion) Rules, 1976
2. The Shivpuri Watershed Area Development Board (Formation) Order, 1976
3. The Forest Products Development Board (Formation) Order, 1976
4. The Lease Forest Rules, 1978
5. The Panchayat Forest Rules, 1978
6. The Panchayat Protected Forest Rules, 1978

In 1980 the amendments of the Rules pertaining to the PF/PPF were promulgated. These Rules provided that the panchayats manage the local forests for the benefits of the local people.

The Sixth Plan (1980-85) enacted the 1982 Soil and Watershed Conservation Act which provided technical inputs and the arrangement of conservation committees at the local level. The 1982 His Majesty King Mahendra Nature Conservation Fund Act and the 1982 National Parks and Wildlife Conservation (Second Amendment) Act were also enacted. The 1984 Private Forest Rules were formulated.

Other related Acts were also enacted and amended during 1956-1982, such as the Acts pertaining to the land administration and

reform, the 1976 Mountaineering Expedition Regulation, and the 1982 Decentralization Act.

Based on the above review and the discussions made under the subheadings of Legislation, two eras of legislation can be visualized. The first era (1956-76) had the policy of protection through laws and had the legislation which empowered the government agencies to protect the forests. The 1957 Private Forest Nationalization Act, the 1958 Wildlife (Protection) Act, the 1961 Forest Act, the 1967 Forest Protection (Special Arrangement) Act, the 1973 National Parks and Wildlife Conservation Act, and the Rules and the Orders pertaining to these Acts were aimed to protect the forests through strict legislation which also included armed forest guards.

The second era (1977-1984) emerged to protect the forests through people's participation. The remarkable points of this era were the Rules pertaining to the PF/PPF and the private forests, lease forests, free sapling distribution, the Acts pertaining to the formation of the local conservation committees. The remarkable fact was that the 1982 National Parks and Wildlife Conservation (Second Amendment) Act provided facilities for the local people to enjoy the forest products from the parks.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Procedure Summarized

The purpose of the study was to describe and analyze conservation strategies of Nepal advocated by HMG during the period 1951-1985. The strategies were identified as objectives, priority, budget, organization, technical areas for emphasis, people's participation, and legislation.

Two research questions that were advanced for this study were as follows:

1. What were the conservation strategies recommended in the individual national development plans of Nepal during 1951-1985 ?
2. What changes in conservation strategies occurred in the individual national development plans during 1951-1985 ?

In an attempt to answer the above questions, Chapter III presented a description, analysis, and comparison of conservation strategies on the basis of the format shown in Table 1.

The primary sources of information were the plan documents and the other government or government authorized publications. Similarly, information from secondary sources were also used by crediting both the government as well as the respective author(s).

Findings Summarized

Objectives

During the 1950s and the 1960s the objectives of the national development plans were focused on infrastructures, raising production, employment opportunities, economic stability, foreign trade, social justice, etc. During the 1970s the objectives inclined towards the appreciation of conservation along with the other developmental needs. By the turn of the decade 1980s one of the five national objectives was for conservation.

Priority

Forestry (or conservation) was placed within the Agricultural Sector which received second priority in the First, Third and the Fourth Plans, the fourth priority in the Second Plan and the first priority in the Fifth and the Sixth Plans. However, the sectoral priority did not reflect the actual priority given for the conservation sub-sector. Conservation was only one of several sub-sectors within the wide sector of Agriculture, e.g. agronomy, horticulture, livestock, irrigation, land-reform, resettlement and others.

Budget

Except for the First Plan which allocated 3.6% of the total plan budget to forestry (but was not all spent), the other plans allocated between 2 to 3% of the total plan budget to forestry. The amount of forestry budget increased by nearly 60 times from the Second Plan to the Sixth Plan. The total plan budget also increased by nearly 50 times during the same period. The inflation rate was not considered in this calculation. The actual expenditures could not be made available.

Organization

The MFSC was a separate organization for most of the period during the 1950s. It was attached to agriculture for the period 1960-1965. Since 1965 it remained a separate HMG body. During the 1950s and the 1960s it had two departments and a corporation. It was rapidly expanded during the 1970s and the 1980s. In 1984 it consisted of six departments and four corporations (counting one for the three forestry corporations that were merged in 1983).

Technical Areas for Emphasis

Reforestation

The activity was initiated as early as the late 1950s and the area under new plantation gradually increased. However, only about 60.5% of the total target for the period 1962-1980 was achieved. By 1980 the total accumulated plantation area was about 23,768 hectares without considering their mortality factor.

From 1980 to 1983 the CFDP alone added about 4000 hectares of new plantation. The total target for the period 1980-85 was around 72,027 hectares.

Forest management

During the period 1956-70 the main activities were focussed on demarcation, fireline, path, and buildings. The activity of demarcation continued for the period 1970 to 1984. The working plans for the divisions were initiated during the period 1965-75. Such plans for the PF/PPF were also initiated by CFDP during 1980-84.

Watershed management

Soil conservation works in a few places were initiated during the period 1965-75. During 1975-80 there were 14 soil conservation (or

watershed) projects launched in different parts of the country. The number of such projects was 11 for the period 1980-85. The major activities of such projects were plantation, gulley control, and terracing, etc.

Wildlife management

The sancturies and refuges were established during 1956-65. The national parks and the reserves were established and managed during 1965-70. Management of the parks and the reserves continued in the 1970s and the 1980s. In 1984 there were seven national parks and two wildlife reserves; in addition, four hunting reserves were proposed.

Extension service

The Forest Festival was started in the First Plan (1956-61). During 1965-75 some sporadic efforts were initiated in order to focus people's attention on tree planting. Extension education in wildlife management and soil conservation was initiated during the 1970s. Since 1980 extension was included as the complementary part of reforestation and other conservation activities.

