SUSTAINABLE DEVELOPMENT PLAN OF MANANG

SUSTAINABLE DEVELOPMENT PLAN

MANANG

(2008—2013)

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UNEP

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SUSTAINABLE DEVELOPMENT PLAN

MANANG

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MESSAGE

Date: May 20, 2008

The Ministry of Forests and Soil Conservation is very pleased to know about the preparation of the Sustainable Development Plan of Manang District. As the Ministry is concerned with the sustainable use of natural resources, especially renewable ones such as forests and soil, it is very much encouraged by the strong focus of the Plan on the critical aspects of sustainable development. I strongly feel that this Plan will be instrumental to establish Manang district in the country's new perspective. It is highly anticipated that the Plan will contribute for the development of 'New Nepal' and to take Nepal in the path of sustainable development.

The success of any plan is in its smooth implementation. The Plan has identified the role of different institutions at different levels as well as the resources needed. Along with the people of Manang, it is now a challenge for all concerned to ensure that the Plan is successfully implemented. The Ministry will provide all the help it can to directly support the implementation as well as facilitate the mobilization of other sources of support. The people of Manang deserve our utmost recognition in their quest for a sustainable future.

I would like to thank the Regional Office of UNEP and all others who have contributed to this exercise and to National Trust for Nature Conservation for the initiative and coordination of this important exercise.

Matrika Prasad Yadav
Hon. Minister
Ministry of Forests and Soil Conservation
Government of Nepal
and
Chairman
National Trust for Nature Conservation

Jawalakhel, Lalitpur, P.O. Box : 3712, Kathmandu, Nepal, Tel : 5526 571, 5526 573, Fax: 977-1-5526 570,

PREFACE

"Fifty Years of Planned Development"

Government of Nepal

National Planning Commission

Jagadish C. Pokharel, Ph. D.
Vice-Chairman

Ref.:-

Disp. No.:

Date: May 15, 2008

Annapurna Conservation Area (ACA) is a treasure house of wide range of biological resources, cultural heritage and diverse natural landscapes. Diversity and uniqueness have made the area as one of the most important tourist destinations in Nepal. Similarly, successful design and implementation of integrated conservation and development programme in ACA by the National Trust for Nature Conservation (NTNC) has made the protected area a global model of community-based conservation. Recently, Government of Nepal has initiated to construct road networks to connect Manang district as part of the National Planning Commission's (NPC) programme to link district headquarters by road networks. As reflected in the Poverty Reduction Strategy Paper of the 10th Five Year Plan, NPC considers road networking as a key strategy for poverty reduction. On the other hand, ACA is a protected area with a global significance. Hence, development of a road network and the changes it will bring in the protected area must be well understood and a better strategy should be adopted to sustainably protect the area while maximizing the benefits of development to the local communities.

The National Planning Commission welcomes this effort by the National Trust for Nature Conservation (NTNC) to develop the Sustainable Development Plan for Manang district. The NTNC is uniquely placed to organize such an exercise because of its critical role in working together with the local people in the conservation of natural resources of the district. The people of Manang are on the way to improve their quality of life and the Plan has addressed this through its different components. The preservation of the unique cultural resources of the district as highlighted by the First Objective of the Plan is an important thrust. Similarly, the Plan has also addressed other critical areas such as basic infrastructure, productivity enhancement of economic activities, tourism development and management of settlements. It has identified the resources needed and the institutional structures and roles for the successful implementation of the Plan. This Plan suggests priority areas for investment while protecting the fragile environment and delicate relationship of people with nature.

I am also very pleased to note that the Plan has taken full cognizance of the Three Year Interim Plan and identified all the important sectoral policies emphasized by this Plan. I am hopeful that this will help to integrate most of the proposed activities with the priorities of the government. The Sustainable Development Plan, first of its kind at the district level in Nepal, will guide the district to enhance the quality of human life through balanced progress in economic, social and environmental conditions. The National Planning Commission will facilitate relevant organizations for successful implementation of the Plan.

I would like to thank the Regional Office of UNEP, National Trust for Nature Conservation (NTNC), the people of Manang and the different members of the Study and the Plan Review Team for a work well done. I hope the respective national agencies and local bodies will adopt the Plan and play an active role in its implementation.

PREFACE

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Jagadish C. Pokharel, PhD.
Vice Chairman
National Planning Commission

FOREWORD

NATIONAL TRUST FOR NATURE CONSERVATION

Date: May 28, 2008

Development which meets the needs of the present without compromising the ability of future generation to meet their own needs is the concept of Sustainable Development used by the Brundtland Commission Report (1987). This concept should be the main basis for the development of "New Nepal" in the changed political context.

Recognizing the importance and relevance of the concept, the National Trust for Nature Conservation, which is promoting conservation and sustainable development, has taken the lead to develop the Sustainable Development Plan of Manang. The main objective is to systematically develop the district in an integrated, planned and holistic manner. The Plan has successfully integrated all four pillars of sustainable development, which includes environmental, economic, social and cultural spectrum of Manang. Better understanding the dynamics of these four pillars and effectively integrating these in the development process will always help to find pragmatic solutions and we believe that it is possible to solve development problems in better ways.

'Conservation for Development' is the key theme promoted by the Trust in the last two decades both in the mountain and Terai regions. The Sustainable Development Plan for Manang reinforces our commitment to balanced conservation and development in the Annapurna Conservation Area. We believe that this Plan will be a guiding document for transforming the district with a high quality of human life through balanced progress in economic, social and environmental conditions.

I would like to extend my sincere thanks to UNEP for their valuable support to prepare the document, and for their critical comments and suggestions in enriching the Plan. I would also like to extend my sincere appreciation to the Plan Study Team, Review Team and NTNC team for their hard work and commitment to successfully produce the document.

Finally, I would like to express my sincere thanks to Dr. Siddhartha B. Bajracharya of the Trust for leading the project and bringing out this document in its present form.

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Bimal Kumar Baniya
Member Secretary
National Trust for Nature Conservation

ACKNOWLEDGEMENTS

The National Trust for Nature Conservation (NTNC) with the support from the United Nations Environment Programme Regional Office of Asia and the Pacific (UNEP/ROAP) take this opportunity to thank the study team and the Plan review team for developing this valuable document. The Trust would particularly like to thank Dr. Jagannath Adhikari, Mr. Shailendra Thakali, Prof. Karan B. Shah, Dr. Sunil B. Shrestha, Dr. Mahesh Banskota, Prof. Ram Prasad Chaudhary, Dr. Kailash N. Pyakuryal and Mr. Deependra Joshi. The Trust would like to especially thank Dr. Siddhartha B. Bajracharya for taking the lead in the development of the Plan from the very beginning.

The Plan could not have been prepared without the cooperation of a large number of partner organizations and the help of many individuals who generously contributed their time, energy and expertise to its research, drafting and production. The Trust is grateful to the UNEP team in Bangkok for their continuing support and encouragement, especially Mr. Surendra Shrestha, Dr. Aida Karazhanova, Dr. Subrato Sinha and Mr. Purna Chandra Lal Rajbhandari. We would like to recognize the contribution of UNEP for their feedbacks on the draft documents, and Dr. Pitamber Sharma, which definitely helped us to improve it. The NTNC would also like to express its gratitude to Dr. Shankar P. Sharma, former Vice Chairman of the National Planning Commission for the concept and encouragement to develop the Sustainable Development Plan of Manang district. We would also like to thank all the officials working with the government and non-government agencies in Manang district and also to the meeting/workshop participants held in Manang and Kathmandu for providing their valuable feedbacks in developing this Plan.

In addition, the Trust would like to thank the staff members of NTNC central office for their support during the preparation of the Plan, particularly Mr. Ganga J. Thapa, Mr. J.R. Onta, Mr. Deepak K. Singh, Dr. Shanta R. Jnawali, Mr. Ngamindra Dahal, Mr. Kirti N. Poudel, Mr. Bidur Pokharel, Mr. Binod Basnet and Ms. Rupa Basnet. Similarly, we would like to thank NTNC team members in ACAP Pokhara, Jomsom, Lo-Manthang and Manang, particularly Mr. Lal Prasad Gurung, Mr. Manish R. Pandey, Mr. Raj Kumar Gurung, Mr. Nawa Raj Chapagain and Ms. Hari Maya Gurung. Former NTNC/ACAP staff members, Mr. Roshan Sherchan, Mr. Lizan Kumar Maskey and Ms. Anu Kumari Lama also contributed to the development of the Plan.

Last but not least, we would like to extend our gratitude to the local people of Manang for their high interest and support in the Plan preparation and providing their inputs to improve it.

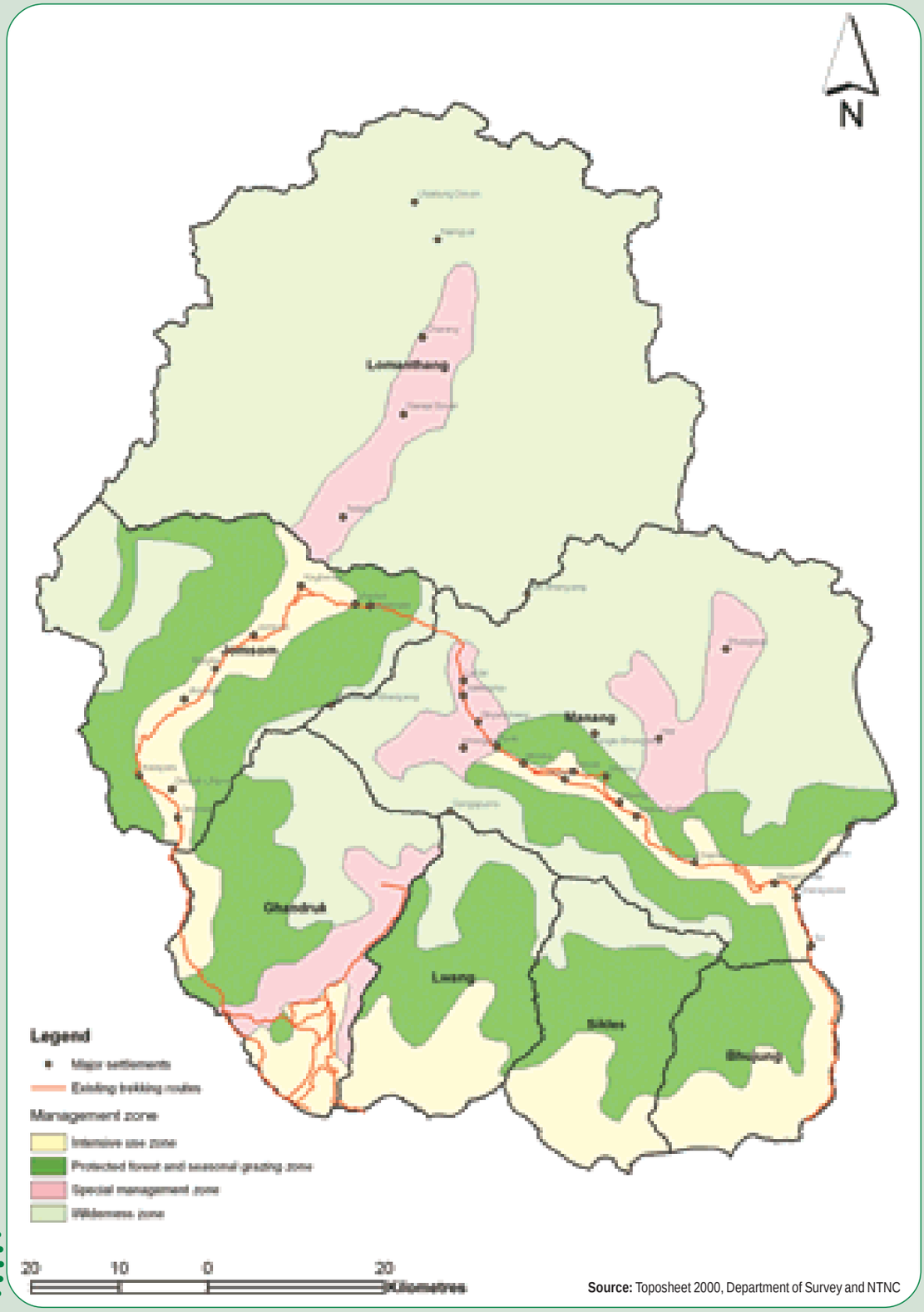
National Trust for Nature Conservation
June 2008

ACRONYMS

ACA	Annapurna Conservation Area
ACT	Annapurna Circuit Trek
ACAP	Annapurna Conservation Area Project
CAMC	Conservation Area Management Committee
CAMR	Conservation Area Management Regulations, 2053 BS
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DCAMC	District Conservation Area Management Committee
DDC	District Development Committee
DNPWC	Department of National Parks and Wildlife Conservation
EIA	Environmental Impact Assessment
GLOF	Glacial Lake Outburst Flow
ICDP	Integrated Conservation and Development Programme
IEE	Initial Environmental Evaluation
INGO	International Non Governmental Organization
IUCN	The World Conservation Union
KMTNC	King Mahendra Trust for Nature Conservation (now NTNC)
MAPs	Medicinal and Aromatic Plants
MDG	Millennium Development Goals
NGO	Non Governmental Organization
NPC	National Planning Commission
NRDB	National Red Data Book
NTFP	Non-Timber Forest Product
NTNC	National Trust for Nature Conservation
PRSP	Poverty Reduction Strategy Paper
SD	Sustainable Development
SDAN	Sustainable Development Agenda of Nepal
SDP	Sustainable Development Plan
SRN	Strategic Road Network
STD	Sexually Transmitted Diseases
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
VDC	Village Development Committee
WHO	World Health Organization

TABLE OF CONTENTS

Map 1: Management Zone of Annapurna Conservation Area



Source: Toposheet 2000, Department of Survey and NTNC

CHAPTER 1

Photo © NTNC

1.1 Introduction

Manang is located in the trans-Himalayan region and covers about 25% of the Annapurna Conservation Area *(Map 1)*. In the past, it was known for transit trade between Nepal and Tibet. Lately, it is well known for trekking tourism. The district is also unique for biodiversity richness, spectacular sceneries, local culture and tradition.

Until now, Manang district is roadless. This has presented many barriers for development. The Poverty Reduction Strategy Paper (PRSP) of Nepal has identified road networking as a key strategy to achieve poverty reduction goal and targets. In line with this policy, a road construction project has also started linking Manang district with other road networks in the country. This road could open many opportunities, choices and options for poor people to build sustainable livelihoods and reduce the impacts of vulnerability to different types of stresses.

On the other hand, it could also widen economic disparity, accelerate environmental degradation, heighten cultural disintegration and contribute to the haphazard growth of settlements and urbanization. These issues need to be resolved timely in order to maximize the benefit of road and reduce adverse impacts. The National Planning Commission (NPC) and the National Trust for Nature Conservation (NTNC), previously known as King Mahendra Trust for Nature Conservation (KMTNC), have collaborated with the United Nations Environment Programme (UNEP) in developing this comprehensive Sustainable Development Plan of Manang district.

1.2 Objectives

The basic objective of this exercise has been to develop a comprehensive Sustainable Development Plan for Manang. The specific objectives are:

- To review and assess current contribution and the role of ongoing projects and programmes, including road construction;
- To present opportunities, possibilities, constraints and alternatives for creating a model district on sustainable development within the country and the region;
- To develop clear objectives and activities for sustainable development of the district;
- To define appropriate partnerships for sustainable development of the district; and
- To define necessary preconditions for the successful implementation of the Plan.

1.3 Methodology

The methodology used for the preparation of the Sustainable Development Plan of

Manang district has been the following:

i. Secondary information about the development problems, efforts and sustainable development issues of Manang was collected and analyzed.
ii. Field work was carried out to understand the context of sustainable development through interaction with various stakeholders.
iii. A series of meetings and discussions were held with government line agencies, NGOs, CBOs and other interest groups. Community consultations were held in various parts of Manang (*Table 11)*.
iv. Consultations were held with the staff members of NTNC and NTNC/ACAP.
v. Roadside informal interviews were also conducted to solicit views of those who are normally not represented in groups and do not get the opportunity to have their say.

Annapurna Conservation Area and its importance

Launched in 1986, the Annapurna Conservation Area Project is the largest undertaking of the NTNC and the first and largest Conservation Area in Nepal. ACA is located in the mountain region of the west-central Nepal at latitude 28˚50'N and longitude 83˚57'E. ACA covers an area of 7,629 sq.km. and is home to over 120,000 local people of different ethnic, cultural and linguistic groups. It is a very large area of Himalayan mountain ecosystem, which overlaps several bio-geographical region and holds a diverse range of habitats and species.

The Kali Gandaki Valley runs through ACA and is a bio-geographical divide in the Himalayan mountain chain. ACA, therefore, has species typical to the eastern and western Himalayas. The Kali Gandaki valley is also an important north/south bird migration route. ACA also lies within a region of overlap between the Palaearctic and Indo-Malayan realms and so has species of both realms. ACA has a huge altitudinal range spanning from 790 to 8091m. It has a great range of rainfall, with some of the driest regions in Nepal in the trans-Himalayan zone and some of the wettest region south of Annapurna in the Modi Khola valley.

Although some of the habitats may not be species rich, they hold important population of several globally threatened species, some of which are of exceptional intrinsic appeal (snow leopard). ACA is rich in biodiversity and is a treasure house for 1226 species of plants, 38 species of orchids, 9 species of rhododendrons, 101 species of mammals, 474 species of birds, 39 species of reptiles and 22 species of amphibians. It harbours rare and endangered wildlife species such as snow leopard, musk deer, Tibetan argali, impeyan pheasant and Tragopan pheasant.

ACA is well known internationally and in Nepal for its beautiful mountains and a unique ecology. The area is bounded to the north by the dry alpine deserts of Dolpo and Tibet, to the west by the Dhaulagiri Himal, to the east by the Marshyangdi Valley and to the south by valleys and foothills surrounding Pokhara. Some of the world's highest snow peaks over 8000m and the world's deepest valley of the Kali Gandaki river are in ACA. These extreme diversities have made it Nepal's most popular trekking destination with over 70,000 trekking tourists in the year 2000, which is over 62% of the total trekking tourists visiting Nepal.

Altogether, over 200 people representing various walks of life were consulted during the preparation of this Plan. A team comprising four multi-disciplinary experts was formed for the field study and preparation of the SDP. They visited Manang from 15 December 2006 to 6 January 2007 for field study and consultation with stakeholders.

1.4 Limitations

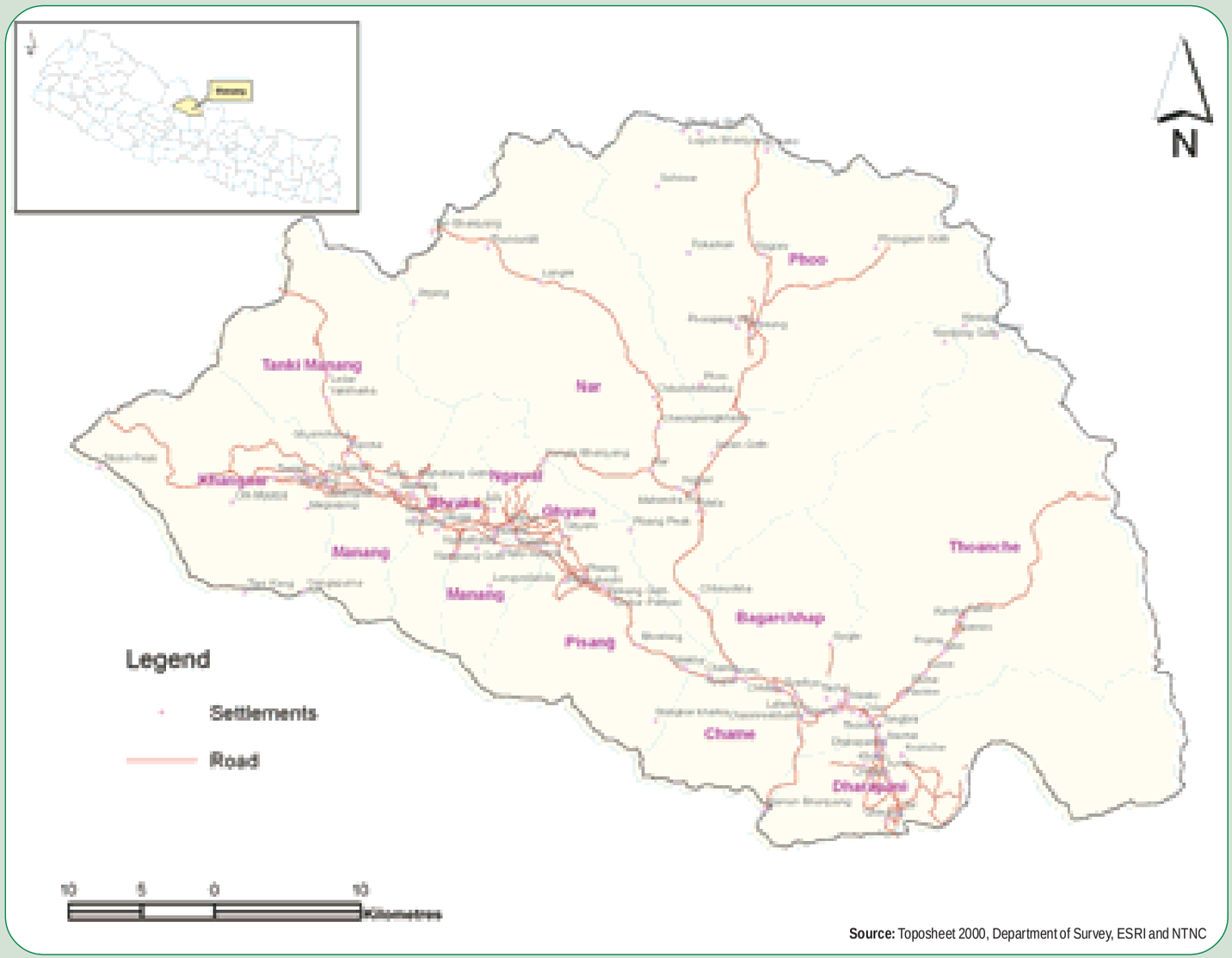
- There was a dearth of updated quantitative information on various social, economic and environmental aspects of the district. Data variations within the district were not available to a desired extent. As data and information obtained from different sources were inconsistent, it presented another major challenge. In many cases, there was inconsistency between national and district level information.
- People were hesitant to talk about the negative impacts of road because of the fear that this might jeopardize road project. People, particularly politicians and civil society leaders, were not open in their discussion.
- Data on environmental status of the district, particularly on pollution of various types, were completely lacking. The prevailing attitude was that since there is no road and population density is low, there is no problem with regard to environmental pollution. It was difficult, owing to constraints of time and resources, to generate knowledge and create baseline data on the state of environment of the district. The study team has tried its best to use the latest and reliable information available in developing the Sustainable Development Plan for Manang district.

1.5 Organization of the Plan

This Plan has been organized into eight chapters. Chapter 1 gives a general introduction. Chapter 2 describes the current socio-cultural, economic and environmental features of Manang district, and is aimed at providing background information about the district and its past development efforts. Chapter 3 identifies implications of the ongoing road project on sustainable development of the district. Possible threats and opportunities that road would bring in for the sustainable development of the district are also identified and discussed. Chapter 4 identifies emerging trends and issues in the district that have implications on sustainable development. Chapter 5 discusses the concept of 'sustainable development' which sets the framework for the Plan.

Chapter 6 covers vision, overall goal, objectives and activities of the Plan that are considered necessary for sustainable development in the light of changes brought about by road and to meet the expectations of people. Chapter 7 discusses the implementation strategy and the role of different agencies, including ACAP. Chapter 8 provides budget for the first five years and a monitoring plan for the Sustainable Development Plan of Manang, with various indicators that help in tracking the achievements and impacts based on the Plan's objectives.

Map 2: Location map of Manang district



Source: Toposheet 2000, Department of Survey, ESRI and NTNC

CHAPTER 2

MANANG: THE CURRENT STATUS

2.1 Introduction

- Manang (1880m–8136m), a trans-Himalayan district, is least populated and untouched by road network. It has a unique natural landscape, socio-cultural and religious features. It is rich in biodiversity and water resources, and thus, provides invaluable ecosystem services to the lower hills and the Terai region.
- Manang is one of the working districts of Annapurna Conservation Area Project (ACAP). ACAP was initiated as a form of integrated conservation and development programme in 1986, and covers an area of 7629 sq. km that spans over five of the seventy five districts of Nepal. ACAP has been designed and managed by NTNC.
- Manang lies in the largest protected area of Nepal and covers 25% of the region called 'Annapurna', located in west central Nepal, harbouring some unique natural and cultural features, including 57 endemic species of flowering plants *(Table 9)*. Some of the world's highest peaks and deepest valley are located in this region.
- This region had attracted up to about 80,000 tourists in a year. However, in recent times, tourist flow declined primarily due to armed conflict (1996-2006). But after a Comprehensive Peace Agreement signed between the government and insurgents in 2006, tourist flow has increased significantly. Annapurna region is

Manang's biodiversity resource

- Annapurna region is rich in biological and cultural diversity. Within a short span of 120km, the altitude varies from 1000m to 8000m, because of which there is high diversity in climate, flora and fauna. The area supports more than 22 forest types with an estimated 3430 species of plants, including 57 species (highest among all protected areas in Nepal) of endemic flowering plants out of 248 species in Nepal. Faunal species include records of 101 species of mammals, 478 species of birds, 41 species of reptiles, and 23 species of amphibians.
- Amongst the recorded species of fauna, Manang harbours three species of bird and 17 mammal species listed in CITES (*Tables 5 and 6*). Five of the recorded mammal species are protected by the National Parks and Wildlife Conservation Act (1973), and 11 are included in different threat categories of the IUCN Red Data Book. Mammal species symbolic to ACA are the snow leopard, musk deer, Tibetan Argali, Tibetan wolf, whereas bird species symbolic of the area are golden eagle, demoisell crane and various pheasants. (KMTNC 1997; Bhuju *et al*. 2007).

considered as one of the top 10 trekking destinations in the world and a top destination within Nepal.

- The region is also culturally rich. Various ethnic groups in the region still have retained their rich traditional life not only in material and cultural traits but also in the management of natural resources and community development.
- Considering the fragile environment and growing stress in Annapurna region, the government gave permission to KMTNC to implement ACAP in 1986. The basic principles of the project are people's participation, integrated conservation and development and sustainability. ACAP has 'sustainable development' in its core principles and its main objective is to conserve natural resources in Annapurna region for the benefit of the present population without degrading the natural resources for use by future generations.
- Until now, Annapurna Conservation Area Management Plan (1997) provides management guidelines. This plan was meant for five years and was developed without the consideration that there will be a road in the district. The ACAP has produced several planning documents for trans-Himalayan zone, but most of them are related to Mustang. In the light of sustainable development, it has been felt necessary that environmental considerations are effectively integrated into the development process of Manang.

2.2 Environmental Context

Land (land use, habitat and rangeland)

Manang district has been divided into three broad ecological-cultural zones, viz: Nyeshang (Upper Manang), Nar-Phoo and Gyasumdo (Lower Manang). Inhabitants residing in these different ecological zones are also distinct on cultural aspects. The district is rich in both cis-(temperate) and trans-Himalayan biodiversity ranging from the presence of most common to rare and endangered species.

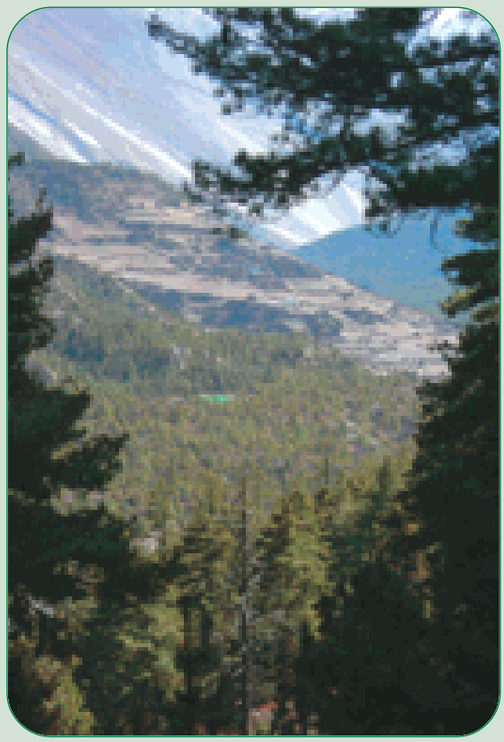


Photo © NTNC

Floral diversity: A study indicates the availability of about 500 species of plant in Gyasumdo valley (Shrestha and Sah 1995). These plants are used by local people for various purposes such as food, spices, fibre, medicine, fuel, dye, tannin, gum, resin, religious purpose, roofing and fencing materials, and handicrafts.

Faunal diversity: Manang is rich in mountain fauna such as snow leopard, red panda, blue sheep, Himalayan tahr and serow. The district has diverse avifauna, including lammergeier, Himalayan griffon and golden eagle.

Rangeland: Manang has 48,990 hectares of grazing land, which is about 22% of the district (Annual District Development Plan 2007). Rotational grazing is practised in the area. Based on such rotational grazing system, four types of pastures (Ale 1995), high elevation summer, low or medium elevation, briefly used and continuously utilized pastures are recognized in Gyasumdo valley, whereas two types (Magar 2002), summer and winter pastures, are recognized in Nyeshang and Nar-Phoo valleys. In fact, most of the accessible pasture lands are highly degraded due to over-grazing, which is believed to enhance the spread of unpalatable and alien species that adversely pose threat to mountain grassland's structural integrity.

Habitat diversity: Major wildlife habitats in the area are forests: mixed temperate broad-leaved, mixed conifer and deciduous broad-leaved, conifer and birch, subalpine scrublands and grasslands, dry alpine scrublands, alpine meadows and the Tibetan desert steppe. Aquatic bodies, cliffs and caves are minor natural habitats, whereas agricultural land and settlements are man made habitats.

Wetlands: Tilicho Lake, situated at an altitude of 4919m in Khangsar is the largest wetland of Manang. Gangapurna Lake in Manang, Mringchho Lake in Pisang, Dona/ Manaslu (4700m) and Ngyamcho Lake in Nache village, Ponkar and Himlung Lake in Bhimthang, Kecho Lake in Bhraka are other important wetlands from biodiversity, religious and tourism perspectives. These wetlands are important habitats for some resident and migratory birds with their surroundings and catchment areas rich in biological diversity. Major rivers and streams of Manang are Marsyangdi, Dudh khola, Nar khola, Phoo khola, Thorang khola, Sabje khola, Mada khola and Dona khola.

Air, water, solid waste, noise and soil pollution

- **Air pollution:** Air pollution is not a serious concern yet as the area has not been touched by road and there are no any significant industries. The external air quality is also good. However, domestic air quality (within households) has been seen as a problem. In various hotels and lodges, proper attention has been made to make the kitchen smoke-free, and hence, the level of indoor air pollution is insignificant. However, because of cold climate, residential windows are either not kept or are made small, and wind flow is obstructed within the house. As a result, higher concentration of pollutants has caused adverse impacts on health, thus making women, children and the elderly vulnerable to respiratory diseases. In the hospital, it was noted that acute respiratory infection has remained as one of the major problems owing to the increased level of indoor air pollution.

- **Water pollution:** Even though there is no problem of water pollution, the quality of drinking water seems low. In Chame, it was reported that water contains a lot of calcium and water purification plant has not been introduced. Water is supplied from the source to the pipe without proper treatment.
- **Solid waste:** The problem of solid waste is growing in densely populated areas like Chame. The ACAP has initiated solid waste treatment facility, which is insufficient. People burn plastics without taking into consideration environmental hazards. At present, tourist route is unaffected from solid waste pollution, but problem of disposing beer and water bottles is seen as one goes into the villages.
- **Noise pollution:** Noise pollution is not a serious concern so far. However, disturbing sound of vehicles along the road may cause harm, in particular to wildlife, including mammals and birds.
- **Use of chemicals and fertilizers:** There has been no significant use of chemicals, fertilizers and pesticides. People use organic inputs in farming. The government brings fertilizers only for experimental purposes.
- **Drainage:** The main problem for settlements is the lack of proper sewage system. Water is thrown on streets making it dirty, smelly and slippery to walk. Sewage problem is more rampant in Chame and Manang where water from taps and household use runs freely on the streets.

Wildlife

- The fauna of Manang has not been adequately studied. Almost no information is available on insects and birds. Grasshoppers and beetles are occasional insect pests on various crops (District Agriculture Development Office 2005). It is commonly believed that fish are rare in the district. Herpetofauna of the district is represented by seven amphibian species, eight lizard species and four snake species (Shah and Tiwari 2004). Snakes are seen only up to Bhratang (Karma Samde Ghale, CAMC Chairman, Bhraka, pers Comm.). According to Oli (1991), Upper Manang has diverse avifauna, including lammergeier, Himalayan griffon, golden eagle, white-capped river chat, Tibetan snow cock, Himalayan snow cock and chukar partridge.

Photo © NTNC

- At least 31 species of mammals are recorded in Manang (Oli 1991; Ale 1995). Forest leopard, snow leopard, wolf, wild dog and jackal are prominent predators and blue sheep, Himalayan tahr, goral, serow and barking deer are herbivore prey species.

- Although wildlife has economic, cultural and religious importance, recent conflicts between wildlife and people have increased. Wildlife damages of livestock and crops are serious concerns. Loss of livestock from wildlife makes conservation goal difficult. Local people see wildlife as enemy and their interest is to remove this loss at any cost. The most problematic livestock predator is snow leopard in Nyeshang and Nar-Phoo areas and forest leopard in Gyasumdo valleys (Oli 1991; Ale 1995; Thapa 2004).
- Oli (1991) estimated that out of 2737 domestic animals, 72 (2.6%) were lost due to wildlife from 1989 to 1990, while Jackson *et al*. (1994) determined that the overall rate was 2.8% in Khangsar village from 1990 to 1992. According to Thapa (2004), 278 livestock (47 yaks, 4 horses, 58 sheep and 169 goats) were killed by snow leopard in Phoo valley between April 1999 and April 2004. During 1991/ 1992, a forest leopard killed 27 small and large domestic animals in Lower Manang (Ale 1991). Crop damage by wildlife seems to be insignificant. Blue sheep have been reported raiding standing crops in Phoo valley (Thapa 2004).
- Despite strict prohibition imposed by the government, ACAP, local conservation bodies and 'Lamas' on the killing of wild animals, illegal hunting still continues for meat and income. Illegal hunters are said to have come from other districts. There are instances of some musk deer poachers being caught in Humde and Khangsar villages and punished by local villagers. In 2007, 13 snare traps set for killing musk deer were destroyed by the musk deer conservation joint committee members in Humde (Mangal Jung Gurung, Pers Comm.).
- Local villagers widely use all accessible lands for livestock grazing and collection of timber, fodder, fuel wood and medicinal plants. Deliberate and incidental forest and alpine grassland fire also occurs in the area. These activities inevitably impact wildlife habitats creating food shortage and general habitat disturbance. These activities may drive wild ungulates away to areas of sub-optimal habitat. Competition is likely to occur in Manang in the case of blue sheep and domestic goat because their foraging habits and regime are similar. Despite widespread anthropogenic activities, wildlife still abounds in many areas distant from the villages.

Vegetation (forests and NTFPs) and ethnomedicine

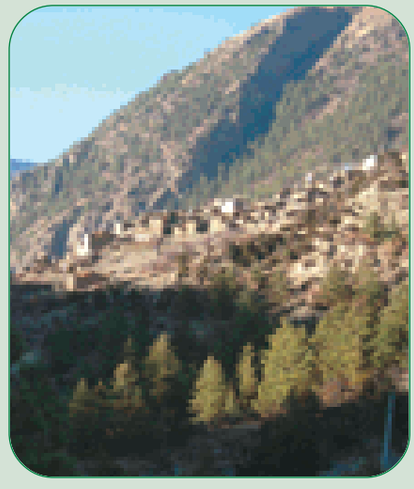


Photo © NTNC

- **Vegetation types:** Because of variation in climatic conditions, different vegetation types can be noticed– from subtropical to temperate, xerophilous and alpine formations. Forest vegetation in Gyasumdo valley is predominant with dense oak *(Quercus semecarpifolia)* and rhododendron forests in a lower belt and conifers *(Pinus wallichiana, Picea smithiana, Taxus baccata, Tsuga dumosa* and *Abies spectabilis)* and birch *(Betula utilis)* in the upper belt. Shrestha and Sah (1995) mentioned

Photo © Dr. Ram P. Chaudhary

Yarsagumba

Yarsagumba (*Cordyceps sinensis*) is most important medicinal plant due to its crucial role in the local economy. It provides livelihoods to many poor families of the district. It is found in 33 different pasturelands of different VDCs usually between 4000—5000m (Gurung 2003). It is collected at the end of monsoon where a collector pays Rs 500 to 5000 for getting permit to collect it in the field (Aryal 2004). *Yarsagumba* is exported to Tibet (China) mostly via Manaslu region of Gorkha district or through Kathmandu. According to Aryal (2004), people belonging to seven VDCs of Manang collected 79.6kg *of yarsagumba* in 2003 and 109.3kg in 2004. The VDCs earned Rs. 1.1 million in 2003 and Rs. 5.5 million in 2004 through permit fee. The local collectors earned a total of Rs. 7.5 million in 2003 and Rs. 15 million in 2004.

the occurrence of 13 vegetation types in the valley. Spruce *(Picea smithiana)* and hemlock *(Tsuga dumosa)* found in Gyasumdo are replaced by blue pine *(Pinus wallichiana)* forests with an upper belt of fir *(Abies spectabilis)* and birch *(Betula utilis)* in Nyeshang. Most of Nar-Phoo valley is situated above the timberline and the vegetation is enriched by steppe communities mostly *Berberis*, *Caragana*, *Rosa*, *Juniperus indica*, and *Lonicera* species (Pohle 1990).

- **Plant species:** Shrestha and Sah (1995) recorded 40 species of plants used by local people for medicinal purpose in Gyasumdo valley. Some of these medicinal plants are also found in different parts of Nyeshang and Nar-Phoo valleys. Yarsagumba, salep *(panchaunle)*, spikenard *(jatamansi)*, *silajit, jimbu*, seabuckthorn *(dalechuk)*, gentian *(kutki)*, satuwa, larkspur *(nirmasi)*, sweet root *(bojho)*, tikka, valerian *(sugandhwal)*, Himalayan rhubarb *(padamchal)*, ephedra *(somalata)*, *chirayato*, *tejpat*, morel mushroom *(guchchechyaun)*, *timur*, Himalayan yew *(launth salla)*, wild asparagus *(kurilo)* are prominent medicinal herbs.
- **Ethnobotanical knowledge:** A study conducted by Bhattarai, Chaudhary and Taylor (2006) in Upper Manang indicates that there is a wealth of ethnobotanical knowledge that still persists widely among the people. *Amchis* (traditional healers) feel that this healing system needs to be preserved and the knowledge passed on to coming generations. The prices of rare herbal medicine have increased dramatically and it is assumed that it can be one of the good sources of income. *Amchis* have recorded 91 species of medicinal plants belonging to 40 families and 73 genera in their study area in Upper Manang. Major problem, however, is the lack of enthusiasm among the youths to acquire, use and conserve the traditional ethnobotanical knowledge.

2.3 Socio-cultural Context

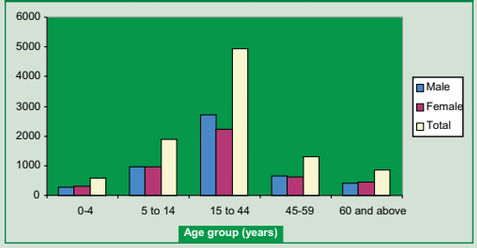
People and population

People of Manang are generally known as 'Manangi', but are composed of diverse group of people. Inhabitants residing in different ecological zones are also distinct

Photo © NTNC

in their cultural way of living. The Nyeshang and Nar-Phoo valleys are occupied by Buddhist people. The people of Nyeshang are called *Manangi* or Nyeshangba (Gurung) whereas the Nar and Phoo people are called *Narba* and *Phoobha* respectively, and both of them are Lamas. In Gyasumdo, two distinct clans inhabit—the Lamas (Gyasumdopa) and Gurungs, who are said to have migrated from Nyeshang. Gyasumdo means meeting place of three big villages—Tilche, Nachai and Tachai. Lobas from Mustang named Ghyasumda, the Nubribas from Manaslu area called Yalsum, and Gurung called Nasha Shon came to stay in Nyeshang valley long before its annexation to Nepal in late 1760s. Later, these villages were called *pashchim teen gaon* (three villages of the west). Various settlements that have emerged now because of the development of tourism and trade are the off-shoots of these villages. This district was an important centre for salt trade that came from Tibet across the passes of Gyala (5344m) and Larke la (5214m).

Fig. 2.1: Age structure of Manang's population (2001)



In 2001, there were only 9587 people living in 1776 households. As Manang is the least populated district, depopulation was visible since 1970s as hundreds of *Manangi* left the district for better opportunities in trade and other professions. But after 1990, the prospect for business within the district (mainly tourism) increased and they returned to tap these opportunities. Relatively young people dominate the population *(Fig. 2.1)*. During 1990s, population growth rate remained high in few VDCs like Manang, Chame, Dharapani and Bhraka. This could be the result of returning people after their out-migration in 1970s and 1980s.

Culture and cultural heritage

Local inhabitants of Manang use 'Gurung' as their surname but they are also popularly known as *Manangi*. However, local communities of Gyasumdo and Nyeshang valleys see themselves different from people of Nar and Phoo, and traditionally they refrain from inter-marriages between the people of two valleys.

Ethnically, Gurung (including Ghale), is the dominant group in Manang. Besides this, there are other inhabitants such as Lama (immigrants from Tibet but settled in Manang for two to three generations) and Bishwakarmas, but their numbers are insignificant. Culturally, the *Manangi* belong to the Tibetan sphere, and their language traces back from the Tibeto-Burman origin.

Sacred sites

- Pocho monastery (about 500 years old);
- Milerepa cave and monastery (11th century);
- Tara monastery;
- Ne cave;
- Karma Samten Chokkor Ling monastery; and
- Swarga Dwar (gateway to heaven).

The cultural renaissance that took place in Tibet from 11th century onwards introduced, among others, the Kargyupa Order into a mainly Bonpo and Nyingmapa milieu. During this period, Tibetan Buddhism in its Kargyupa form found its way to Manang valley. The Tashi Lakhag Gomba, located at Phoo village, is considered one of the most sacred monasteries for Buddhists, which is also the main Kargyupa monastery in the district. Besides Kargyupa, Nyingmapa and Sakyapa Orders of Tibetan Buddhism also have strong presence in Manang. As in Mustang, these different Orders of Tibetan Buddhism over the centuries have been blended so well that they can be hardly differentiated from one another.

The Karma Samten Chokkor Ling monastery runs a boarding school for young students who aspire to become monks. After completing few years of studies at this school, young monks are sent to Pokhara, Kathmandu or India for higher education. Most of the monks do not return to their monasteries after training and this has been a major issue, particularly to maintain the monasteries in Manang.

Manang still has very strong and effective traditional system of village governance, managing natural resources and maintaining cultural and social fabrics. Despite political changes, the traditional 'Khamba-Ngerba' or *Mukhiya* system is still in practice in most of the villages. The *Mukhiyas* are nominated for a period of five years and is supported by a council of 7-10 members. They are nominated on rotational basis and when their turn comes, even if they are living permanently in Kathmandu or Pokhara, return home to discharge their responsibilities. They oversee all major village events such as organizing festivals, resolving conflicts, maintaining accounts of the council, etc. For minor duties, the *Mukhiyas* and members of the council delegate responsibilities to their representatives in agreement with other residing council members.

Photo © NTNC

Outside Manang, *Manangi* have formed *Samajs* or committees. The *Manang Bikash Manch* (MBM), which has two members from each VDC, is based in Kathmandu and has strong influence and stake in the development issues of Manang. The organization has initiated extension of road construction from Chame to Khangsar. Similarly, the very influential *Manang Sewa Samiti* (MSS), also known

as *Ama Samuha*, is based in Kathmandu. The MSS has 7-11 members from each VDC and they are democratically elected for two years. The MSS is considered to be more influential than MBM in controlling Manang's affairs from Kathmandu. For example, MSS successfully banned tree felling recently in Ngawal for ten years. However, there is a growing sign of resistance from villages, which have strong local leadership against Kathmandu based organizations which is very much controlled by the so called elite *Manangi* who have political interests in the district.

Outsiders are not allowed to buy lands in Nyeshang, Nar and Phoo valleys. One has to have a house or register as 'Kuriya' to have access to forest and other natural resources. Many Bishwakarmas, whose ancestors settled in Manang at the invitation of local people, do not own agricultural lands as *Manangi* would not sell to them, but were allowed to have a house or included in *Kuriya*. This has given them equal right as the original inhabitants to have access to and use of natural resources. They are also included in committees or groups formed for resource conservation. However, they do not participate in village council or do not serve as village *Mukhiya* as the position is reserved only for the native *Manangi*.

Housing and settlements

There is variation in the style of houses as one moves from Lower to Upper Manang. In Lower Manang, which receives high rainfall, houses have sloping roofs, and are strongly built using stone and mud mortar. Areas above Chame have flat roofs and are built mainly with mud. However, new houses have been built in modern style with corrugated sheets and timber. The settlement pattern is compact but sparsely distributed along or nearby the Annapurna Circuit Trek (ACT). With the opening of road, building materials will become cheaper. Zinc sheets, iron bars and cements will be available and people will start to build modern buildings using these materials. The traditional style of architecture is likely to disapper as new houses are built.

Photo © NTNC

After road becomes operational, there will be a major change in settlement pattern. Passengers travelling by bus may not stop-over until they reach Chame. Roadside hotels and restaurants may not get

enough guests. There could be depopulation in roadside settlements. Moreover, road alignment does not pass through all the settlements located now along the trekking track. These settlements might shift to road sides. Although this could not be predicted owing to uncertainties of road alignment, it is likely that some settlements (Tal) will not be touched by road. On the other hand, settlements like Chame and Manang could grow exponentially. These settlements will attract people from smaller settlements.

2.4 Economic Context

Agriculture, horticulture and fresh vegetables

Farming and herding are still the main occupation of the people even though there are arguments about the lack of expansion in farming. Agriculturally suitable land is extremely limited[1]. About 1937ha land is cultivated, of which 778ha is irrigated and only 224ha has perennial irrigation. Middle class and poor people are mainly involved in farming potato, wheat, maize, buckwheat and barley. While apple, apricot, plum, walnut and pear are the main fruits, cabbage, cauliflower, bean, radish, mustard leaf, turnip, carrot, onion, and garlic are the primary vegetable crops. Vegetable is by far the most profitable crop. It is estimated that a hectare of vegetable production can generate an annual profit of Rs. 147,000 (excluding family labour and inputs). The profit per hectare of wheat is Rs. 22,610 and that of barley is Rs. 18,546.

Photo © Dr. Ram P. Chaudhary

Access to road network will help tap various opportunities existing in agricultural sector. Production, processing and storage of fresh vegetables, fruits, herbs and quality seeds can attract commercial markets. There is plenty of land to increase the scale of operation for the production of commercial products such as potatoes. Most of the barren land is owned privately. Labour charges are exceedingly high. In

1. According to DDC report published in 2002, total area of Manang is recorded as 224,600ha, of which 0.96% (2153ha) is cultivated area; 8.53% (19,166ha) is forest area; 2.18% (7174ha) is pasture; 82.95% (186,289ha) is hills and rocks; and 4.38% (9846ha) is shrubs. A study conducted by Himalayan Resources reveals that the total area of Manang is 2242sq.km, of which 0.02% (0.44sq.km) is fallow land; 0.48% (10.78sq.km) is agriculture; 67.78% (1919.6sq.km) is uncultivated land or rocks; 6.87% (154sq.km) is forest; 22.50% (504.43sq.km) is pasture; 0.17% (3.81sq.km) is water; and 2.18% (48.82sq.km) is shrub.

the absence of fencing, free grazing animals damage the cultivation of such herbs. Cultivation of herbs and vegetables could help improve livelihoods of agricultural households in the district.