Survey

An extensive survey of the natural resources was started in the 1960s. Aerial photography in forest survey was introduced in 1962-65. Interpretation of satellite imageries began in the late 1970s. Detailed surveys for the specific purposes were proposed and implemented since 1980.

Research

Initiation was taken in the late 1950s and also in the late 1960s. During the 1970s and the 1980s research activities were included in the conservation projects.

Training

Training of the middle- and lower-level forestry technicians was restarted in 1956. Until 1980 the higher-level forestry technicians were trained abroad. During the period 1980-85 the training institution was expanded in terms of number and up to the graduate level. In-service training was also institutionalized in the 1980s.

People's Participation

The local indigineous system of conservation by the people gradually disappeared in the late 1950s. The panchayat sector was created in the national development plans in the early 1960s. People's participation was sought mainly at the implementation level of development works. The modern thoughts of people's participation were developed in the early 1970s. The government principally agreed to conserve forests through people's participation. By the turn of the 1980s HMG practically envisaged people's participation at various levels of conservation programs.

Legislation

During the period 1957-1976 HMG enacted and amended six Acts, five Rules, and two Orders that were directly related to the conservation of the natural resources. That legislation was intended to conserve the natural resources through strict laws and regulations.

Since 1977 to 1984 HMG radically changed policy by creating new legislation and by amending the old ones. The objectives of these changes were to conserve the natural resources through mutual cooperation between the local people and the government officials. Since 1977 there had been two Acts and four Rules pertaining to conservation of the natural resources.

Conclusions

1. The national development plan incorporated conservation in the main objectives since 1980.

2. The Agricultural Sector which also included conservation received first priority since 1975.

3. A priority specifically for conservation was not clear in the plans.

4. The amount of budget allocation for the conservation programs increased over the years in the various plans.

5. The proportion of the conservation budget to the total plan budget remained constant between 2 to 3%.

6. Frequent changes of major organizational structures were conspicuous throughout the period 1951 to 1984.

7. During the 1970s and the 1980s organizational expansion took place more rapidly than during the preceeding decades.

8. The technical measures taken before 1980 were less effective in keeping pace with the population explosion and in competing with other land-use developments e.g. resettlement, agriculture, roads, etc.

9. Preventive technical measures e.g. reforestation, soil conservation and wildlife management began to be emphasized during the 1970s.

10. Sporadic efforts in extension were initiated in the 1950s and the 1960s, but were institutionalized only since the late 1970s.

11. The technical measures, although ineffective in bringing out significant impact, included adoption of contemporary technologies such as aerial photography in the early 1960s and satellite imagery

interpretation in the 1970s.

12. Throughout the period, since 1951 to 1984, research was given the least attention among the other technical efforts.

13. Before 1980 the in-country training institution did not supply the sufficient number of middle- and lower-level technicians. The expansion of training facilities including graduate level study of conservation in the early 1980s may contribute in future.

14. The training of higher-level (graduate and post-graduate) technicians was made available abroad.

15. The in-service training was institutionalized in the early 1980s.

16. The indigenous conservation efforts of the local people, e.g. the Shingo naua, disappeared in the 1950s.

17. During the 1960s people's participation was sought only at the implementation level of conservation projects.

18. During the 1970s people's participation at all levels e.g. decision-making, and benefit-sharing was felt needed in conservation.

19. People's participation at all levels was institutionally recognized in the 1980s.

20. Until 1976 the legislation empowered the government agencies to have an authoritative control over the natural resources and thus greatly increased their responsibility.

21. Since 1977 a radical change in government policy resulted in the enactment and amendment of legislation by authorizing the local institutions to have more control over the conservation programs.

22. In the early 1980s the Act pertaining to land-use was enacted for the first time.

23. Conservation was handled as an individual development program in all the national development programs.

Implications

Several implications can be drawn based on the conclusions of this study. The conclusions were drawn up from a study of development plan documents and the reports of conservation programs within such plans. Many other HMG development programs, non-governmental activities, and the bi- and multi-lateral HMG projects with the international agencies have probably formulated specific strategies that were also relevant to the conservation of the natural resources. Hence, the conclusions do not necessarily reflect the strategies advocated by HMG in other developmental fields, and those advocated by HMG in collaboration with the other international agencies which were involved in conservation of Nepal. Within these limitations of this study, the following implications are drawn up:

1. If conservation of natural resources is to significantly contribute towards the sustained development of the country, conservation strategies should be envisaged in all developmental programs, rather than promoting conservation as an individual program. Findings of this study indicated that the individual efforts in conservation were technically appropriate and timely but ineffective in restoring the deteriorating environment as there was a competetion for other land-use developments e.g. resettlement and agriculture.

2. If conservation is a continuous process, especially in a mountainuous country like Nepal, the DSCWM should be expanded by establishing permanent offices at the village, district and regional levels. The study findings showed that the DSCWM had only the project

offices at the village or district levels and they were temporarily established for the periods of the projects.

3. If one of the strategies of the present conservation efforts is to develop scientific land-use throughout the country, the legislation pertaining to land-reform should contain land-use policy as well. The study findings showed that the conservation oriented legislation did not cover all the agricultural and resettled lands in the country.

Further detailed studies are suggested in the following areas:

a. Qualitative and evaluative assessment of the present technical areas for emphasis.

b. Strategies advocated by HMG to develop other fields which affect the natural environment e.g. agriculture, road, resettlement, tourism etc.

c. Methods of people's participation in near future when the present plantation crops start providing initial benefits.

d. Effectiveness of present organizational structures.

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