Road connectivity could reinvigorate the declining agriculture. Agriculture has declined mainly because of the out-migration of people. A lot of land has either remained fallow or abandoned. This is especially so in Manang proper where 70% of the previously cultivated land has been left fallow. This could change with road connectivity, increased inflow of population and improved market connections for those crops in which Manang has comparative advantage.

Animal husbandry

Photo © Dr. Ram P. Chaudhary

Manang is one of the districts having highest density of livestock in the country. It is one of the main sources for livelihood, especially in areas away from the trekking route, and in higher altitude. The villagers of Nar and Phoo, for example, depend mainly on livestock. Lower Manang also derives significant income from breeding animals to produce Jhopas, which are sold in Manang. Cows, buffaloes, yaks, *chauris*, naks, jhopas, pigs, horses, mules, donkeys, poultry, goats, sheep and cats are major domestic animals found in the district. *Lulu* is a famous local breed of cow, which is known for high milk production and resistance power even in adverse climatic conditions.

Because of cold climate, there is high demand of animal products like wool, meat and ghee. But the supply has not been able to meet the demand as the production of fresh milk is very limited. The main problem for animal husbandry is the lack of fodder for winter when the animals are kept at home. There is no practice of growing fodder trees. In summer, animals are taken to high altitude for grazing. As pasture belongs to different villages, Rs. 10 is charged for grazing an animal for one season.

Industries, trade and non-farm enterprises

Manang district has only small industries like bakery. But there are possibilities of establishing good industries like herb processing, furniture and cheese factory. Road could bring the possibility for these industries. There are some traces of mica in the hilly slope near Thanchowk village. Similarly, presence of copper in hilly slope of Phu-kang and precious stone in Naje reflect some possibilities of copper and stone mines.

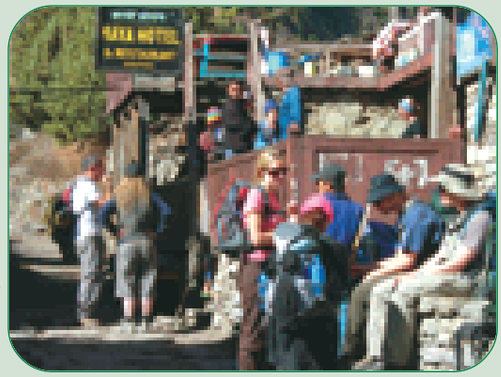


Photo © NTNC

Tourism

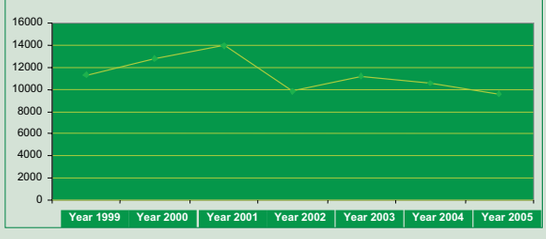
Manang was opened for tourism in1977. The opening of Manang offered an excellent opportunity to trek around the Annapurna range which has become famous as the Annapurna Circuit Trek (ACT). This circuit trek has been enlisted as one of the world's top trekking destinations. It takes approximately 21 days to complete ACT and Manang takes 9/10 days to complete the same. This section of the trek starts from Khudi village in Lamjung district and it takes about 6/7 days to reach Manang village. The majority of trekkers usually spend an extra day in Manang for acclimatization before trekking over Thorang La down to Muktinath in Mustang district. From Manang, it takes another 2/3 days trekking over the pass. There are other trekking destinations such as Nar, Phoo and Tilicho. However, only limited number of trekkers visit these areas.

Trekkers pay US$ 70 per week for special trekking permits to reach Nar, Phoo and Tilicho. The Nar-Phoo area was opened to trekkers only in 2002 and it takes nearly seven days to complete this trek which starts from Koto, a small settlement near Chame to Phoo and then to Nar and over the Khangri-La to Ngawal in Nyeshang valley. This area provides excellent view of mountains, pasturelands and two old settlements of Nar and Phoo, which are famous for interesting fortresses built in the Tibetan tradition. Similarly, the trek to Tilicho, the world's highest mountain lake, starts from Manang via Khangsar, the last permanent settlement. There is a pass over 5000m before descending Tilicho, which is situated at 4919m. It takes two days to get down to Jomsom via Tilicho after a difficult trek over another 5000m Mesakando Pass.

Besides trekking, Manang also offers a number of small peaks to amateur mountaineers. Pisang, Tilicho, Thorang and Khangri-la peaks are popular as trekking peaks amongst mountaineers. There is also a mountaineering school at Humde run by Himalayan Rescue Association. However, it is under-used and has been offering mountaineering courses of international standards only once every two years. The association has a resident volunteer doctor at Manang village who provides daily free talk programme on mountain sickness.

By 1980s, the number of trekkers grew at an annual rate of 6—8%, and reached 13,920 in 2001*(Fig. 2.2)*. However, because of deteriorating conflict situation, the number of trekkers declined to 9550 trekkers in 2006 (down by 8.8%) as compared to 2005. Although Manang was safe to trek, the area between Ngadi to Tal was considered sensitive during insurgency as Maoists were operating a check post at Jagat and collecting fee from trekkers visiting Manang. This may have had negative impacts on the movement of trekkers.

Fig. 2.2: Number of tourist arrivals in Manang



With the signing of the peace agreement since 2006, Manang is expecting an improved tourist flow. There is only one airstrip at Humde but flights are unreliable.

Tourism development in Manang has led to the proliferation of lodges and other tourism related enterprises. Places such as Tal, Danaque, Pisang and Manang have large number of lodges. Annual turnover of lodge is about Rs. 120-130 million. An average trekker spends Rs.1500 per day. Besides lodges, other enterprises such as bakeries, souvenir shops, inns *(bhattis)*, horse and yak rides, guide services, general stores and food supplies have also benefitted from tourism.

It is estimated that an average lodge provides employment to two people with the monthly salary varying from Rs. 3000 to Rs. 6000, including food and accommodation. Majority of lodge employees go home during winters for about four months. Manang has become a centre of attraction for workers from Gorkha, Lamjung and Dhading districts. Besides lodges, many inns are also catering to the needs of porters and junior trekking staff.

2.5 Development Context

Infrastructure (physical and social)

Manang district has almost all the different government institutions.

Airport: There is one airport at Humde two hours walk from Manang connecting Humde with Pokhara via Chame *(Map 3)*. This fair weather airport is mainly serving the sick and old people to go to Pokhara for treatment.

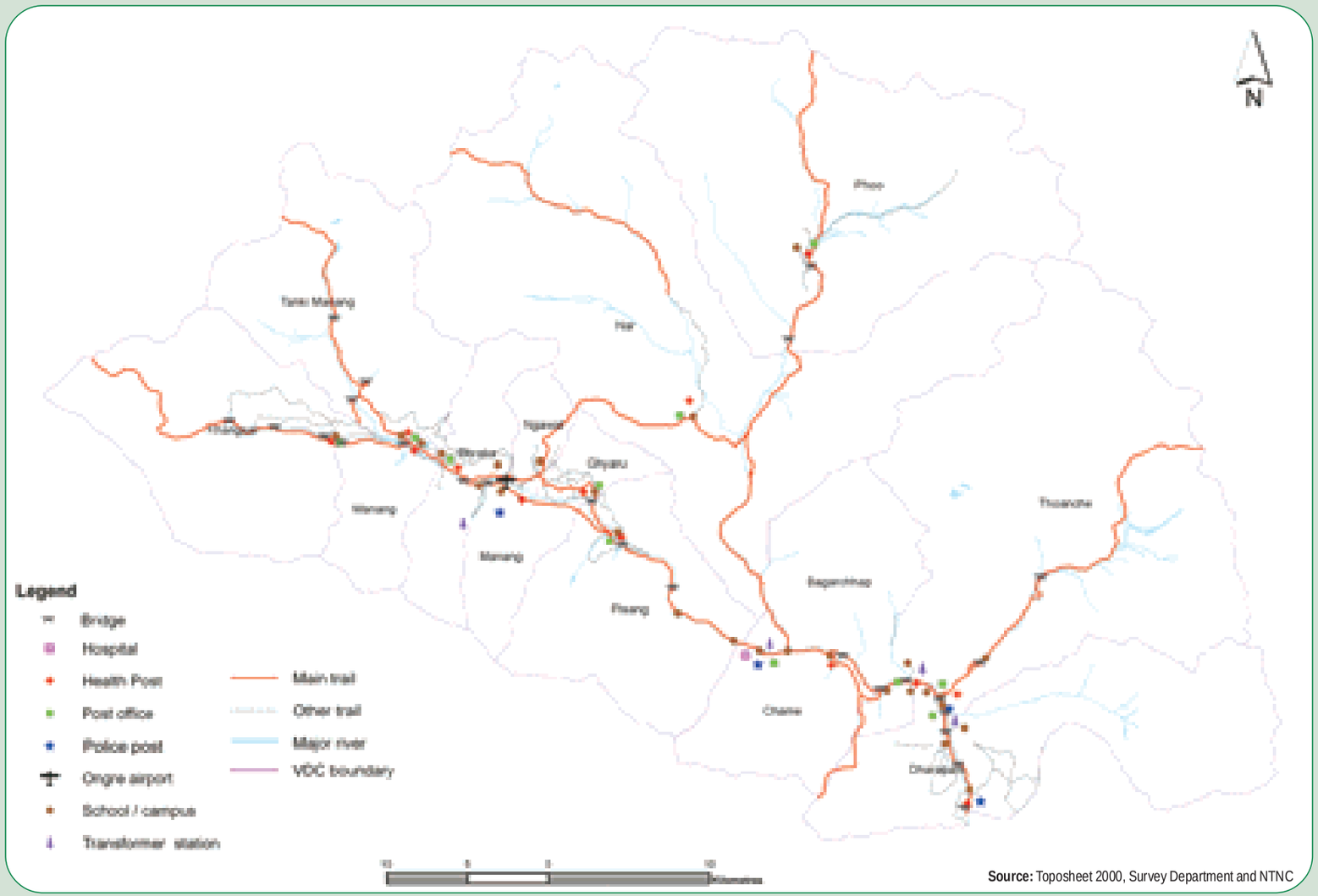
Electricity: Electricity service is insufficient and unreliable. Manang has high potential for micro hydro power generation from various rivers and springs. As of now, only 125kw of electricity has been generated by six micro hydro power stations. In Tal, an integrated management of spring water (Chhahare khola) exists, which is utilized to generate electricity, water supply and irrigation.

Water supply and sanitation: Manang has piped water supply in the community. Making water distribution system more reliable and managing waste water are important issues for future. There are toilets but very few have proper septic tanks.

Drainage and sewerage: Most of the settlements do not have drainage and sewerage facilities. This problem will be increased after the construction of road.

Solid waste collection and management: Although ACAP has adopted 4 Rs (Reuse, Reduce, Recycle and Right disposal), there is a problem of solid waste collection and management. Plastics and plastic bottles have posed disposal problems in the district.

Map 3: Infrastructure and services available in Manang district



Source: Toposheet 2000, Survey Department and NTNC

Traditional organizations: The Buddhist tradition has various practices supporting the poor and marginalized communities. The most discriminated people are *Dalits*.

Services (health and education)

One of the major issues of education is not the number of schools or teachers, but the quality of education. In 2001, there were 839 students in primary schools, 268 in secondary schools, 123 in high schools and 111 in higher secondary schools. Participation of girls is high in primary schools. Higher is the class, lower is the number of girl students *(Map 4)*. Wealthy people mostly send their children to Pokhara, Kathmandu and even India for education. Even poorer and middle class households have their children studying in Lama schools in Kathmandu, which are generally free.

Sanitation problems are widespread. Data collected reveal that only 36% households use toilets. Approximately, 64% households have no toilets. Manang has a hospital with 15 beds, 10 health posts and 3 sub-health posts. Absence of human resources coupled with lack of medicine and proper health care facilities are major health problems. After the opening of road, this problem may be resolved to some extent.

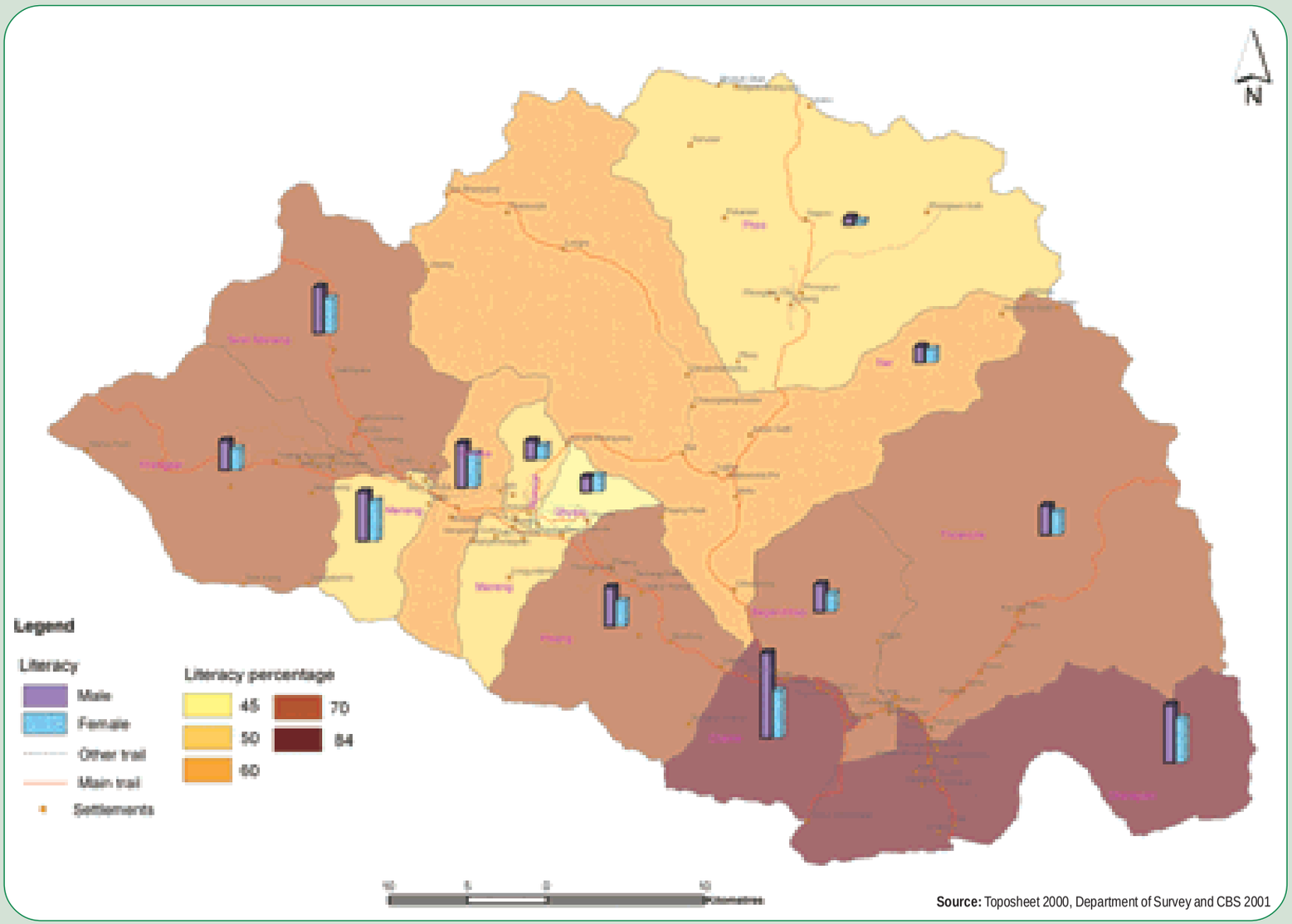
There is also shortage of revenue sources for increasing services in Manang. The resource collection was Rs. 0.5 million in 2005. This income was possible because of Local Self-Governance Act, which enables the district to levy various taxes and service fee. The district received Rs. 14 million for various development activities from donors.

Partnership development

Participation of private sector and civil society is growing as there are several NGOs working in the district. Similarly, women groups, user groups and special groups are also active. The NTNC/ACAP has formed the Conservation Area Management Committees (CAMCs) and various sub-committees in each VDC. Several religious institutions have played positive role in the conservation of resources.There are also duplications and conflicts in the authority of CAMCs and VDCs. In the past, most village and community level management was undertaken by local and traditional institutions such as *Mukhiya*. There were also traditional resource management systems, of which *Chumnam* system was common. This helped in regulating the movement of animals between the villages and pastures.

The DDC, *Ilakas*, VDCs and Ward Committees are responsible for managing Manang's state of affairs. The government, with the assistance of UNDP, has initiated a participatory district planning process, which starts from the VDC level. The DDC is the main coordinating body for development activities. The total district's annual budget is Rs. 103 million, a large part of which is spent in administrative expenses.

Map 4: Status of literacy (2001) in Manang district



Source: Toposheet 2000, Department of Survey and CBS 2001

CHAPTER 3

ROAD NETWORK

3.1 Current Status

Manang is one of the few remaining districts of Nepal that is not yet connected by road. In the past, this district was not prioritized for road development as it was assumed that trekking tourism, which has been popular here, would decline. But majority of local people were in favour of road. As the absence of road and physical exclusion are considered main causes of poverty and lack of human welfare, it is now considered that road connectivity is important. The National Transportation Policy has planned to link all the district headquarters by road so as to remove physical barriers to development. Access to market, economic opportunities and trade will flourish with the opening of road, which are considered instrumental in reducing poverty. Accordingly, the road linking Besishahar to Chame has become government's priority. This road will link the district headquarters to the national highway. Even as the activities for opening these roads at various places had started long back, it was inadequate from engineering point of view.

The Department of Road entrusted the Nepal Army to construct the road in 2002. The role of army personnel is to open the track according to the design of alignment prepared by the Department of Road. Only in few cases the alignment has been changed. The plan is to complete it in seven years with the estimated budget of Rs. 1.5 billion. The track is expected to be completed by 2009 with the road length of 35km in Lamjung section and 30km in Manang section (up to Chame only).

At present, the road has reached Khudi and it is expected to be motorable up to Syange. There is a 5km rocky area in Jagat and Chame sections. About 24km road has been opened and the work is underway for another 12km section, which is expected to be completed in two years. In total, Rs. 130 million has been spent for road construction. Although army has maintained compliance with environmental standards, it does not appear to have been strictly followed as debris is thrown into the river and trees have been felled indiscriminately.

Photo © NTNC

After opening of the track, the army will hand over the work to the Department of Road, which will

study the traffic flow and accordingly make decisions for black-topping. But given the environmental concerns, it has been emphasized that black-topping of high quality should be done immediately after the opening of the track.

3.2 Existing Impact of Road Construction

The existing road is not motorable yet. Transport facilities are now available only up to Khudi, which has shortened the journey by about one hour. Therefore, portering by people or by donkeys is still the main mode of transportation. Because of the lack of transportation facility, the cost of goods, commodities and services has remained extremely high.

Photo © NTNC

Road will bring far reaching consequences in all areas of life. People have started to increase areas under apple trees with the expectation that they can create marketing opportunities for vegetables, herbal farming and animal husbandry. Cropping pattern is expected to change as more people will be cultivating cash crops. The area under traditional crops and farming system might decline. The existing agrobiodiversity will decline as people will import improved seeds and only cash crops are likely to be grown. There will be changes in owning the types of domestic animals. The number of horses and donkeys will decline. On the other hand, number of cows, yaks, goats and sheep might increase.

Loss in biodiversity, bio-piracy and wildlife poaching has increased in recent times. Increased access to markets will enhance incentives for excessive harvesting and poaching. Positive developments in energy use, development of hydro power and increase in food security are positive impacts of road construction. As the availability of alternative fuel like kerosene and gas will increase, pressure on forest for fuel wood will decrease. Road is instrumental for hydro power development. Investors will be optimistic to develop hydro power once it is easily accessible. Similarly, agro-based and herb processing industries are likely to be established. People of Manang who are now living in Kathmandu and Pokhara and who have access to remittances are expected to invest in Manang. In fact, they are playing a catalytic role in the construction of road. However, one major threat after the construction of road could be the increase of sexually transmitted diseases and HIV/AIDS. With the increased flow of young people and tourists, this problem is also expected to increase.

The problem that has pre-occupied many people in Manang is the change in settlement patterns. Some settlements are expected to vanish as they are not linked to road. Similarly, settlements which lie in between the stops (bus and other vehicles) will

Road to reduce poverty

Road is also expected to reduce poverty and food insecurity. At present, large quantity of food is imported to meet food deficit in the district and the cost is very high. The cost of food is expected to be half after road construction. Similarly, people can receive medical treatment in Pokhara or Kathmandu. Increase in employment and income generating activities will benefit the poor even though some opportunities like portering will be reduced.

decline, if not disappear altogether. At present, it is seen that Lata Manang has completely dried up. On the other hand, settlements having a central location will expand exponentially and will give rise to problems that are similar to other urban areas. The problem of solid waste, haphazard settlement development, mushrooming of houses, sewage and dumping of wastes into river will feature as major problems. Some of these are already visible in Chame and Manang.

There are also changes in the price of land. This has increased in locations which are suitable for business opportunities. The price of land in Chame and Manang has increased sharply. As business opportunities will increase, more outsiders will come and buy land. Because of the increase in price, there is also a tendency to register common land in individual's name. As a result, common property is expected to disappear if measures are not taken to protect these resources.

Use of old and polluting vehicles will also pose a problem. Even though there are no vehicles (except a tractor) running in Manang, it is expected that they will start running once the track is opened. In the beginning, it is seen that only old and polluting vehicles run on rough roads. This will increase air pollution. Main settlements in Manang are located in a small river valley surrounded by tall mountains. This location makes Manang highly prone to air and other pollution.

Photo © NTNC

The construction of road is good for tourism as it will help to increase the number of tourists. For example, more Nepali, Indian, Japanese, family and religious tourists, and elderly people are expected to come after the construction of road. In the absence of road, only trekking tourism has been popular here. However, in recent years, there have been arguments that trekking tourism will gradually decline after the opening of road. These aspects need to be carefully monitored so that appropriate interventions can be made if tourism is in any way adversely affected.

Forest for timber

With road, the pressure on forest for timber will also increase. As timber can be transported easily and will fetch high price in urban areas, there will be a temptation to sell timber. On the other hand, the sustainable harvesting of forest and proper marketing of timber and NTFPs might help to increase the wealth at the community level. This community wealth can be used for social development and in helping the poor if proper institutional arrangements are made.

3.3 Overall impact on environment and society

The potential impacts of road (both positive and negative) on cross-cutting issues have been presented in *Table 3.1* linking issues with threats and opportunities. Owing to the lack of baseline data on various indicators of pollution and social development, it was difficult to calculate the impact and estimate the cost to mitigate its adverse impacts. Based on the general understanding of the place, *Tables 3.1, 3.2 and 3.3* have been developed to indicate the potential impacts of road in Manang district. Domestic air pollution is likely to increase unless checked. The impact of road will be generally negative on other types of air pollution as shown in *Table 3.2*. There are only a few areas in which road will not have direct impacts.

Road may not have high impact on biodiversity as the present road alignment passes through the same trekking route. Noise pollution could increase. Easy movement of unscrupulous agents (poachers, bio-pirates and smugglers) after road construction can have some adverse impacts. But road will also make surveillance easier and faster. In some critical areas, road construction should maintain certain standards like 'no horn area', 'under-passage for wildlife', so as to avoid disturbance to wildlife. Positive impacts could be noticed on environment as road will make other fuel alternatives to fuel wood cheaper. It is expected that people will opt for other fuels after road construction. Road will also facilitate hydro power development.

The overall impacts of road on social and human development will be positive. In most of the indicators, road will have positive impacts as shown in *Table 3.3*. Other impacts would be in trekking tourism and bringing other types of tourists like religious and family tourism. Given that road is expected to generate opportunities for social and economic development, including improving food security, it is obvious that people have given it a lot of importance.

Photo © Dr. Ram P. Chaudhary

3.4 Future Plan

The District Development Committee has planned to take the road from Chame to Manang and Khangsar. It seems that construction of road is easier owing to gently sloping land. Every year, VDCs donate half of their budget for road construction. Manang Development Society (MDS) is also responsible to monitor road.

Inaccessibility was found to adversely affect the poor and marginalized communities the most. Their accessibility to cheaper food and commodities and emergency medical treatment has been curtailed because of the lack of transportation facilities. The MDS organized all VDCs to work for road construction. In the section above Chame, MDS has planned to permit only light vehicles and build suspension bridges over the river. Tourism will not be disturbed by vehicles as these small vehicles would not significantly pollute the environment.

Table 3.1: Potential impacts of road

Issues	Negative impacts (threats)	Positive impacts (opportunities)
Livelihoods (agriculture, trade, industries, animal husbandry, mining)	• Wealth gap will increase • Traditional safety net will decline • Competition with outsiders will increase • Increase competition and decline of local industries • More pest and diseases for people, animals and crops • Loss of agrobiodiversity • Pressure to use more chemicals	• Trading opportunities will increase and income will rise • Food and other goods will become cheaper • Diversification in livelihood opportunities • Increase in cash crops (vegetables, fruits and herbs) • Dependence on food on other region/market will increase possible risk of food insecurity due to market failure • Opportunities to expand livestock farming, including dairy animals • Opportunities to reduce poverty by engaging poor in cash crop farming by increasing the access to land and natural resources • Increase in agro-processing industries • Making the poor people capable to deal with market, increase their marketable surplus • Industries having competitive advantage may increase • Primary product processing (fruit, vegetable, herbs) will increase
Biodiversity and forest	• Theft and poaching may increase • Bio-piracy may increase • Noise may cause disturbance to wildlife • Pressure on forest for timber and NTFPs may increase because of demand in towns and other places and temptation to earn more income • Invasive alien species may increase	• Market for herbs • New tourism products (wildlife sighting) • Human-wildlife conflict may decline • Community income increases through sustainable harvesting of forest • Improved technology can reduce the pressure of timber on forest • Materials from city may reduce the need for timber
Air, water, noise and soil pollution	• These pollutions will increase significantly • Solid waste problem will increase • Sewage problem and draining into river • Aquatic biodiversity will decline	• New mitigation technology development (river training, soil control and solid waste management)
Population and settlement	• In-migration and transit population will increase • Erosion in traditional values • Loss of traditional architectural style • Theft of cultural artefacts will increase • Pollution may damage places of culturally important artefacts • Fast urbanization of few locations • Decline of some settlements • Loss of traditional architecture • Loss of public lands	• Return migration of local people • Investment of their income and remittances • More remittances will lead to more investment • Incentives for preservation of cultural artefacts, if linked to tourism and livelihoods of people • Return of local people means revival of community life
Energy	• Encourage fire wood harvesting	• Opportunities to generate more clean energy will increase (hydro power) • Pressure for fuel wood will be reduced • Alternative energy will be cheaper
Tourism	• Decline in trekking tourism if alternative trekking routes are not developed and popularized • Duration of stay may decline	• Domestic and other types of tourism will increase (religious, educational, etc.) • Number of total tourists could increase • Year-round tourism may flourish
Services	**Health:** • New diseases due to pollution and urbanization • Risks of HIV/AIDS may grow • Traditional medicinal practices may decline **Education:** • Out-migration of students to main city will increase **Institutions:** • Importance of traditional institutions will decline	• Access to health services will increase • Health professionals stay in the district • Emergency medical care is possible • Access to school/books will increase • Teachers will stay in the district • Quality of education will improve • Investment in educational institutions will increase • Coordination and cooperation will be easy because of access to each other and increased communication • More interactions between local and district level is possible

Table 3.2: Existing level of various types of environmental pollution in Manang (2007)

Type	Existing pollution level			Impact of road
	Non-existing	Within the national standard	Exceeding the national standard	
Air				
• Total Solid Particles (TSP)				negative
• PM^{10} (Particulate matter)				negative
• Sulpherdioxide				negative
• Nitrogendioxide				negative
• Lead				negative
• Carbon mono-oxide (indoor pollution)				positive (decrease)
• Benzine				negative
• Carbon dioxide (indoor pollution)				positive (decrease)
Water				
• Suspended matter				negative
• Dissolved solid				negative
• Heavy metals				negative
• Total hardness				
• BOD				
• COD				
• Coliform bacteria				
• Arsenic				
• Harmful chemicals				negative
• p^H				negative
Land				
• Bio-degradable materials				
• Chemicals				negative
• Soil P^H				negative
• Heavy metals				negative
• Construction materials				negative
• Plastics/glass/metals				negative
• Infectious/contagious materials				negative
Others				
• Noise (decibels)				negative
• Heat				negative
• Vibration				negative

Table 3.3: Impact of road on social development and environment conservation

	Impact of road		
	Positive	No impact	Negative
Energy use			
• Fire wood	decrease		
• Renewable clean (hydro)	increase		
• Renewable clean (others)	increase		
• Non-renewable but modern (kerosene, LPG)	increase		
Education			
• Access	increase		
• Quality	increase		
• Literacy	increase		
• Girl education	increase		
Health			
• HIV/AIDS and STDs			increase
• Tuberculosis			increase
• Hepatitis			increase
• Acute Respiratory Illness (indoor pollution)	decrease		
• Acute Respiratory Illness (outdoor pollution)			increase
• Access to health services	increase		
Food Security			
• Food production	increase		
• Food availability	increase		
• Access to food	increase		
• Local food culture			destorted
• Vulnerability	decrease		
Economy			
• In-migration		increase	
• Out-migration		increase	
• Prices of goods and services	decrease		
Tourism			
• Tourism (trekking tourism)			decrease
• Religious tourism	increase		
• Other tourism	increase		
Crime			increase
Gender equality	increase		
Social equality	increase		

CHAPTER 4

EMERGING TRENDS AND ISSUES

Photo © NTNC

Based on the consultations with stakeholders and secondary information about Manang district, the following important trends and issues were identified for sustainable development and environment conservation of the district.

4.1 Livelihood Diversification

Manang is a sparsely populated district. Frosty and long winter makes it difficult to grow crops all the year round *(Table 12)*. Availability of cultivable land is also limited. Crops are grown only in one season in Upper Manang. Most of the lands in this area are used to grow vegetables. Apples are popular fruits but their quality is poor and has a limited market. Eight VDCs above Chame have a joint apple farm at Brathang which is now leased to a family who pays Rs. 120,000 annually to these VDCs. The family runs a lodge which appears to be more profitable than farm. Quality of apple can be improved through the expansion of road network as it enhances market potentiality. The District Horticulture Office, however, maintains that apples of Manang cannot compete with apples from Mustang as they are poor in colour, size and taste due to inadequate sunshine, particularly in the lowlands of Manang.

Photo © NTNC

Yaks are popular mainly in Nar and Phoo areas, which have large rangelands. On an average, a household owns 20-30 yaks. There is a high demand for yak butter, particularly from *Manangi* who live in cities. With the current shortage of labour, care for animals has inevitably decreased. In the past, Tibetan refugees were available to work as herdsmen. But they were driven out from the district in 1975, severely affecting high altitude pastoralism already under strain.

Additionally, horses are also popular in Manang. Horses are the pride of wealthy families and are considered indispensable for quick and easy communication between villages in the relatively flat upper valley. Horses are used to carry tourists/trekkers, particularly over the Thorang Pass during bad weather at a cost of Rs. 7000—8000 for a day's journey.

Photo © NTNC

Manangi are known for their daring skills in a long distance trade. Unlike their counterparts from Mustang, trade has brought increased mobility for the majority of *Manangi* as it is an important activity for their livelihoods. In the past, *Manangi* used to travel to Meghalaya and Assam of North East India, and further ventured up to Myanmar, Thailand, Malaya and Singapore. They were known for trading precious and semi-precious stones such as gems, jades, pearls, rings, etc., and also food items such as rice and dried fish.

Long distance trade has changed local subsistence economy into cash economy and contributed to economic differentiation in the district. Even today, there are some households in Manang surviving at a mere subsistence level. Few people have succeeded in small scale trade and still depend on agriculture, pastoralism and collection of NTFPs and MAPs.

Despite abundant availability of valuable NTFPs and MAPs, people could be more involved in its trade to supplement their income. NTFP cultivation is four to five times profitable than traditional crops. There are no processing plants for value addition, and management system for sustainable NTFP harvest is completely lacking. The development of road network could pose threats to the sustainable harvesting of *yarsagumba*.

Manang's migration

Migration has long been a feature of population dynamics of Manang. Recent estimates indicate that out-migration is increasingly helping generate remittances. The 2001 census reveals that 189 people (135 male and 54 female) migrated abroad. But in reality, more people have migrated to foreign countries from every community. For example, 10 people from Tal, 5 people from Bagarchhap (20 households), 20—25 people from Dharapani, 13 people from Thanchok, 20—25 people from Pisang and 14 people from Nar were found to have migrated abroad, mainly USA and Europe. The remittance, however, does not directly come to the district but remains in cities like Kathmandu and Pokhara.

In-migration has also been growing. The 2001 census has revealed that 1217 residents in Manang were born outside the district and 27 were born in foreign countries. In-migrants have mainly come from Gorkha and Lamjung districts who reside in houses left by *Manangi* taking care of their property. In some cases, people from Gorkha have become permanent settlers through marital arrangements.

Relatively wealthy *Manangi* own hotels, possess agricultural land and livestock more than they can cultivate and domesticate. They send their children to schools in Kathmandu or Darjeeling (India), and own or rent house in Kathmandu or Pokhara. Rich *Manangi* permanently reside in Kathmandu and have successful ventures. However, they have kept their property in Manang mostly under the care of people who have migrated mostly from Gorkha and even from Dolpo. These people have long-term business and political interests in the district. After road construction, these people are expected to fully exploit the economic potential of Manang.

4.2 Poverty and Food Security

Manang has been rated as the second richest district in terms of per capita income. But a survey conducted by the DDC in 2005 reveals that a large percentage (60–75%) of poorer households exist in the district. The village which has less poverty is Nar where there is not much difference between a wealthy and a poor household. About 32% households (571) have less than 0.2ha land, which means they are very poor. About 60% households (1073) who have land holding between 0.2ha to 1ha are considered poor, and 134 HHs (7%) possess more than 1ha land, and are considered better-off.

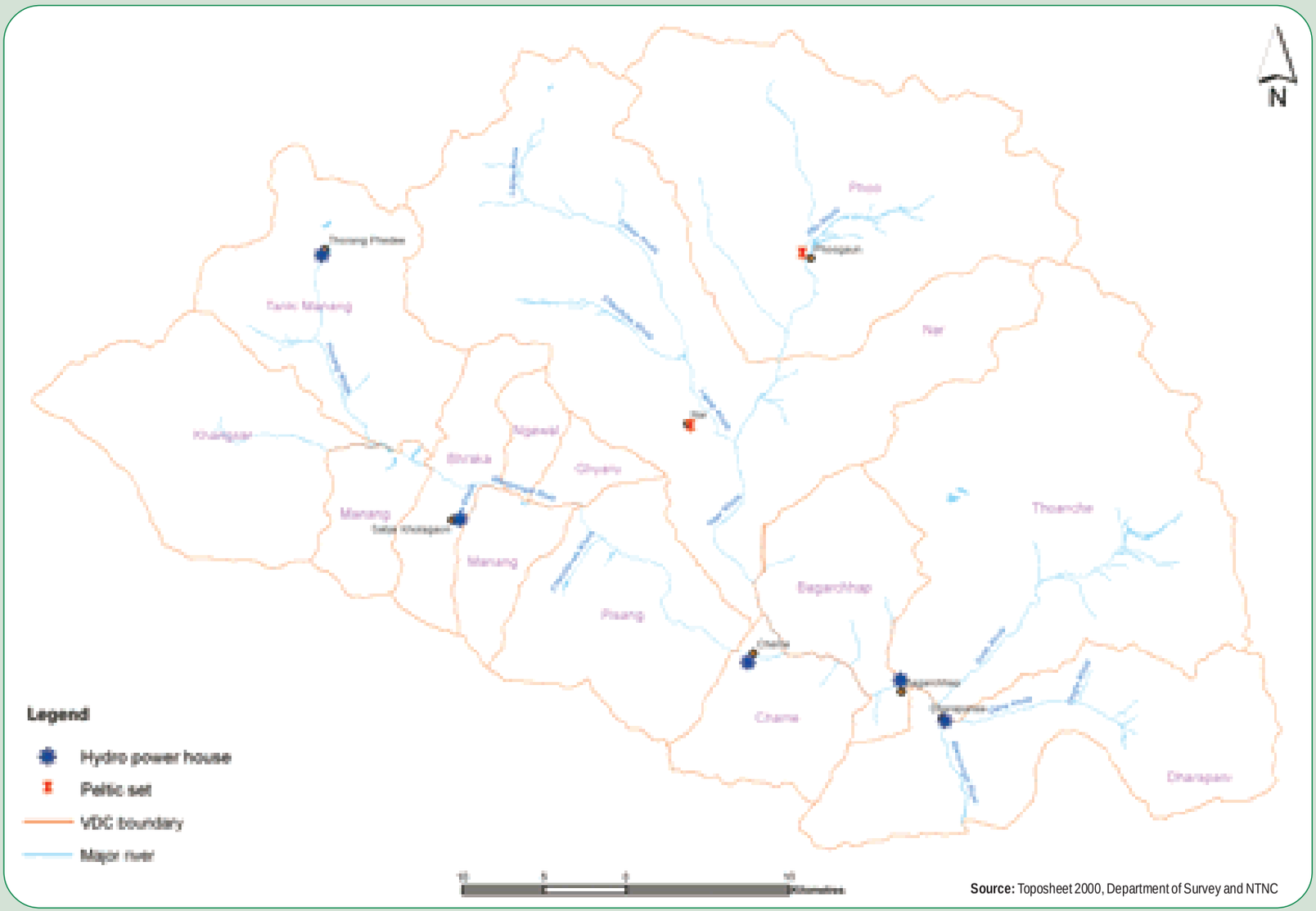
Manang is a food deficit district. The demand of food to meet the minimum food requirement is 1028 metric ton, of which 555 metric ton is deficit (54%). About 53% people are income-poor and 5% households are landless, thus forcing them to purchase food throughout the year. While 23% households can meet food supply for only up to 3 months, 35% households can meet the same for 3-6 months. In Thanchock, about 50% houses are below poverty line. About 40% households produce food sufficient only for three months, and only 10% households are self-sufficient in food production.

Like many other mountainous areas (including trans-Himalaya), Manang has been dependent on external market for food security. Long distance salt trade and practice of transhumance combined with trade were built around the need for food security. These helped in obtaining food from lowlands during winter season. Due to the unavailability of animal and difficulty of living in Manang during winters, people had to resort to winter migration with animals.

Photo © NTNC

With extreme climatic conditions and lack of productive land, food will continue to be imported to Manang. For this, road network will certainly facilitate. But given that road is lacking in many areas, a system of stocking food is important for uninterrupted distribution in the entire district. It is also important that other income generating

Map 5: Energy consumption in Manang district



activities are develolped for poor people so that they are able to buy food. Emphasis, however, should be on guaranteeing food availability in the market and increasing the exchange entitlement to food for the poor and marginalized communities.

Dalits, Disadvantaged and Oppressed

Of the total 1776 families in the district, 35 families are *Dalits (*mainly *Damais* and *Kamis)* who are concentrated in Lower Manang. Of these, 14 families do not have house and land, and the rest have land which is less than ten *ropanis* (0.5 ha). Average family size of these people is 5.3. *Dalit* students of 6-15 years go to school but their drop-out rate is extremely high. They can support only 2—3 months' food security from their own land. At present, they have the opportunity to cultivate land left by absentee household, but they have to pay a share of production or some rent. Literacy rate for those above 16 years is only 45.5%. *Dalits* are mainly Hindus, but those settled in Upper Manang are called 'Dhara', who are Buddhists.

4.3 Energy

Manang has many rivers and water falls that can be harnessed for hydro power generation. After the construction of road, many private companies are expected to compete for the construction of hydro power. At present, small hydro power projects exist such as Sabje Khola (80kw), which supplies electricity in six VDCs of Upper Manang. A 45kw micro hydro power is located in Chame khola. Others are at Bagarchhap (25kw), Dharapani (10kw), Nar, and peltic set in Phoo, Thock and a 5kw hydro power in Thorang Phedi *(Map 5)*. The ACAP has been promoting alternative energy technology such as back-boiler, solar water heating and improved cooking stoves.

Despite the connection of Manang through electrification, local people still depend heavily on fuel wood for cooking and heating purposes. The use of alternative fuels such as kerosene is minimal and use of liquified petroleum gas is virtually non-existent. Open traditional hearths are still in use and a large quantity of fuel wood is consumed every year. It is estimated that a local household uses around 40kg of fuel wood every day. However, forest above Brathang has improved over the years. Firstly, use of saws have reduced felling of tender trees by almost 70%. Secondly, VDCs and village committees in Nyeshang valley have imposed ban on felling green trees for ten years in their respective villages. This ban has also discouraged building new lodges in this valley. Ordinary households, however, can get timber from forests for repair and maintenance as decided by the committees.

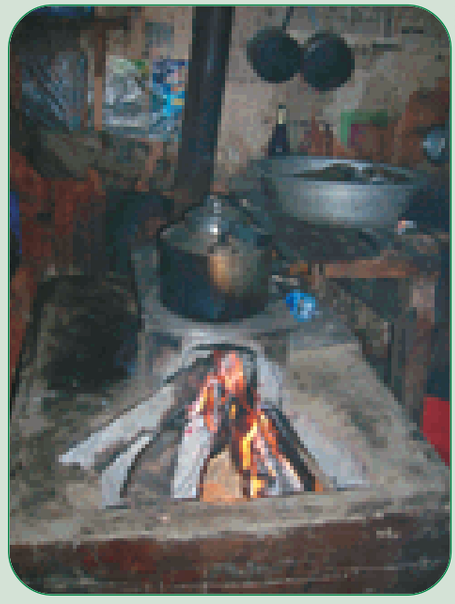


Photo © NTNC

4.4 Climate Change

Climate change has now become a real issue and Nepal is one of the most vulnerable countries to this change. Within Nepal, the trans-Himalayan region is seen to be directly affected. Yet the level of understanding and awareness on the issue is very limited. Field observations and the experiences of the elderly people clearly indicate that climate change is taking place and general warmness is increasing.

Photo © NTNC

In Manang, global warming was seen to impact glaciers. For example, only Gangapurna glacier existed until 1972. Now the lake is growing and expanding and the glacial moraine dam is not strong. Until a few years ago, glacier was seen touching the lake water. But now glacier has receded even further. Local people estimate that the lake will not survive even 15 years. There is also a 4km long glacial lake in Phoo, which is also growing. The Braga glacier, a small cirque glacier of only 1 sq.km (between 3800-3900masl to 4600masl), and having no proper reservoir or accumulation area, gives an average frontal 'retreat' rate of 30m/year (Vetaas 2007).

In Tal, people maintain that they have witnessed noticeable changes in weather patterns in the form of hailstorm, which completely destroyed potatoes in 2007. Earlier, Manang used to receive snowfall five to six times a year, mostly in lower hills, even up to Bahundanda. But in recent years, Tal has been receiving snowfall only once or twice a year, which immediately melts once it falls on the ground. There has been an invasion of mosquitoes up to Dharapani . The reasons are unknown, but it is linked with the rise in temperature and use of mules.

Impact on water resources: Less snowfall has resulted in less water in channels that pass to the settlements. Accordingly, the area under cultivation has also declined and irrigation has become one of the biggest problems.

Impact of natural hazards: Elderly people believe that weather induced hazards such as large avalanches, windstorms and hailstorms are increasingly common. Death of animals from ice fall has increased. It is now considered as the main problem for livestock raising in Nar, Phoo and other high altitude areas.

Impact on agriculture: There has been a shift of apple farming and other crops as it can be cultivated even at higher altitudes. Incidence of disease has also increased. New crops have been introduced, which could be due to new knowledge, technology or climate change. Shifting nature of crops makes it unprofitable to grow crops or trees that have long gestation period.

4.5 Biodiversity Loss

Photo © NTNC

The existing biodiversity has been rapidly threatened due to wildlife poaching, illegal hunting, collection of NTFPs, over-exploitation of forest and rangeland products, fire, wildlife depredation, natural calamity and inadequate alternative energy sources. Caps made up of the fur of red fox, beach marten, leopard cat, Himalayan weasel and other wildlife are openly sold in the district.

Uncontrolled collection of timber, fodder, fuel wood, medicinal plants and livestock grazing by local people have negatively impacted local forests and rangeland biodiversity. Deliberate and incidental forest and alpine grassland fire also occur in the area. Hunting in Lower Manang still occurs to control problematic animals, especially wildlife responsible for crops and livestock depredation. Traditional knowledge on ethnobotany and ethnomedicine has been eroding as new generation is least interested in its preservation.

4.6 Vulnerability

The incidence of natural disasters have been reported. These may be due to climate change, unsustainable land use practices, or increased pressure on forest. Tal, Dharapani and Bagarchhap are vulnerable to the floods of Marsyangdi river. With the opening of road and dumping of debris on road heads, various settlements are at risk. A small change in river course will destroy settlements. The flash floods of 1985 and 1986 in Bagarchhap destroyed 30 houses killing 20 people, including 9 tourists. Vulnerability is so high that two days of incessant rain forces people to migrate downstream. Even though information about risks associated with GLOF is not available, there is also possibility of floods and other risks associated with GLOF. Ice fall is more prominent in areas above Chame, Pisang, Nar and Phoo, which has killed hundreds of domestic and wild animals.

Photo © NTNC

Many forests have been destroyed by fire set either by villagers to improve forage or by reckless trekking groups. Pisang and Lower Manang have recorded high incidence of forest fires. Risk of forest fire is more common during road construction.

IAS in Manang

Invasive Alien Species (IAS) are major threats to the ecosystem, habitat and native species.They are considered second greatest threat to biodiversity globally (after habitat destruction and degradation). Invasive species spread very rapidly, are difficult to eradicate, often lead to irreversible species extinction, and are likely to cause economic and environmental loss.

Manang is an environmentally sensitive area. Road seems to act as a functional corridor for quick dispersal of invasive species. The problem of encroachment by IAS is growing with severity in different parts of Nepal, in particular lowlands and midlands. Therefore, IAS should be carefully managed and monitored in Manang.

4.7 Urbanization

Manang is not urbanized as all the settlements are predominantly rural in nature. Some issues related to urbanization are:

- **Sparse settlements:** Settlements are compact and sparsely distributed, which has created difficulty in planning, distribution and providing infrastructural facilities. As a result, large investment is needed to serve less people.
- **Out-migration:** During 1960s, 1970s and 1980s, out-migration was intense leading to depopulation in the district. If the same trend continues, some settlements will start disappearing and local characteristics and heritage will be lost. Now, in-migration is growing from neighbouring districts, and this will continue to grow after the opening of road. Accordingly, population growth will be intensified, and this will require more attention in urban management.
- **Land holding features:** People who had migrated from Manang still own land and houses in Manang. Many land holdings and houses are either not rented or are lying vacant. After the construction of road, it is expected that these absentee landlords or house owners will return to their homeland.
- **Change in housing patterns:** Newly built houses are using imported building materials. Even some buildings have used concrete floors and grills. This trend may damage local characteristics of housing and settlement.
- **Land use planning:** The flow of visitors to Manang is increasing. After the construction of road, the flow of people will increase. If land use and settlements are not properly planned, it is suspected that there will be a growth of haphazard settlements, which will create difficulties in urban planning.
- **Demand for facilities:** Physical and social facilities are lacking in many parts of Manang. With urbanization, new facilities are required to meet the demand of people like recreational facilities, security, etc. Basic services like reliable water supply and sewerage, electricity and telephone should be made available.

CHAPTER 5

SUSTAINABLE DEVELOPMENT FRAMEWORK

5.1 Introduction

Sustainable development means mainstreaming environmental and conservation values and concerns into the developmental (planning) processes. This mainstreaming will be achieved through the following processes:

- developing institutional mechanism at different levels (wards, villages—VDCs, *Ilakas* and district) to look after environmental concerns in the planning of development projects or any intervention;
- developing information or data base on environmental status, including the quality of environment;
- monitoring of the development achievements and feeding back the ideas and concerns to the planning process;
- developing capacity (including legal regulations) of different agencies in sustainable development planning, implementation and monitoring; and
- ensuring adequate incentives to promote sustainable activities and disincentives for unsustainable and environmentally polluting and damaging activities.

This mainstreaming is considered important for balancing development and environmental conservation for Manang district, which is being connected to external world by road.

The concept of sustainable development was initiated by the Brundtland Commission Report (1987). The report had defined sustainable development as 'development which meets the needs of the present without compromising the ability of future generation to meet their own needs'. In order to achieve this, social, economic and environmental objectives are to be made complementary and inter-dependent in the development process. Accordingly, any plan or strategy should integrate these three pillars of sustainable development—social (poverty alleviation and employment generation); economic (macro-micro level economic policies, and private sector activities); and environmental (brown and green issues). In areas where this integration is not possible, trade-off between them is also necessary. UNESCO in 2001 elaborated the concept of sustainable development further by adding a new pillar 'cultural diversity'.

In 1992, the Earth Summit endorsed Agenda 21 setting the milestone in promoting sustainable development principles. Eight years later, the Millennium Summit reaffirmed these commitments and redoubled efforts to make sustainable development a reality

through the declaration of the Millennium Development Goals (MDGs). The central theme of MDG is poverty reduction on a sustainable basis. The MDG has eight goals to be achieved by 2015. Goal 7 is directly linked to ensuring environmental sustainability. Targets are set for each MDG and are to be monitored through 48 indicators.

As MDGs are benchmarks of development progress, it gives people the power to claim their fundamental human rights, including right to food, education, shelter, health, live in healthy environment; and allow all citizens to become active advocates for development. The Government of Nepal endorsed MDGs, set numerical targets for each goal, and has committed to achieve it by 2015. The SDP has been developed to reaffirm Nepal's commitment to reducing poverty and advancing human development for the people of Manang district.

In most of the indicators, Manang's MDG status seems to be much higher than the national average as shown in the annex *(Table 1)*. The district level data shows that over half of the population is under poverty line. On the other hand, food security status of the district seems very marginal as compared to the national status. In contrast to the national level, Manang ranks fairly well as compared to other districts of the country. But planning for Manang needs to consider the intra-district (between geographical region and socio-economic groups) disparity and differences. Nepal started integrating sustainable development principles in its national plans, policies and strategies during the 8th 5-year Plan (1992-1997) and continued upto 10th Plan. Previously, Nepal had formulated National Conservation Strategy in 1987.

Mountain environment presents special challenges for sustainable development. This has also been the issue of Agenda 21 and the mountain chapter 'managing fragile ecosystems—mountain sustainable development'. This shows the general concern of policy makers for mountain environment. Mountains are considered as water towers for an increasingly thirsty planet, vast resources of cultural and biological diversity, sensitive indicators of climate and environmental change, vital recreational areas for an ever more urbanized world population, sacred places for religion and culture, and uniquely privileged regions of protected areas, but also sites of erosion, risk and disaster with damaging effects on the surrounding lowlands. Over 50% of humanity depends, in one way or another, directly and indirectly, on mountain resources[2]. This plan has also been made for a district which is located in the high mountain region, and hence, should receive attention from not only local/national agencies but also from global agencies.

2. Messerli, Burno. 2006. 'Keynote Address—Securing Sustainable Livelihoods in the Hindu Kush-Himalayas: Directions for future Research, Development and Cooperation. In: *ICIMOD 2006. Securing Sustainable Livelihoods in the Hindu Kush-Himalayas: Directions for future Research, Development and Cooperation.* P. 12-26.

5.2 Sustainable Development: Current Policy Context

Poverty Reduction Strategy Paper

Nepal's Poverty Reduction Strategy Paper (2002—2007) and the Three Year Interim Plan (2007/08—2009/10) give main emphasis to poverty reduction. In Nepal, environment/poverty linkages across many sectors are well recognized as income in rural areas is mainly based on natural resources, whether it is agriculture or tourism or pastoralism. Their degradation, therefore, are main source of vulnerability for rural poor. In designing and carrying out its poverty reduction strategy, the Tenth Plan has adopted a number of new approaches and initiatives, which represent a significant departure from past plans and strategies. One of them is to improve the accessibility of the districts by, at least, linking the district headquarters to road network.

Three Year Interim Plan

Photo © NTNC

The Three Year Interim Plan has set the goal of reducing poverty, increasing employment and making people feel perceptible positive changes. The vision of this plan is to build a prosperous, modern and just Nepal that is self-sustaining and free from absolute poverty level. For the attainment of this vision, the plan has adopted strategies such as giving emphasis to relief, rehabilitation and reintegration; achieving pro-poor and sustainable economic growth rate; increasing investments in physical infrastructure; carrying out inclusive development and targeted development programmes; and emphasizing social development, which will make people feel improvements in governance. Private and cooperative sectors will have important roles in the overall economic activities of the country whereas investments from the government sector will be directed mainly to relief, rehabilitation and reconstruction, development of physical infrastructure, and poverty alleviation. The Interim Plan has a clear objective that ten of the remaining district headquarters of the country will be connected by road by the end of 2010. One of these ten districts is Manang.

5.3 Cross-cutting Policies

5.3.1 Road for development

The objective of PRSP is to develop and manage a cost effective transport network for economic development. By expanding road network, the goal is to improve access to rural areas and market sectors, and enhance management of existing assets.

Focus of road connectivity

After the construction of road in Manang, the policy implementation should focus on major challenges, including: (i) maintenance of natural forest along road sides; (ii) ensuring benefits to local, poor and socially excluded communities from tourism and natural resources; (iii) design vehicular standards and effectively implement to control air pollution; (iv) create enabling environment for local communities on employment generation; and (v) involve communities in implementing rules and regulations.

The Department of Road is required to plant trees on both sides of the road and maintain vegetation (Public Roads Act 1974, Road Board 2001) at road use stage. Protection of roadside environment can best be achieved by developing and implementing environmental and monitoring guidelines and by giving overall management responsibility jointly to the respective VDC/municipality, DDC and NTNC. The feeder roads in Manang need to be maintained as 'green road' which is based on conservation-oriented techniques and participatory approach.

5.3.2 Empowering women and disadvantaged groups

Development outcomes in the past have varied inadequately, manifesting themselves in gender, caste, ethnic and geographic disparities. The People's Movement in the past (1990, 2005) raised the aspirations of marginalized sections of Nepal's population, but could not adequately deliver required services.

Without radical shift in current policies and resource allocation, Nepal will not be able to sustain the progress it has made to date. Therefore, empowerment strategies and plans of action need to focus on marginalized and disadvantaged groups, in particular women, given their key role in all kinds of socio-economic, cultural and religious activities, including agricultural and non-agricultural sectors for sustainable development. This requires women's empowerment through awareness raising, capacity building, guaranteeing basic and higher education, improving health and sanitation, economic advancement, and meaningful participation in decision-making processes.

Photo © NTNC

As in other parts of Nepal, women in Manang bear triple work responsibilities such as reproduction, agricultural household work and income generation activities through tourism. Work burden of women is highest (over 16 hours) during sowing and harvesting seasons, which also coincides with peak tourism season. Legal and social reforms need to be taken to adopt policy of mainstreaming gender to

promote equity and equality. Special package programmes need to be adopted in the areas of education for enrollment of girls, health education and sanitation, access to resources (in particular land and other property), and control over them, and representation in various decision-making levels.

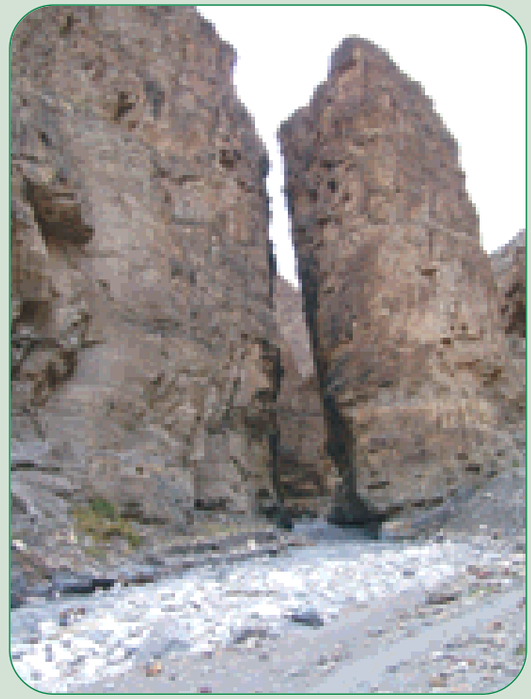


Photo © Dr. Ram P. Chaudhary

5.3.3 Water resource management

The government has adopted an Integrated Water Resources Management (IWRM) plan in 2002. This is based on the use of water from a holistic perspective, both in natural state and in balancing the competing demands on it such as domestic, agriculture, hydro power, industrial, cultural and environmental. Water resource development aims to contribute to improving the quality of life by: (i) reducing incidence of poverty; (ii) providing people with access to safe and adequate drinking water and sanitation to ensure health security; (iii) increasing agricultural production and productivity to ensure food security; (iv) generating hydro power to meet national energy requirements; and (v) protecting the environment and conserving the biodiversity of natural habitats.

Relevant policy principles mentioned in the National Water Plan (NWP 2005) are also useful for Manang, and these include:

- Developing and managing water resources in a holistic manner, relying on the principle of IWRM;
- Utilizing water sustainably to ensure conservation of resource and protection of the environment;
- Delivering water services in a decentralized manner by involving accountable stakeholders and agencies (public, private, community and user based organizations);
- Adopting best existing technologies and practices in micro-hydro power generation suitable at the local level; and
- Sharing of water resources benefits among the communities on equitable basis.

5.3.4 Food security, agriculture and animal husbandry

Food security comprises access to all people at all times for enough food to lead an active and healthy life. Therefore, food security must be viewed in terms of availability (production of food), access (economic and social), and utilization (proper processing of food items into food). This requires increasing the income of poor and small farmers

through employment creation from agricultural growth and intensification of small farms with high value crops, empowering the poor and needy, particularly women. Given massive food deficit in Manang in terms of the prevalence rate *(Table 3)*, priority should be given to address the root causes of food insecurity. The existing plans and policies aim to achieve this goal.

Agriculture Perspective Plan (1995): This 20-year plan for agricultural development emphasizes the need to intensify agricultural activities for poverty reduction through sustainable utilization of genetic resources for food and agriculture. It envisages the diversification and commercialization of agriculture by enhancing the production of fruits, high value crops, including NTFPs and livestock, in hilly and mountain regions. It is a prioritized plan of action in which a small number of key priorities is carefully packaged together into a Prioritized Productivity Package (PPP). The plan has put limited inputs in irrigation, seed, rural roads, electricity, fertilizer and appropriate technology at the national level in general. Budget in agricultural sector for Manang is extremely low. Emphasis should be given to encourage, use and maintain the current practice of using organic fertilizers. If not all, at least Upper Manang is using organic fertilizer, and forest resources and animal husbandry play a key role to fulfilling the needs of fertilizers.

Photo © Dr. Ram P. Chaudhary

Agriculture Policy (2004): The policy emphasizes to increase agricultural production and productivity so as to compete regionally and globally to strengthen conservation of natural resources, environment and biodiversity for sustainable use. The policy aims to: (i) support to reduce poverty by transferring degraded forests and unused public land to target community for planting fodder trees, forage grass, medicinal herbs and sericulture trees on leasehold basis; (ii) mitigate negative impacts of usage of agricultural chemicals on soil and wetlands; (iii) promote production and usage of compost fertilizer; (iv) manage gene bank and promote *in-situ* conservation; and (v) develop participatory conservation-oriented agriculture systems for the management of watershed and river banks. For Manang, emphasis should be given to increase 'niche' agricultural products and take competitive advantage in the perspectives of road development.

Tourism Master Plan (1972): Nepal has always remained a popular tourism destination due to its natural beauty, unique culture and incredible heritage. A ten-year tourism

master plan was prepared (amended in 1984) in 1972 aimed at providing a clear direction on policy reform and development work. Apart from these, a number of working plans targeting special issues were also implemented, notably "Visit Nepal Year 1998" with a target to increase tourist number to 500,000 and increase or maintain tourists arrival in the coming years (NPC 2002).

Despite a moderate success achieved by 2000, there was a decline in the arrival of tourists due to political conflict. Manang, being a popular destination for tourists, remained adversely affected for a decade, mainly lower parts, due to insurgency. The long-term vision and strategy adopted for sustainable tourism in the country has also been envisaged in the SDP for Manang. These include: (i) developing tourism sector as an important part of economy and re-establishing ACAP globally as a prime tourist destination *(Map 6)*; (ii) expansion of earning and channelling the benefits accrued from tourism to rural communities equitably through qualitative improvement and local community participation in accordance with the decentralized policy; (iii) promoting sustainable tourism through the conservation of natural and cultural heritage and providing alternative routes throughout main tourist stay points along the feeder road; and (iv) developing environment-friendly safe road and air services by involving other sectors.

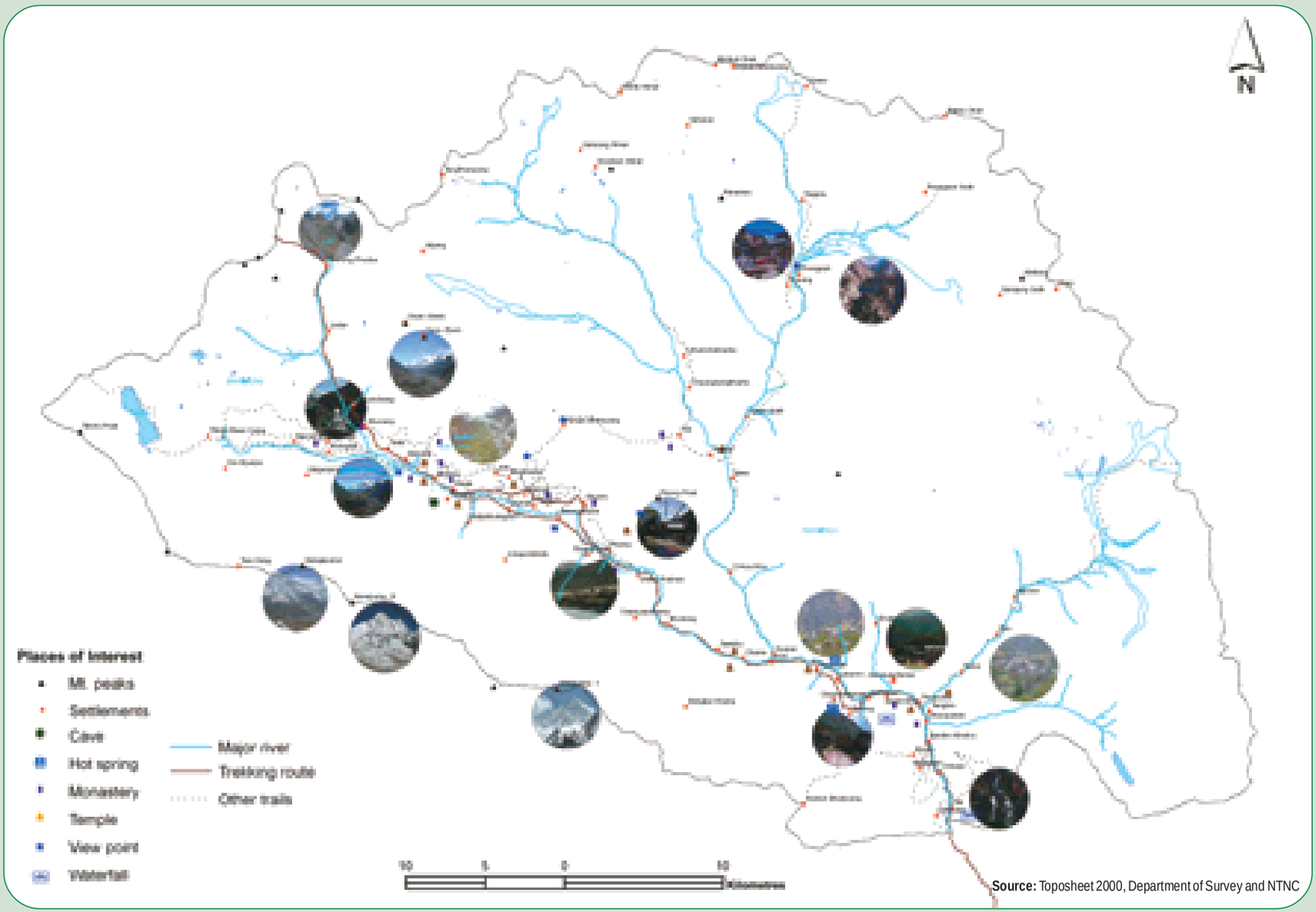
5.3.5 Health

Improving health for all, especially that of vulnerable groups who depend on manual labour, is one of the major challenges. The policy aims at ensuring equitable access to health system in urban and rural areas. The government's policy is to provide maternity services and benefits to women and reduce child mortality, in particular, those living in remote areas. This requires to provide incentives to service-providers and health institutions assisting during child birth.

Photo © NTNC

Traditional healing system is an important practice that provides health care services in remote and inaccessible areas all over the world. Traditional healers (*Amchis)* play an important role to provide health service in the Himalayan region. One of the major challenges in Manang is to integrate traditional healing system based on knowledge and skills with modern allopathic system. In order to conserve knowledge and resources, policies need to be developed to provide national recognition of traditional healers as in India and China.

Map 6: Centres of tourist attraction in Manang district



Source: Toposheet 2000, Department of Survey and NTNC

5.3.6 Education

Achieving "Education for All" is the primary goal of Nepal. Improving access to primary education of local communities, disadvantaged children, women, and improving education quality are two major challenges that need to be addressed. Recognizing the importance of proper education policy for bringing about greater equity, PRSP and Three Year Interim Plan also emphasize the universalization of primary education. The Interim Constitution of Nepal (2006) has ensured citizens to get education as fundamental human right. Recent policies include scholarship schemes to children of disadvantaged communities and those below poverty line.

The strategies adopted by the government are decentralization of school management, including management to communities, and scholarship targeted to women and children from disadvantaged communities. For Manang, the strategies include expanding teachers' training, improving curricula and introducing teachers' materials in local languages, and strengthening supervision by the communities.

5.3.7 Drinking water and sanitation

Unsafe drinking water and poor sanitation are main reasons for high incidence of communicable diseases in Nepal. The government aims to increase drinking water supply coverage and sanitation facilities through decentralized demand-driven opportunities. Key challenges in Manang include improving safe water supply in increasing settlement, urbanization and tourists inflow that require increased demand of water supply. Developing water quality standards/guidelines, and implementing/monitoring requires the involvement of NGOs/CBOs and other support organizations to plan and implement schemes demanded by local communities.

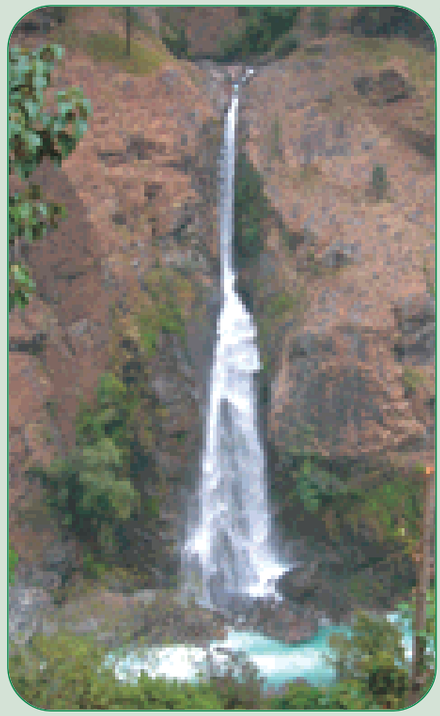


Photo © NTNC

A major concern is also to give high priority to toilet construction by rural households. Availability of drinking water along the trails, particularly Nar and Phoo areas, is another major issue. The above objectives can be achieved through the involvement of communities in the management of drinking water schemes by improving cost-effective mechanism.

5.3.8 Social inclusion

Certain caste and ethnic groups, women, marginalized and poorest of the poor living in remote areas, face additional barriers in getting access to social services and economic opportunities. The primary aim of social inclusion is that targeted

programmes are essential to reach the excluded groups. Realizing this, several efforts have been initiated in the Interim Constitution of Nepal (2006) to ensure social inclusion in all sectors, including political sector.

Several policy initiatives have been taken to achieve the target of social inclusion. The National Foundation for Development of Indigenous Nationalities (2002) has been implementing various programmes and special scholarship packages for disadvantaged ethnic groups. The Local Self-Governance Act (1999) has made provisions for the nomination of disadvantaged community representatives in local bodies aimed at the elimination of economic and social discrimination against *Dalits* and to bring *Dalit* and *Janjati* groups into the mainstream of development. A major challenge in Manang has been to mobilize disadvantaged groups for their meaningful participation in all sectors of the society.

5.4 Environment and Biodiversity

Many legislative arrangements are related to environment and biodiversity conservation. The protection of environment and sustainable development are equally pressing challenges today.


Photo © Dr. Ram P. Chaudhary

Forest Act (1993): The Forest Act empowers the District Forest Officer (DFO) to hand over any part of a national forest to a user group in the form of a community forest entitling it to develop, conserve, use and manage such forests, sell and distribute the forest products by independently fixing their prices as per the operational plan (Section 25.1). However, handing over of a part of the national forest as community forest does not change forest land ownership. Land ownership of community forest remains under the government (Section 67). Nevertheless, it is one of the most progressive provisions of the Forest Act that empowers local communities for the management, development and partial sharing of the benefits arising from such forests.

National Parks and Wildlife Conservation Act (1973): Section 3A of the National Parks and Wildlife Conservation Act empowers the government to delineate buffer zones around the national parks and reserves. The warden is empowered to constitute the requisite number of user committees in coordination with local authorities to be involved in various activities such as community development and

judicious utilization of forest resources, conservation of forest, wildlife, natural environment and natural resources, biodiversity, and other development works.

Soil and Watershed Conservation Act (1982): The Soil and Watershed Conservation Act is essentially aimed at, among others, protecting the agricultural economy from the impacts of various natural disasters. No recognition is given in the legislation to the role of indigenous system of land management to any other form of public participation other than through government controlled user groups.

National Trust for Nature Conservation Act (1983): Under this Act, the government has established the National Trust for Nature Conservation, previously known as King Mahendra Trust for Nature Conservation. The NTNC is mandated as an autonomous and non-profit organization to work in the field of nature conservation. It has been managing two conservation areas—Annapurna and Manaslu. The Act is supported by the NTNC Regulations (1984).

Water Resources Act (1992): The Water Resources Act is to make arrangements for rational utilization, conservation, management and development of all types of water resources available in the country, and to make timely arrangements for determining beneficial uses of water resources, preventing environmental and other hazardous effects thereof and also for keeping water resources free from pollution.

Himalayan National Park Regulations (1979): The Himalayan National Park Regulations have made special provisions for local communities living within the Himalayan protected areas to collect biological resources for their daily requirements such as fuel wood, leaf litter, small pieces of timber and fodder. The regulations also allow local communities to continue to graze their domestic animals on park rangeland. Communities can organize harvesting and make grazing plans in consistent with the park's objectives. They can also control or even stop 'outsiders' from entering the park to harvest resources, and thus help reduce the pressure on natural resources of the area. However, no provisions have been made for handing over park land for management by the communities.

Environment Protection Act (1996): The Environment Protection Act aims to promote conservation and sustainable development and to maintain clean and healthy environment by minimizing the adverse effects of environmental degradation on human beings, animals, plants, nature and material things. This Act specifically defines biodiversity as 'ecosystem diversity, species diversity and genetic diversity'. However, the Act maintains silence to share the benefits arising from genetic resources.

Nepal Biodiversity Strategy (2002): The strategy honours obligations under the Convention on Biological Diversity. It is a commitment by the Government of Nepal and the people of Nepal and serves as a guide to all government organizations,

private sector and civil society organizations for the protection and wise use of biologically diverse resources of the country on a sustainable basis, the protection of ecological processes and systems from genetic to landscape level, and ensuring fair and equitable sharing of benefits to the people. The NBS implementation plans have been implemented by forming National Biodiversity Coordination Committee (NBCC) at the national level. However, its implementation at the district level through community participation has not been effective due to lack of political commitment.

NTFP Policy (2004): The long-term vision of NTFP policy is to boost the economic condition of the country by sustainable utilization of the medicinal plants and non-timber forest products. The policy aims to identify the country's diverse reservoir of medicinal plants and NTFPs by conserving and managing resources by 2020. Key objectives include sustainable development of medicinal plants and NTFPs through *in-situ* conservation, adding value through infrastructure development, processing and enterprise development, assist in social transformation, and earn foreign currency through competitive international marketing of niche products. Implementation of the policy is poor due to monetary constraints and lack of political commitment.

Medicinal plants of Annapurna Conservation Area possess immense cultural and economic values, and provide basic health care for millions of people. Upper and Lower Annapurna region have been identified as Important Plant Areas (IPAs) for medicinal plants (Hamilton and Radford 2007). There is a need to involve community in the identification of medicinal plants and management of IPAs.

Access to Genetic Resources and Benefit Sharing (AGRBS) Bill: The Access to Genetic Resources and Benefit Sharing (AGRBS) Bill has been finalized following Bonn Guideline and is awaiting approval from the parliament. The Bill spells out provisions to facilitate sustainable use and access to genetic resources and fair and equitable sharing of benefits arising out of the utilization of genetic resources. It provides that authority to determine access to genetic resources rests with the national government. Other features of the Bill include: (i) the collectors need to obtain Prior Informed Consent (PIC) from government organizations; (ii) a fair share of benefits goes to indigenous communities for using their traditional knowledge and resources conserved by them; and (iii) capacity building and technology transfer of the country need to be promoted. These provisions may not be achieved unless Community Biodiversity Registration has been institutionalized.

5.5 Climate Change

Climate change is a global issue potentially affecting all types of ecosystems. Accurate projection of climate change is paramount to assess its impacts in the Himalayas which exhibit varied biological and hydrological resources that govern numerous economic activities beyond the boundaries of the Himalayas itself.

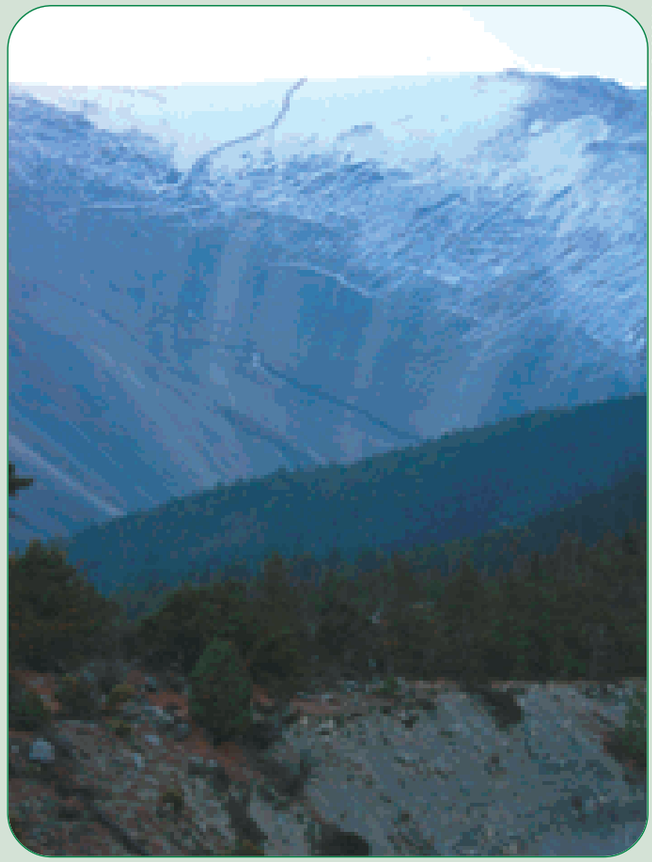


Photo © NTNC

The National Communication Report of Nepal (2004) indicates higher rate of temperature rise in upper mountain region, including the Himalayas. Receding glaciers and formation of glacial lakes are already indicating alarming signals for the future. However, there are uncertainties on the nature of impacts on life, livelihoods and environment.

Climate change at high elevation sites is characterized by high degree of complexity, and high degree of uncertainty (Beniston *et al*. 1997), because of the problems related to the lack of observation and data for the Himalayas. Climate change will likely have greater impact on vegetation, agricultural productivity, glacier retreat in trans-Himalayan districts of Manang and similar areas that exhibit great altitudinal range within short horizontal distances. A small shift in precipitation pattern in the Himalayas could lead to widespread disruption of future water supply. There is a need to examine the impact of climate conditions (temperature, precipitation and extreme weather events) on natural processes and resources (water resources and crop yield), and to infer impacts on human population using simple indices related to livelihood such as food security, water stress, etc. (Berkhout and Hertin 2000).

Vulnerability to climate change in the Himalayas is characterized by economic, institutional and political factors of the regional countries. However, the effects at the local level are specific to social groups who are themselves dynamic (Åase and Chaudhary 2007). Policy regarding the vulnerability and adaptive capacity concepts are still at an initial stage of development, and academic, scientific and indigenous knowledge based approach are needed to measure and understand them in the context of climate change. Local communities with traditional knowledge and experience cope with different strategies to sustain and manage landscape (Salick and Byg 2007). From the data and perceptions of globalization process in Manang, it becomes evident that indigenous peoples' knowledge and perceptions must be incorporated into climate change policy (Chaudhary *et al*. 2007).

The national development plans fail to consider possible impacts of climate change neither in terms of environmental change nor peoples' livelihood, in particular indigenous people whose livelihoods depend on surrounding natural resources that are directly affected by climate change. An urgent need has been to link development activities of Nepal with climate change, and make commitments to undertake further scientific study of observed global warming and its human causes, and observe new set of projections about how climate might change in future on natural systems as well as peoples' livelihoods. A commonly perceived weakness has been the inability to integrate socio-economic change and how this may effect changing human vulnerabilities and adaptation in future. Important conceptual and practical challenges remain in producing future scenarios that can be a useful input for the Himalayan region.

For Manang, a network of researchers should work to develop sustained carbon neutral and carbon negative livelihoods as suggested by Salick and Byg (2007). Some potential activities include:

- Formation of joint network of researchers and indigenous people;
- Documentation of baseline data, monitoring of climate change and vegetation pattern, ecosystem, agricultural, cultural, health and welfare changes;
- Exploration of carbon offset strategies; and
- Development of policy and carbon credit benefit sharing potentials.

In the case of Manang, maintaining socio-economic conditions in many instances may concern simple technological adjustments such as maintenance of water channel for irrigation using polythene pipes (Dannevig 2007), and maintaining the diversification of crops that are suited to the local environment and culture (Chaudhary *et al*. 2007).

5.6 Governance Sector

Local Self-Governance Act (1998): The preamble of the Act requires to utilize the benefits of democracy and maximize the participation of sovereign people of the country (including socially and economically marginalized) through decentralization. The local government legislations, viz., Village Development Committee Act (1992), Municipality Act (1992) and District Development Committee Act (1992) have been repealed by the Local Self-Governance Act (LSGA), 1998. The powers and functions of a VDC under LSGA are divided into 11 broad areas, namely, agriculture; rural drinking water; construction and transport; education and sports; irrigation, soil erosion and river control; physical development; health service; forest and environment; language and culture; tourism and cottage industry; and miscellaneous.

Natural heritage covers forests, rivers and wetlands. Forests are the property of VDC, and this provision is inconsistent with Forest Act, 1993. The DDCs are required to formulate participatory periodic and annual plans for the development of Manang.

CHAPTER 6

VISION, GOAL, OBJECTIVES AND ACTION PLAN

6.1 Vision

Transform Manang into a mountain district with a high quality of human life through balanced progress in economic, social and environmental conditions.

6.2 Overall Goal

Improve, without degrading the resource base and the environment, the living standard of the people of Manang in which every citizen has access to basic services and guarantee of fundamental human rights, including economic, socio-cultural and environmental rights.

Table 6.1: Indicative socio-economic targets of Manang's Sustainable Development Plan

Indicators	2006 (base year)	2011 (road start)	2036
Overall poverty level (% of population)	21.2	11.0	5
Per capita income (US$ 504) growth (% p.a.)	1.3	5	5
Infant mortality rate (per '000)	88.46	45.0	10
Average life expectancy (years)	57.03	65.0	75
Population growth rate (%)	5.2*	5*	1.2
Literacy (%)	52.2	70	96
Female literacy (%)	33.4	60	96
Drinking water (% population)	93.36	100.0	100.0

**This is because of returned migration. It will continue for some time. Population related activities will help in reducing population growth rate.*

Table 6.2: Indicative environmental targets of Manang's Sustainable Development Plan

Indicators	2006 (base year)	2011 (road start)	2036
Use of fuel wood (per household) kg/day	9.24	4.0	0.2
Use of fuel wood (per hotel/restaurant) kg/day	44.7	15.0	1
Use of non-renewable alternative energy (% of cooking and heating)	–	60	10
Use of hydro power and solar energy (%)			
• lighting	90	100	100
• cooking	0	40	90
• heating	0	40	90
Use of organic manure and insecticides (% of total amount used–organic and inorganic)	95	60	90%
Forest area as percentage of total area	8.5	10	15
Level of pollution of all types	NA (nil)	Within WHO limit	Within WHO limit
Tourism growth rate (13,900 in 2006 considering the normal year) % p.a.	–	10	10

6.3 Manang Plan: Objectives and Activities

Objective 1: Protect and Promote the Identity of Manang by Conserving Manang's Unique, Vibrant and Valuable Cultural Landscapes

- **Activity 1.1:** Support religious, cultural and community institutions to be more active in cultural preservation and promotion in areas such as Nyeshang, Nar, Phoo and Gyasumdo
  - Identify heritage zones and undertake development activities within proper guidelines
  - Encourage teaching of appropriate local language and culture in schools and other local institutions
  - Support monastic schools for religious studies and aspiring monks, and identify programmes to engage them in the district
  - Strengthen the links between culture and conservation through different programmes in schools and the community and encourage monastic head (Head Lamas) and monks to become cultural and environmental ambassadors
  - Document indigenous knowledge of *Amchis* and others
  - Cooperate with other national and local bodies to generate awareness about Manang and attract visitors by organizing different types of festivals
  - Assist in getting national recognition of valuable cultural resources of Manang

- **Activity 1.2:** Support local cultural and religious bodies to prepare a complete inventory (photographic documentation, micro films, listing, etc.) of all monuments, sites, artefacts and valuables that have high cultural, historical, religious and archaeological significance in places such as the Tashi Lakhag Gomba
  - Develop documentation of all artefacts
  - Develop an archive of indigenous people
  - Help in strengthening the Manang village museum

- **Activity 1.3**: Assist in the preparation of a phase-wise restoration and maintenance plans of important historical sites, cultural and religious monuments in monasteries such as Tashi Lakhag Gomba, Pocho, Tare, Karma Samten Chokkor Ling, Ghale King's Fort and others
  - Support restoration and maintenance of cultural heritage
  - Develop and regulate codes for buildings and other development activities around other sites to reflect local architecture, craftsmanship and harmony with local culture
  - Build capacity of local institutions to better monitor and regulate the implementation of building codes, and protection and conservation guidelines

Objective 2: Use the Natural Environment Positively and Wisely

- **Acitivity 2.1:** Institutionalize management of natural resources and environmental conservation ensuring the benefit sharing mechanism
  - Increase capacity of local organizations, including the prevailing *Mukhiya*, *Dhawa Sherpa* and *Ama Toli* systems to manage and use their natural resources based on the principle of equitable benefit sharing by all stakeholders
  - Protect identified and potential biodiversity hotspots and environmentally sensitive areas, especially in trans-Himalaya and biodiversity rich areas (such as Nar, Phoo, Tilicho, Yak Kharka, Kera Gumba and others) from any form of activity that would lead to environmental degradation

- **Activity 2.2:** Promote and enhance biodiversity conservation for local, national and global benefits
  - Collaborate with local stakeholders to implement a conservation management plan with key milestones, focusing on:
    - a comprehensive inventory of different ecological landscapes and their preservation
    - the status (use, value, endangered, threatened, extinct, endemic, invasive alien species, etc.) of flora and fauna species, and their preservation
  - Options for improving economic utilization and domestication of NTFPs/MAPs and other natural resources beginning through value addition (processing, etc.)
    - establish user-friendly biodiversity data base and community monitoring systems for management purpose
    - preserve local (traditional) knowledge on biodiversity, traditional healing system, ethnomedicine and agrobiodiversity management
    - generate awareness on CAMR and CAMD in collection and encourage its adoption
  - Explore potentials of using abandoned farmland for domesticated cultivation of NTFP and MAPs

- **Activity 2.3:** Collaborate with local partners to develop guidelines for the implementation and monitoring of district water security strategy focusing on:
  - Local needs of drinking water, irrigation and clean energy needs
  - Protection of water hazards to people and their assets
  - Full adoption of EIA guidelines by major hydro electricity projects
  - Fair share of local benefits from major hydro electricity projects

- **Activity 2.4:** Strengthen community-based sustainable management of forest resources giving priority to degraded forest areas and focusing on:
  - Sustainable harvesting of fire wood, NTFP and MAPs
  - Promoting alternative fuels
  - Identifying degraded forests and developing them by involving local institutions

- Controlling timber extraction for construction along new road alignment
- Documenting local institutions that conserve and regulate forest resources

- **Activity 2.5:** Improve the quality of rangelands by giving priority to:
  - Improving traditional grazing practices by better understanding of livestock pressures on such land
  - Enhancing productivity of rangeland and rehabilitation of degraded lands by designing locally sustainable interventions

- **Activity 2.6:** Strengthen awareness and capacity of local organizations to keep Manang free from all biological and non-biological forms of pollution of renewable natural resources such as water, soil and air, arising out of increased tourism, commercialization and construction boom

- **Activity 2.7:** Help to establish security and compensation mechanisms on the loss of livestock and crops from wildlife depredation
  - Develop participatory monitoring mechanism to periodically assess such loss
  - Introduce compensatory measures such as livestock insurance policy
  - Develop improved herding practices like predator proof corral practised in Mustang area

- **Activity 2.8:** Strengthen local and national capacity in developing and implementing a biodiversity monitoring system and production of regular monitoring reports to reflect: (i) status and distribution of vegetation, functional flora, indicator and flagship species and other valuable species; (ii) role of alien and invasive species, including ways of eradication; (iii) conditions regarding access to genetic resources; (iv) impact of climate change on local flora and fauna; and (v) develop and maintain a comprehensive data base of biodiversity resources

Objective 3: Improve Access to Livelihood Options for the Poor, Marginalized Groups, Aged, Women and Children

- **Activity 3.1:** Make Manang "free from poverty and hunger" district focusing on:
  - Developing a food security strategy and ensuring that stocks of basic food items are maintained for at least six months in vulnerable areas
  - Developing a better distribution system in remote parts
  - Undertaking Food for Work programme to provide income and food to people
  - Encouraging business and commercial enterprises to sponsor food distribution for disadvantaged groups
  - Identifying groups vulnerable to impacts of various natural disasters and other types of vulnerability, in particular, poor, disabled, widow and children by involving local partners to develop strategy for mitigating and monitoring impact of various natural disasters, food shortages and other specific group related problems.

- **Activity 3.2:** Improve Manang's position in development indicators as set in MDGs focusing on:
  - Establishing district poverty monitoring and assessment system to monitor performance achievements of MDGs, PRSP and Interim Plan targets dealing with:
    - reducing the percentage of population below one dollar a day
    - reducing the percentage of population below the national poverty line
    - reducing the percentage of population below minimum level of dietary energy consumption
    - reducing the percentage of stunted children aged 6–59 months
    - completing enrolment in schools of all primary school going age children
    - improving percentage of children starting grade 1 and completing grade 5
    - improving substantially the rate of literacy between ages 15–24
    - improving the ratio of girls to boys in primary and secondary education
    - improving the ratio of women to men at tertiary level of education
    - improving the ratio of literate men and women, ages 15-24
    - improving the share of women in wage employment
    - increasing the proportion of seats held by women in district political bodies
    - reducing substantially infant mortality, under 5 mortality and maternal mortality rates
    - increasing the percentage of immunized children
    - improving the deliveries attended by health care providers
    - expanding the use of contraceptives
    - reducing the prevalence of HIV, malaria and tuberculosis
    - increasing the area under forests and protecting areas designated for maintaining biological diversity and unique landscapes
    - improving access to safe drinking water, toilets and better sanitation
    - improving access of villages and settlements to road head.

- **Activity 3.3:** Promote gainful self-employment in natural resources, tourism and other potential sectors in the changed context of improved access and opportunities created by:
  - Providing capacity and skill enhancement training to youth from the poor and marginalized groups
  - Improving access of local people to financial and non-financial services as well as natural resources, including forest, water resource and land
    - create enabling environment for increased local investments and employment generation
    - promote decentralized recruitment processes and procedures of both public and private offices, companies and enterprises giving priority to local people
    - implement provisions of equitable and fair labour policies and ensure rights, entitlements, security and benefits to women workers and others from disadvantaged communities

Objective 4: Accelerate Growth in Productivity of Agriculture, Livestock and other related Economic Activities

- **Activity 4.1:** Promote productivity of crops and livestock:
  - Improve productivity of traditional cereal and non-cereal crops
  - Promote the use of equipment to reduce the drudgery of farm work burden of women
  - Encourage the development of high value cereal and non-cereal crops, including livestock products that are environmentally sustainable
  - Promote the comparative productivity of organic farming
  - Motivate domestication of medicinal and aromatic plants
  - Monitor crops, non-crops and livestock production and productivity changes with reference to policies regarding exotic and endemic varieties

- **Activity 4.2:** Promote the development of credit and marketing services:
  - Encourage formation of groups and cooperatives for mobilizing and expanding credit and marketing services
  - Generate awareness of the benefits of marketing environmentally safe products
  - Facilitate access to off-season markets for local products
  - Promote awareness of special products of Manang

- **Activity 4.3:** Generate better awareness, skill, capacity and services for the development of environmentally sound high value organic agriculture and livestock products:
  - Organize consultation of farmers and pastoralists, both women and men, to better understand the problems and opportunities in the development of agriculture and livestock sectors
  - Organize farmer visits, including women farmers, to other similar environments experiencing high value crop production, new marketing linkages and institutional changes
  - Identify improved agriculture and livestock related skill enhancement and awareness generating packages and mobilize support for the implementation of training packages
  - Encourage markets to be locally and environmentally-friendly and diversify services provided in tourism, natural environment conservation, renewable energy resources and business development
  - Develop awareness campaigns (food festivals, value addition, etc.) to promote local food culture and knowledge which is based on food produced in local ecosystem
  - Promote local yak cheese and market it as a special Manang product

- **Activity 4.4:** Undertake scientific and participatory research to identify and conserve globally important genetic resources of cereal crops, horticultural crops, livestock and wild species, including *Allium* species, *yarsagumba*, *Aconites*, etc.
  - Support to develop gene bank

- **Activity 4.5:** Conduct EIA/IEE and establish local enterprises or factories based on milk products (cheese), seabuckthorn, apples (brandy), wild allium (*jimbu*), etc.

Objective 5: Promote Sustainable Tourism focusing on Manang as a Unique Destination

- **Activity 5.1:** Identify and develop alternative trekking routes offering similar or better choices, in terms of experiences and adventure, as a viable substitute to the current Annapurna Circuit Trek:
  - Identify viable alternative routes of short (less than a week) and long (2-3 weeks) duration around the Annapurna massif
  - Encourage development of trekking routes to avoid potential crowding and congestion problems
  - Use villages as focal points to attract tourists (students, religious pilgrims and others) developing a range of tourism products and activities suitable for different groups (trekking, rafting, sports, pilgrimage, sacred site experience, meditation, high altitude wilderness, biodiversity hotspots, and others)
  - Promote village tourism

- **Activity 5.2:** Encourage local—private sector and community groups to invest in tourist facilities:
  - Encourage banks and financial institutions to support private and community groups to invest in marketing and promotion of new trekking routes, facilities and services
  - Enhance local entrepreneurial skills and capacities in product packaging marketing, promotion, networking and linking to national, regional and international travel and tour agencies
  - Control haphazard development of settlements and tourism facilities along the road and trekking routes, particularly in environmentally sensitive forest and alpine areas focusing on:
    - acceptable standard for lodges, camping sites and other facilities
    - identify and designate areas for tourism facilities—lodges, camping sites, tea shops, etc.
    - identify infrastructure requirements (trails, bridges, sign postings, pits, incinerators, information/visitor centres, fuel depots, etc.) where appropriate
    - set high environmental standards for other subsidiary tourism industries and make them socially responsible (comply with social, cultural and environmental norms being promoted in the district)

- **Activity 5.3:** Improve capacity for communication and information dissemination (print and electronic) of tourism related information and awareness generating materials for tourists, trekkers and local people focusing on:
  - Information about fee and levy, visitor safety and security, rules and regulations about treks and other activities, contact persons and organizations for special needs, biodiversity hotspots and other important issues
  - Training local people as tourism entrepreneurs in developing, diversifying, packaging and marketing new tourism products such as wildlife based, nature based and heritage based activities suitable for all types and age groups
  - Developing a monitoring system to ensure equitable benefits of new trekking routes as well as for maintaining minimum environmental changes
  - Continuing with the current policies regarding waste management and fuel sufficiency until viable alternatives for these become feasible
  - Studying the carrying capacity of the valleys on different types of tourism
  - Developing and disseminating Nar and Phoo valley characteristics as tourist destinations
  - Monitoring changes in the society, economy, environment and tourism sectors policy feedback

Objective 6: Manage Growing Settlements in an Environmentally-friendly Manner

- **Activity 6.1:** Maintain the urbanization and settlement growth in harmony with the prevailing social, environmental and cultural integrity concentrating on:
  - Developing building and housing codes to reduce adverse impacts on environment and local architectures
  - Specifying minimum facilities such as sewerage, drainage, street lighting, public space, car park, bus terminals, dumping sites, waste collection, disposal systems, etc. for settlements
  - Promoting land use zoning based on environmental, land suitability, cultural heritage, public facilities (car park, bus terminal, treatment plants, etc.) office blocks, markets and other considerations
  - Developing a plan for each settlement that has potential for rapid growth
  - Safeguarding corridors, open areas and hotspots
  - Reducing vulnerability and designing better alternatives (Tal and Bagarchhap villages)

- **Activity 6.2:** Develop regulations and monitoring mechanism to maintain highest environmental standards in cultural landscapes
  - Enhance the capacity of CAMC and other local institutions for the preservation of cultural landscape
  - Help them develop sustainable standards and plausible regulations
  - Develop and implement participatory monitoring mechanism

Objective 7: Develop Basic Infrastructure and Services in an Environmentally-friendly Manner

- **Activity 7.1:** Integrate building and construction activities under the overall guidance of DDC focusing on:
  - Preparing and implementing a district infrastructure development strategic plan
  - Developing a district monitoring system and ensuring that adequate resources are allocated and utilized for meeting basic infrastructural requirements
  - Improving decentralization and effectiveness of public services and guaranteeing community involvement in the delivery of different public services

- **Activity 7.2:** Complete the high standard environmentally sound road giving due consideration to:
  - Improving physical accessibility of a maximum number of settlements in the district by increasing connectivity with other roads and tracks
  - Minimizing adverse environmental impacts of road
  - Improving market integration
  - Providing properly planned bus stops, resting places, toilets (for both male and female), and road side shops, as required
  - Ensuring road safety and security (use proper signs in symbols and local languages, set speed limit in ecologically and cultural sensitive areas, under-road passes for wildlife, pedestrian path, etc.) for human, animals and wildlife
  - Supporting the building of other feeder roads
  - Developing programmes to generate awareness on all aspects of road

- **Activity 7.3:** Promote the development of hydro electricity resources in a socially desirable, economically viable and environmentally acceptable manner focusing on:
  - Mobilizing interested parties to prepare feasibility studies of most potential projects for generating hydro power
  - Facilitating negotiations with concerned parties for the implementation of investments for power generation
  - Encouraging hydro electricity for all uses—heating, cooking, lighting and industrial purposes
  - Providing local tax and other incentives to encourage involvement of local people in hydro power generation ensuring EIA

- **Activity 7.4:** Provide incentives for the development of alternative energy sources and use of fuel-efficient technologies focusing on:
  - Making Manang self-reliant in energy sources
  - Meeting energy requirements from clean energy sources
  - Promoting sustainable forest management systems, and equitable sharing of benefits accruing to local communities

- Emphasizing the development of green energy sources, particularly those based on local resources (bio-briquette, wind and solar)
- Encouraging sustainable collection and harvesting of fuel wood from the forest specified on rotation basis by ensuring no harm to forest and species that need protection
- Collecting large scale fuel wood by using pack animals
- Establishing a participatory monitoring system to reduce adverse impacts on forest due to increasing population and development

- **Activity 7.5:** Improve access to piped water and solid waste disposal system to the residents encouraging:
  - Mobilizing community groups for increasing the coverage of piped drinking water to local population
  - Encouraging households to have proper sanitation and waste disposal facilities
  - Keeping Manang free from all forms of pollution related with drinking water and solid waste

Objective 8: Build Capacity of Local Organizations and Strengthen Partnerships with Community and Other Organizations

- **Activity 8.1:** Encourage group formation in all aspects of local level planning, implementation and monitoring of Sustainable Development Plan activities concentrating on:
  - Mobilizing and encouraging the participation of households in all settlements and villages to participate in groups for undertaking development activities
  - Organizing into specific activity groups for collective development action
  - Articulating own development priorities and those specified by MDGs and PRSP, including key environmental issues and formulating a consolidated, integrated and viable local plan of activities
  - Mobilizing all available support locally, and from the district and other sources for the implementation of the local plan
  - Interacting with concerned local government authorities, line agencies, NGOs and agreeing a framework for systematic implementation of the Plan
  - Discussing and finalizing with specific private groups about their contribution
  - Identifying specific responsibility for implementation, monitoring and feedback on progress
  - Identifying and implementing with the support of other groups different awareness raising, training and capacity building activities at the local level

- **Activity 8.2:** Improve coordinating and monitoring capacity at the ward and village development committee levels focusing on:
  - Integrating proposed activities from the groups in the settlements and villages
  - Coordinating interaction for finalizing activities and support levels with the

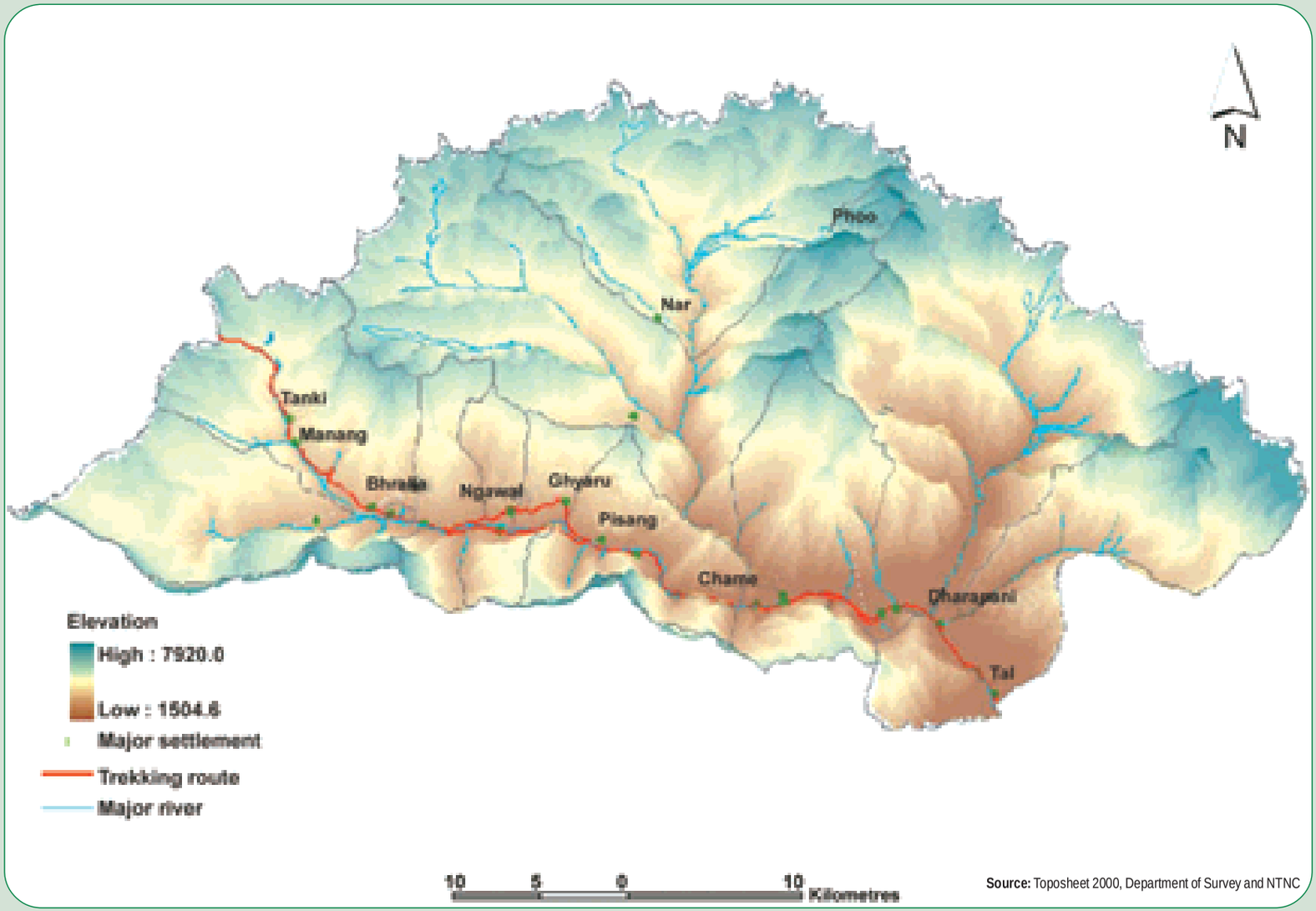
district government, line agencies and other organizations
- Coordinating implementation and monitoring of progress
- Organizing training and awareness programmes to generate technical skills and facilitate awareness, implementation and participation in the community

- **Activity 8.3:** Improve coordination, monitoring, evaluation and mobilization capacity in different organs of the district government, especially DDC, focusing on:
  - Reviewing demands from local units, prioritizing based on local needs and national development goals and priorities, and providing adequate resources to implement the activities
  - Integrating plans and programmes from different organizations to avoid duplication and strengthening support for local and national priorities, especially MDGs, PRSP and environmental issues
  - Monitoring overall progress on the implementation of priorities and providing feedback at local and national levels
  - Undertaking capacity building activities for the overall improvement of district and lower level capability for undertaking sustainable development activities
  - Mobilizing resources from all potential sources for sustainable development

- **Activity 8.4:** Integrate NGOs and other organizations to support sustainable district development plan focusing on:
  - Collaborate with district government and other organizations to increase capability of household groups, CBOs and others to improve planning, implementation and monitoring of sustainable development activities
  - Helping district government and community organizations to design innovative programmes for sustainable development, bringing successful experience and knowledge from other areas
  - Mobilizing resources, skills and identifying technologies appropriate for sustainable development
  - Undertaking advocacy for mainstreaming those excluded from development and monitoring the implementation of the changes in the poor participating and benefiting from development

- **Activity 8.5:** Integrate private sector in sustainable development focusing on:
  - Establishing environmentally-friendly milk, vegetables, fruit and NTFP processing plants
  - Exploring public private enterprises
  - Encouraging private investment in social sector such as health and education (establishing sanatoriums, electronic production centres, etc.)
  - Establishing hotel and health clubs

Map 7: Three-dimensional elevation map of Manang district



Source: Toposheet 2000, Department of Survey and NTNC

CHAPTER 7

IMPLEMENTATION STRATEGY AND THE ROLE OF ACAP

Sustainable development is a holistic approach to development and environmental conservation with different agencies involved in the promotion of various components. There are different government, non-governmental and civil society organizations, and other stakeholders in the district. They need to be involved in an integrated and coordinated manner both during planning and implementation of the activities.

7.1 Role of Different Agencies

(i) Community-based organizations and household user groups in settlements and villages

As development has become more decentralized and participatory, community-based organizations and household user groups in different settlements and villages, including towns and market centres, are becoming increasingly important for decisions (planning and implementation) regarding local development activities. While the experience so far has been encouraging, especially where such organizations have been actively promoted in the country, they are either completely absent or perform quite unsatisfactorily. However, NTNC has been promoting community-based approach in ACA from the very beginning.

In the case of Manang district, efforts have been made to promote local organizations. In future, a great deal of strengthening is needed to improve the capacity of many different types of local organizations. If the fulfillment of the MDGs are to be seriously pursued, active participation and mobilization of households and community-based institutions will be critical. Their role will be to systematically identify the MDG gaps in their respective areas and groups focusing on the most needy and distressed households. These individual requirements should be consolidated and submitted for support to the VDC and district level governments and through them to other line agencies and special projects. In the past, mobilization across the district at this scale has been seen only in political events or in the vaccination of children. Similar effort is needed to enhance the ownership and implementation of the household and community related components of the Manang Sustainable Development Plan.

(ii) Ward and VDC governments

The main role at this level is to strengthen, coordinate and consolidate local level demands and requirements. Additional responsibility may also be to identify and

help implement critical social and physical infrastructure that may be needed at the local level. Many of the functions at this level have been identified in Local Self-Governance Act. What is now needed is their more rigorous implementation. This level of the government should be a major voice for advocating local needs of their residents and gaining support from different organizations at higher levels. Facilitating implementation of local projects is also an important responsibility at this level, including monitoring of impacts and the pace of the implementation of projects.

(iii) District level government, including line agencies

Given the fact that significant components of the Sustainable Development Plan are part of the regular responsibilities of the district government and the different sectoral line agencies, there is a major role for the district government and district line agencies. From articulation of specific district sectoral strategies to the design, funding and implementation of specific projects, all organs of the district government must play a critical role in the successful implementation of the Plan. In this context, mobilization of different partners from the community, NGOs, private sectors and other agencies will also be important as the district government has only limited resources and capacity for the implementation of this comprehensive Plan.

In order to facilitate better understanding, awareness and commitment of different agencies to the Plan, the district government, along with NTNC, should organize broad-based consultations and agreements on the specifics of the Plan as it provides adequate scope for local fine-tuning.

(iv) District NGOs, private sector and *Manang Bikas Samiti*

All the above group of organizations can become important players in the district development in future if they are given the opportunity. In the past also, some of these like *Manang Bikas Samiti* have played an important role with their strong links to relatively big business houses in Kathmandu. In the local tourism business, local private sector will continue to play an important role. There is a need to diversify the involvement of NGOs and private sector into other development activities as well.

(v) Conservation Area Management Committee (CAMC)

The ACAP covers 55 VDCs in five districts, including Manang. Each VDC has a political body elected by people. In order to address conservation issues, each VDC has a Conservation Area Management Committee (CAMC), which has been formed according to the Conservation Area Management Regulations. Within this committee, there are many other sub-committees or institutions such as lodge management committee, forest management committee, women development committee, etc. Each CAMC consists of 15 members in which VDC chairperson has been designated as ex-officio member, nine members are nominated by people from nine wards, three members are represented from special groups—women, *Dalits* and social workers, and the remaining two are elected to complement the works of the chairperson and secretary.

The Conservation Area Management Regulations (1996) guide the formation of these local institutions and their functions.

(vi) Annapurna Conservation Area Project and National Trust for Nature Conservation

The NTNC has established ACAP Headquarters in Pokhara and seven field offices in different locations—Ghandruk, Lwang, Sikles, Bhujung, Manang, Jomsom and Lo Manthang (*Map 1*). Location of these field offices also reflect the management zone concept formulated in 1986. Under this concept, different areas were demarcated depending upon their management needs and potentialities. One of the field offices is in Manang district. Major concern of this office has been tourism management and biodiversity conservation. As the construction of road network is expected to bring about many changes, a new approach needs to be adopted for the conservation and development that meets peoples' expectations to improve livelihoods and at the same time conserve natural resources.

The NTNC/ACAP, at present, is an agency more specialized in natural resource conservation and environment protection. In order to analyze what could be its role in implementing SDP, a matrix of different activities under 'sustainable development' are shown in the table below formed by two coordinates—importance in sustainable development and ACAP's influence.

The areas considered important for NTNC/ACAP and in which NTNC/ACAP has more influence, expertise and relevance are given in the box below. These areas should be the priority for NTNC/ACAP in terms of its full time involvement. Other areas are also equally important to bring about sustainable development. The role of NTNC/ACAP in this regard is to influence these offices to implement the sustainable development policies. For this to happen, NTNC/ACAP, in essence, should help in mainstreaming environmental concerns in the planning process, monitor its activities,

Table 7.1: Importance of different sectors and the role of NTNC/ACAP

Importance	
High	**Low**
biodiversity, climate change, cultural heritage and tourism	income and livelihoods, agriculture and food security, energy
(ACAP as lead agency)	**(facilitating agency—mainstreaming SD agenda and monitoring, feedback)**
natural disasters, air, water, soil and noise pollution, housing, settlement and urbanization, forestry and NTFPs	demographic dynamics, health, education, women development, migration and remittances, trade, industry and non-farm enterprises.
(Partner agency—mainstreaming SD agenda and monitoring, feedback)	**(influencing agency)**

Based on the above matrix, the role of NTNC/ACAP can be summarized as:

- ACAP as a 'lead agency' (high involvement and high importance—directly involved in execution; eg. biodiversity conservation)
- ACAP as a 'partner agency' (high importance but low involvement—provides matching funds but does not work as a direct implementer—eg. community development)
- ACAP as a 'facilitating agency' (low importance and high involvement—provides expert inputs but little or no funds for activities; eg. agriculture, horticulture, livelihood analysis)
- ACAP as an 'influencing agency' (low involvement and low importance—provides little inputs but maintains a high strategic interest (pollution and settlement issues)

evaluate impacts and provide feedback of its findings to the line agencies. It should also help in developing the capacity of these line agencies in integrating environmental conservation values in the planning process so that in future they can carry out this task for themselves. Research to generate knowledge of the environmental status and standards required for the district will also rest on NTNC/ACAP.

The sustainable development goal, objectives and activities identified in Chapter 6 are guidelines for the policies and programmes of DDC/local government and NTNC—the principal implementing agency of the Plan. It is expected that these guidelines are to guide the policy, programme and budget formulation each year in DDC, in various governmental offices, NGOs and civil society. The lessons learned, the analysis of successful and failure cases, will also inform the formal policy making at the higher level. A mechanism to inform the lessons learned from the micro level to the higher level needs to be prepared so that local knowledge and experiences are also taken into account. The public auditing of the Plan, budget and its expenditure will also increase its transparency. Local agencies should have the capacity to plan, monitor and evaluate the activities. There will be a formal process to take the lessons of these agencies to the higher levels.

The NTNC will work at the national and international levels to mobilize full support for the implementation of the Plan. Without a strong support from the national and international levels, the Plan is unlikely to make much progress. Already local resource constraints are quite severe for organizing new activities. The Plan's proposed activities are new and comprehensive requiring significant injection of financial resources.

The NTNC must use all its influence to bring together different national and international organizations and convince them of the importance of this Plan. In the past, there have been excellent piecemeal activities and time has now come to move beyond just a few isolated projects towards the implementation of the Sustainable Development Plan for Manang district.

7.2 Coordination of District Level Planning and Monitoring

A district level District Conservation Area Management Committee (DCAMC) will be formed (Bajracharya 2004). This Committee, of which NTNC/ACAP can be the secretariat, will coordinate the activities of all related agencies and play an active role in streamlining these activities for sustainable development. As the planning process in the district does not take into account environmental concerns, this Committee will monitor and evaluate the achievements against the targets and reformulate targets according to the achievements and constraints faced. The NTNC/ACAP's grassroots institutions can also be mobilized so that they work in close coordination with other local institutions.

The following chart shows how coordination mechanism can be achieved. The DDC in Manang has its own planning process under which VDC and *Ilaka* will make plans to be sent to DDC. The DDC and line agencies will revise the plans for submission to the DCAMC. A new stratus will be added which will look after the Plan and review the environmental concerns.

The DCAMC will also examine the sustainable development goal, objectives and activities, and distribute them to related stakeholders for implementation. The NTNC will monitor and submit the report to the DDC through DCAMC recommending the DDC to formulate necessary regulations and policies for the district.

7.3 Regulating Development in Manang

The DCAMC needs legal authority in order to influence decision-making processes in the district and facilitate implementation of sustainable development policies by amending the existing Conservation Area Management Regulations. Similarly, the

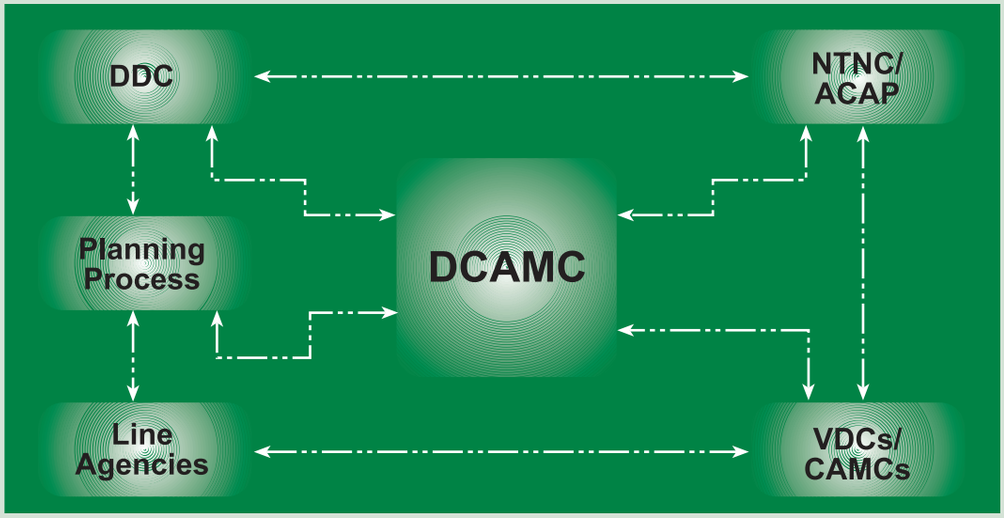


Photo © Dr. Ram P. Chaudhary

planning process that has to consider environmental and biodiversity concerns needs to be made mandatory through legal provisions so that proper process is followed in initiating development interventions in the district.

7.4 Role of the State and International Agencies

Manang is a district located in the trans-Himalayan region, which is a hotspot of biodiversity and cultural uniqueness. This region is directly affected by global changes, including climate change. It is here where the impact of climate change can be easily noticed. Even though it seems that climate change might have brought about a few positive impacts, it is revealed that people are also affected adversely. These people, without the access to road network and other indicators of human development, have the right to development and to enjoy the fruits of modernization. Therefore, it is the responsibility of the global community to allocate resources to such areas where people are conserving the resources and biodiversity despite problems in their development. The state should also give more resources to the district for various benefits this district provides to the downstream villages and people.

CHAPTER 8

BUDGET AND MONITORING PLANS

8.1 Budget Plan

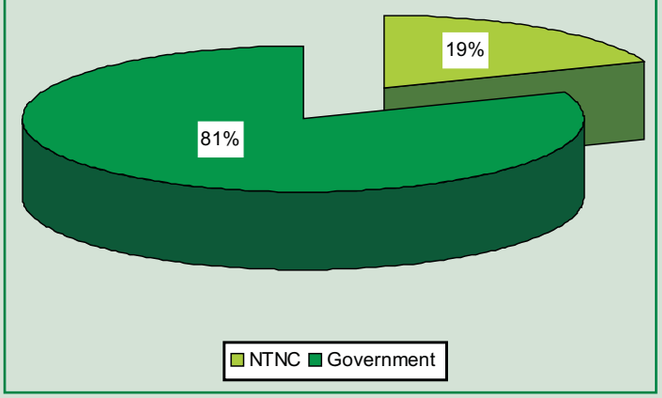
Current pattern of expenditure

The total government expenditure in 2006/07 in Manang district was about Rs. 51.35 million *(Table 8.1)*. This amount has been mainly allocated to four areas, which includes livelihood options for the poor, improving productivity of economic sectors such as agriculture and livestock, development of basic infrastructure and capacity building of local organizations. It should be noted that practically no resource has been allocated to cultural preservation and even for tourism from the government side–at least the present budgetary heads do not show this very clearly. Similarly, support for developing settlements is also absent. Bulk of the government support is going to infrastructure and capacity building, which accounts for almost 51 percent of the total resources going to the district. On account of the lack of information, it is not possible to provide further breakdown of the government expenditure.

Other important source of resource for the district is the NTNC/ACAP. The estimated total NTNC/ACAP expenditure in the district for 2006/07 was about Rs. 11.87 million *(Table 8.1)*. This includes some important expenditure components made in previous years but not included in 2006/07. This has been spread over more areas than the government resources. About 10 percent is being provided for the conservation of environment. Clearly, the government and NTNC/ACAP expenditure is quite complimentary, with NTNC/ACAP strong on the conservation front and the government strong on infrastructure and capacity building.

Looking at the allocation of resources from both the government and NTNC support as reflected in *Table 8.1* and *Fig. 8.1*, basic infrastructure receives the largest share followed by capacity building, livelihoods, economic activities and environment. The relatively larger share of government expenditure in non-environmental areas is quite evident from the combined account.

Fig. 8.1: Base year expenditure



Proposed Plan outlay

The prevailing political instability makes it very difficult to discuss about the availability of resources and planning. Changing political situation can drastically alter priorities even in the short run. Furthermore, there are many discussions about political and administrative changes which can influence many aspects of district planning. However, for the present there is no basis to predict how things will move and the best option is to continue to use the past as guidelines for future. Under the circumstances of high uncertainty, a conservative estimate of a ten percent increase in the current level of support has been used for the resources coming from the government and ACAP. There will be additional resources coming from private sectors and from local sources but this has not been estimated. Even assuming certain percentage of the total is quite difficult at present .

Annual resources for the first year of the Plan from the government and NTNC is about Rs. 404 million and this increases in the fifth year to Rs. 592 million. This appears to be quite realistic given the uncertainties of the present. The total Plan outlay for the five years is about Rs. 2470 million (*Table 8.1)*. Twenty six percent goes to basic infrastructure development on account of relatively low development intervention in the district. Next priority goes to livelihoods improvement which receives 19% of the support. The central government should give high priority to complete the present road. The present plan has not included the cost of road construction. However, it is estimated that Rs. 215 million needs to be invested for over five years period on road construction.

As indicated earlier, the political situation in Nepal increases the uncertainties for the Plan. There are local uncertainties on account of changing local political priorities and conditions introduced not only by road but also bigger opportunities for major hydro electricity projects which could pump in significant level of resources into the local economy. There are national level uncertainties in terms of resources, development priorities and political stability. There are uncertainties of support from international level for environmental conservation and sustainable development planning because of the unfolding political scenario of Nepal—which in the current context appears to be addressing mostly immediate pressures and priorities. The NTNC has a major role in working together at the local, national and even in international levels with different partners in order to promote Sustainable Development Plan for the people of Manang. It must ensure that adequate resources are forthcoming and the Plan implementation process is smooth and effective in reaching its goals.

Table 8.1: Government and NTNC Budget (Rs.) for Manang's Sustainable Development Plan

							For Five Years						
	Activities	Government	Gov.	NTNC	NTNC	Total	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Total (%)
	OBJECTIVES													
A.	**Protect the Identity of Manang**		(%)		(%)		(%)							
1.	Encourage traditional insitutions	-	0.00%	450,000	0.71%	450,000	0.71%	5,000,000	5,500,000	6,050,000	6,655,000	7,320,500	30,525,500	1.24%
2.	Prepare a complete inventory	-	0.00%	275,000	0.43%	275,000	0.43%	2,500,000	2,750,000	3,025,000	3,327,500	3,660,250	15,262,750	0.62%
3.	Prepare and implement a phase wise repair maintenance plan	-	0.00%	500,000	0.79%	500,000	0.79%	30,000,000	33,000,000	36,300,000	39,930,000	43,923,000	183,153,000	7.42%
	Sub-total	**-**	**0.00%**	**1,225,000**	**1.94%**	**1,225,000**	**1.94%**	**37,500,000**	**41,250,000**	**45,375,000**	**49,912,500**	**54,903,750**	**228,941,250**	**9.27%**
B.	**Use the Natural Environment Positively and Wisely**													
1.	Institutionalize community based management	271,000	0.43%	750,000	1.19%	1,021,000	1.61%	3,000,000	3,300,000	3,630,000	3,993,000	4,392,300	18,315,300	0.74%
2.	Promote and enhance biodiversity conservation	-	0.00%	1,500,000	2.37%	1,500,000	2.37%	4,500,000	4,950,000	5,445,000	5,989,500	6,588,450	27,472,950	1.11%
3.	Develop and implement guidelines for implementation and monitoring of district water security strategy	-	0.00%	-	0.00%	-	0.00%	2,500,000	2,750,000	3,025,000	3,327,500	3,660,250	15,262,750	0.62%
4.	Strengthen community based sustainable management of available forest resources, giving priority to degraded forest areas	-	0.00%	1,000,000	1.58%	1,000,000	1.58%	3,500,000	3,850,000	4,235,000	4,658,500	5,124,350	21,367,850	0.87%
5.	Improve the quality of rangelands	-	0.00%	600,000	0.95%	600,000	0.95%	3,500,000	3,850,000	4,235,000	4,658,500	5,124,350	21,367,850	0.87%
6.	Strengthen capacity of local organizations to keep Manang free from all forms of pollution	530,000	0.84%	600,000	0.95%	1,130,000	1.79%	15,000,000	16,500,000	18,150,000	19,965,000	21,961,500	91,576,500	3.71%
7.	Establish security and compensation mechanisms for wildlife depredation	-	0.00%	1,500,000	2.37%	1,500,000	2.37%	7,500,000	8,250,000	9,075,000	9,982,500	10,980,750	45,788,250	1.85%
8.	Strengthen local capacity for developing and implementing a biodiversity monitoring system		0.00%	350,000	0.55%	350,000	0.55%	3,000,000	3,300,000	3,630,000	3,993,000	4,392,300	18,315,300	0.74%
	Sub-total	**801,000**	**1.27%**	**6,300,000**	**9.97%**	**7,101,000**	**11.23%**	**42,500,000**	**46,750,000**	**51,425,000**	**56,567,500**	**62,224,250**	**259,466,750**	**10.51%**
C.	**Improve Access to Livelihood Options for the Poor, Marginalized Groups, Aged, Women and Children**													
1.	Make Manang "free from poverty and hunger" district	6,600,000	10.44%	1,000,000	1.58%	7,600,000	12.02%	18,500,000	20,350,000	22,385,000	24,623,500	27,085,850	112,944,350	4.57%
2.	Improve Manang's position in development indicators as set in MDGs	3,600,000	5.69%		0.00%	3,600,000	5.69%	25,000,000	27,500,000	30,250,000	33,275,000	36,602,500	152,627,500	6.18%
3.	Encourage and promote gainful self-employment in natural resources, tourism and other potential sectors	-	0.00%	450,000	0.71%	450,000	0.71%	35,000,000	38,500,000	42,350,000	46,585,000	51,243,500	213,678,500	8.65%
	Sub-total	**10,200,000**	**16.13%**	**1,450,000**	**2.29%**	**11,650,000**	**18.43%**	**78,500,000**	**86,350,000**	**94,985,000**	**104,483,500**	**114,931,850**	**479,250,350**	**19.41%**

Table 8.1: ***(continued)***

	Activities	Government	Gov.	NTNC	NTNC	Total	Total	For Five Years						
								Year 1	Year 2	Year 3	Year 4	Year 5	Total	Total (%)
D.	**Accelerate Growth in Productivity of Agriculture, Livestock and other related Economic Activities**													
1.	Promote productivity of crops such as barley, buckwheat and potatoes and livestock without increasing the work burden on women	1,000,000	1.58%	250,000	0.40%	1,250,000	1.98%	3,500,000	3,850,000	4,235,000	4,658,500	5,124,350	21,367,850	0.87%
2.	Promote the development of credit and marketing services	2,345,000	3.71%	350,000	0.55%	2,695,000	4.26%	9,500,000	10,450,000	11,495,000	12,644,500	13,908,950	57,998,450	2.35%
3.	Generate better awareness, skills, capacity and services for the development of environmentally sound high value organic agriculture and livestock products	5,000,000	7.91%	350,000	0.55%	5,350,000	8.46%	10,000,000	11,000,000	12,100,000	13,310,000	14,641,000	61,051,000	2.47%
4.	Undertake scientific and participatory research to identify and conserve globally important genetic resources of cereal crops	-	0.00%	-	0.00%	-	0.00%	8,500,000	9,350,000	10,285,000	11,313,500	12,444,850	51,893,350	2.10%
5.	Conduct EIA/IEE and establish local enterprises or factories based on milk products	-	0.00%	-	0.00%	-	0.00%	15,000,000	16,500,000	18,150,000	19,965,000	21,961,500	91,576,500	3.71%
	Sub-total	**8,345,000**	**13.20%**	**950,000**	**1.50%**	**9,295,000**	**14.70%**	**46,500,000**	**51,150,000**	**56,265,000**	**61,891,500**	**68,080,650**	**283,887,150**	**11.50%**
E.	**Promote Sustainable Tourism Focusing on Manang as a Unique Destination**													
1.	Identify and develop alternative trekking routes offering similar or better choices	-	0.00%	750,000	1.19%	750,000	1.19%	25,000,000	27,500,000	30,250,000	33,275,000	36,602,500	152,627,500	6.18%
2.	Encourage local - private sector and community groups to invest in tourist facilities	-	0.00%	250,000	0.40%	250,000	0.40%	13,000,000	14,300,000	15,730,000	17,303,000	19,033,300	79,366,300	3.21%
3.	Improve capacity for communications and information dissemination	-	0.00%	250,000	0.40%	250,000	0.40%	15,000,000	16,500,000	18,150,000	19,965,000	21,961,500	91,576,500	3.71%
	Sub-total	**-**	**0.00%**	**1,250,000**	**1.98%**	**1,250,000**	**1.98%**	**53,000,000**	**58,300,000**	**64,130,000**	**70,543,000**	**77,597,300**	**323,570,300**	**13.10%**
F.	**Manage Growing Settlements in an Environmentally-friendly Manner**													
1.	Maintain the urbanization and settlement growth in harmony with local social, environmental and cultural integrity	-	0.00%	-	0.00%	-	0.00%	20,000,000	22,000,000	24,200,000	26,620,000	29,282,000	122,102,000	4.94%
2.	Develop regulations and monitoring mechanism to maintain highest environmental standards in cultural landscapes	-	0.00%	-	0.00%	-	0.00%	3,500,000	3,850,000	4,235,000	4,658,500	5,124,350	21,367,850	0.87%
	Sub-total	**-**	**0.00%**	**-**	**0.00%**	**-**	**0.00%**	**23,500,000**	**25,850,000**	**28,435,000**	**31,278,500**	**34,406,350**	**143,469,850**	**5.81%**

Table 8.1: ***(continued)***

	Activities	Government	Gov.	NTNC	NTNC	Total	Total	For Five Years						
								Year 1	Year 2	Year 3	Year 4	Year 5	Total	Total (%)
G.	**Develop Basic Infrastructure and Services in an Environmentally-friendly Manner**													
1.	Integrate building and construction activities under the overall guidance of District Development Committee	4,600,000	7.28%	0.00	0.00%	4,600,000	7.28%	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	9,157,650	0.37%
2.	Complete the high standard environmentally sound road in the district	5,000,000	7.91%		0.00%	5,000,000	7.91%	-	-	-	-	-	-	
3.	Promote the development of hydro electric resources in the district in a socially desirable, economically viable and environmentally acceptable manner	1,600,000	2.53%		0.00%	1,600,000	2.53%	65,000,000	71,500,000	78,650,000	86,515,000	95,166,500	396,831,500	16.07%
4.	Provide incentives for development of alternative energy sources and use of fuel efficient technologies	1,200,000	1.90%		0.00%	1,200,000	1.90%	25,000,000	27,500,000	30,250,000	33,275,000	36,602,500	152,627,500	6.18%
5.	Improve access to piped drinking water and solid waste disposal system to the residents in the district	4,500,000	7.12%	500,000	0.79%	5,000,000	7.91%	15,000,000	16,500,000	18,150,000	19,965,000	21,961,500	91,576,500	3.71%
	Sub-total	**16,900,000**	**26.73%**	**500,000**	**0.79%**	**17,400,000**	**27.52%**	**106,500,000**	**117,150,000**	**128,865,000**	**141,751,500**	**155,926,650**	**650,193,150**	**26.33%**
H.	**Build Capacity of Local Organizations and Strengthen Partnerships with Community and other Organizations**													
1.	Encourage group formation in all aspects of local level planning, implementation and monitoring of Sustainable Development Plan activities	2,100,000	3.32%		0.00%	2,100,000	3.32%	2,000,000	2,200,000	2,420,000	2,662,000	2,928,200	12,210,200	0.49%
2.	Improve coordinating and monitoring capacity at the Ward and Village Development Committee levels	13,000,000	20.56%	200,000	0.32%	13,200,000	20.88%	3,500,000	3,850,000	4,235,000	4,658,500	5,124,350	21,367,850	0.87%
3.	Improve coordination, monitoring, evaluation and mobilization capacity in the different organs of the district government, especially District Development Committee	-	0.00%		0.00%	-	0.00%	1,000,000	1,100,000	1,210,000	1,331,000	1,464,100	6,105,100	0.25%
4.	Integrate NGO and other organizations to support sustainable district development plan	-	0.00%		0.00%	-	0.00%	1,500,000	1,650,000	1,815,000	1,996,500	2,196,150	9,157,650	0.37%
5.	Integrate private sector in sustainable development of the district	-	0.00%		0.00%	-	0.00%	8,500,000	9,350,000	10,285,000	11,313,500	12,444,850	51,893,350	2.10%
	Sub-total	**15,100,000**	**23.88%**	**200,000**	**0.32%**	**15,300,000**	**24.20%**	**16,500,000**	**18,150,000**	**19,965,000**	**21,961,500**	**24,157,650**	**100,734,150**	**4.08%**
	Grand Total	**51,346,000**	**81.22%**	**11,875,000**	**18.78%**	**63,221,000**	**100.00%**	**404,500,000**	**444,950,000**	**489,445,000**	**538,389,500**	**592,228,450**	**2,469,512,950**	**100.00%**

Fig. 8.2: Budget allocation by Plan Objectives

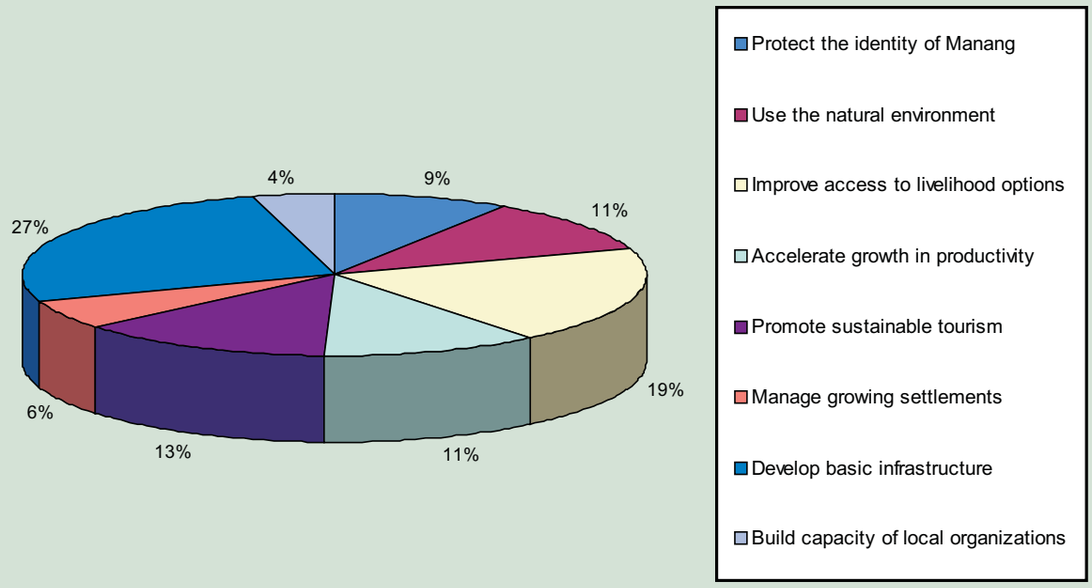
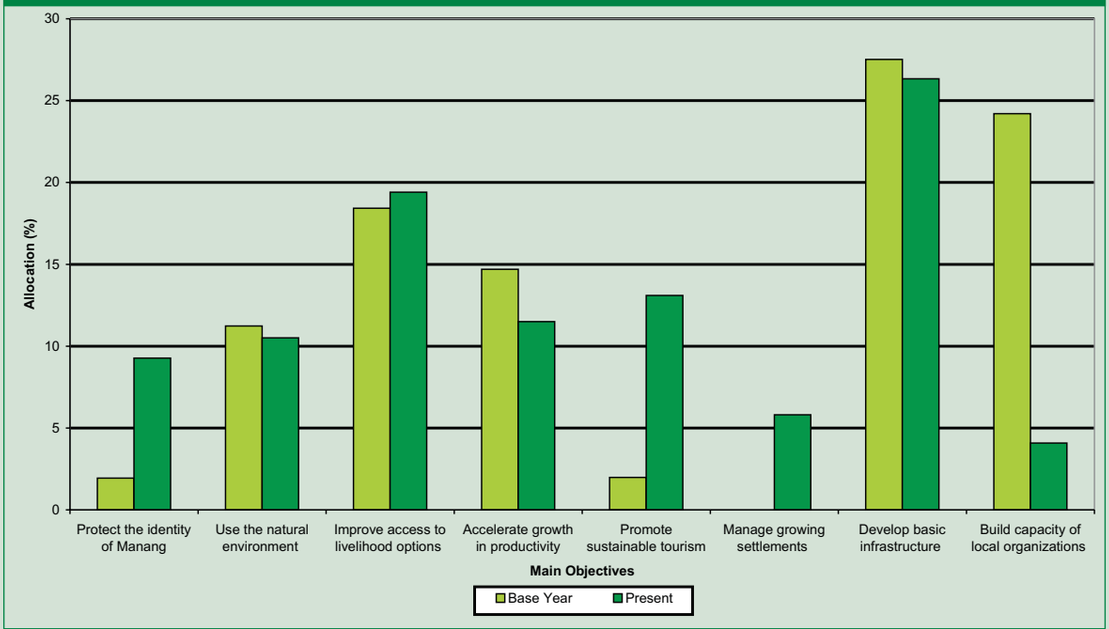


Fig. 8.3: Base year vs present allocation



8.2 Monitoring Plan

Monitoring is very critical to fulfil the goal and objectives of the Sustainable Development Plan of Manang district. By keeping close track of the progress in implementation of the proposed activities and their impacts, it is possible to determine the nature of changes in the livelihood of people, their access to resources, and opportunities, overall improvement in the quality and quantity of services available and the conditions of the environment. Monitoring on a regular basis helps policy makers and others to better address the priorities by identifying the prevailing gaps. At the level of a district like Manang, monitoring activities are quite limited at present and much of it is focused on sectoral targets and budget transactions with very little focus on the conditions of the people and the environment. While the former is important as part of the process monitoring efforts, there must be greater emphasis on the latter in the new monitoring system, if the goals of sustainable development are to be fulfilled.

The eight different objectives along with the resources and the institutional set up proposed for implementation must be seen as a minimum benchmark for improving the quality of life and the environment in Manang. It is important that these are not compromised and monitoring should be used as a powerful instrument to keep the plan on its track. Monitoring is a joint responsibility of all the organizations active in the implementation of the Plan. Under the institutional set up for implementation, different types of monitoring roles have been identified. Even in the Plan, there are proposals for baseline assessments, inventories, research and improvement in capacity of local organizations for better monitoring and evaluation. The Monitoring Plan given in *Table 8.2* identifies some of the major activities under each of the Plan objectives and broadly points out the nature of monitoring.

8.3 Preconditions for Successful Implementation of the Plan

(i) Commitment at the national level

The National Planning Commission, concerned ministries, central government organizations and NTNC are important organizations at the national level for the successful implementation of the Plan. The proposed activities need to be integrated with different national programmes. Adequate support needs to be provided for the proposed Plan activities. Clear indication of strong national support will also facilitate donor support for the Plan.

Commitment at the district and local levels

While local resource mobilization will be important, extensive institutional mobilization at different levels as discussed earlier will be more critical for the successful implementation of the Plan.

Table 8.2: Monitoring Plan of Manang's Sustainable Development Plan

MONITORING PLAN FOR FIVE YEARS	INDICATORS
OBJECTIVE 1: PROTECT AND PROMOTE THE IDENTITY OF MANANG	
• Support religious, cultural and community institutions	• Increasing number supported
• Development activities within proper guidelines	• Guideline document prepared and implemented
• Support monastic schools	• Increasing number supported
• Culture and conservation programmes in schools and the community	• Programmes prepared, number of schools supported to adopt it
• Document indigenous knowledge	• Documentation undertaken, prepared and made available
• Generate awareness about Manang	• National awareness campaigns through various media outlets
• Get national recognition of valuable cultural resources of Manang	• Acquire government declaration
• Support inventory (photographic documentation, micro films, listing, etc.) of all monuments, sites, artefacts, and valuables	• Prepare inventory
• Phase-wise restoration and maintenance plans of important historical sites, cultural and religious monuments in monasteries	• Number of restorations and maintenance undertaken
OBJECTIVE 2: USE THE NATURAL ENVIRONMENT POSITIVELY AND WISELY	
• Increase capacity of local organizations	• Number of training and support to local organizations
• Protect biodiversity hotspots and environmentally-sensitive areas	• Areas identified/plans prepared and implemented
• Collaborate with local stakeholders to implement conservation management plan	• Organize meetings with stakeholders about the plan
• Inventory of different ecological landscapes	• Select landscapes and prepare inventory
• Options for improving economic utilization of NTFPs and MAPs	• Identify NTFPs/MAPs and prepare action programme
• User-friendly biodiversity database and community monitoring	• Database system developed and placed in organization
• Preserve important components of indigenous knowledge	• Guideline prepared and disseminated
• Implement ACAP Code of Conduct	• Awareness enhanced and implementation encouraged
• Potentials of using abandoned farmland	• Feasibility study undertaken
• Implement and monitor district water security strategy	• Strategy prepared, phasing identified and resource mobilized
• Community-based sustainable management of forest	• Increasing number of CBOs supported
• Improve the quality of rangelands	• Feasibility study undertaken, feasible components implemented
• Free from all biological/non-biological forms of pollution	• Undertake district level assessment of pollution and implement appropriate action
• Establish security and compensation mechanisms	• Develop losses reporting, validating and compensation systems and put into operation
• Capacity development and implementation of biodiversity monitoring system	• Training and support for the work • Incorporate monitoring plan at the district level plan
OBJECTIVE 3: IMPROVE ACCESS TO LIVELIHOOD OPTIONS	
• Develop food security strategy	• District level strategy prepared, discussed and put into practice
• Better distribution system in remote parts	• Discuss current distribution challenges and implement feasible options
• Undertake Food for Work programme	• Number of programmes undertaken

Table 8.2: Monitoring Plan of Manang *(continued)*

MONITORING PLAN FOR FIVE YEARS	INDICATORS
• Encourage sponsors of food distribution for disadvantaged groups	• Resources generated for distribution
• Identify groups vulnerable to impacts of various natural disasters	• Number, location and adoption of mitigation programmes
• District poverty monitoring and assessment	• Poverty monitoring framework developed and implemented
• Three-Year Plan targets in poverty reduction	• Additional poverty monitoring based on Three Year Plan
• Millennium Development Goals Targets	• Integrate with poverty monitoring framework
• Promote gainful self-employment	• Skill generation, credit support, marketing and training
• Improve access of local people to resources and services	• Expand credit and other services in rural areas
• Promote decentralized recruitment processes	• Number of people hired locally in government jobs
OBJECTIVE 4: ACCELERATE GROWTH IN PRODUCTIVITY OF DIFFERENT SECTORS	
• Productivity of traditional cereal and non cereal crops	• Undertake research trials on farmer fields, identify better options and promote farmer to farmer extension programmes
• Reduce the drudgery of farm work burden of women better	• Identify specific technologies, organize trials and promote adoption of options
• Develop high value cereal and non cereal crops, including livestock products	• Undertake research trials on fields and promote farmer to farmer extension programmes
• Monitor crops, non-crops and livestock production and productivity	• Develop and share reports on research findings
• Encourage formation of groups and cooperatives	• Number of groups formed
• Generate awareness of environmentally safe products	• Undertake local meetings to share environmental guidelines
• Promote awareness of special products of Manang	• Identify products and promote locally, nationally and regionally
• Organize consultation of farmers and pastoralists, both women and men	• Number of meetings and number of women participants
• Organize farmer visits, including women farmers, to other similar environment experiencing high value crop production, new marketing linkages and institutional changes	• Number of visits and number of women involved
• Implementation of the training packages	• Number of training, number of training of women farmers
• Undertake scientific and participatory research	• Development of research reports
• Implement EIA/IEE	• Evaluation of measures undertaken
OBJECTIVE 5: PROMOTE SUSTAINABLE TOURISM FOCUSING ON MANANG AS A UNIQUE DESTINATION	
• Identify and develop alternative trekking routes	• Number of new routes identified and promoted
• Promote village tourism	• Number of villages selected
• Encourage banks and financial institutions to support private and community groups to invest	• Amount of resources available for investment
• Control haphazard development of settlements and tourism facilities	• Enforcement of guidelines
• Improve capacity for communication and information dissemination	• Number of training in tourism related activities
• Train local people as tourism entrepreneurs	• Number of training
• Develop monitoring system	• Prepare monitoring system and place in appropriate organization
• Study the carrying capacity	• Study the report, organise meetings to discuss its findings

Table 8.2: Monitoring Plan of Manang *(continued)*

MONITORING PLAN FOR FIVE YEARS	INDICATORS
OBJECTIVE 6: MANAGE GROWING SETTLEMENTS IN AN ENVIRONMENTALLY-FRIENDLY MANNER	
• Develop building and housing codes	• Documentation of codes, dissemination and adoption for enforcement
• Specify minimum facilities for settlements, especially around hotspots and tourist zones	• List of facilities identified
• Promote land use zoning	• Zoning guidelines prepared, discussed and enforced
• Develop settlement plans	• Number of plans prepared
• Reduce vulnerability of settlements in risk prone areas	• Study risks to settlements and mitigation plans discussed
• Implement participatory monitoring mechanism	• Systems developed, shared and use encouraged
• Enhance capacity of CAMC and other local institutions	• Number of training programmes
OBJECTIVE 7: DEVELOP BASIC INFRASTRUCTURE AND SERVICES IN AN ENVIRONMENTALLY-FRIENDLY MANNER	
• Prepare and implement district infrastructure development strategic plan	• Strategic plan document shared for implementation
• District monitoring system for ensuring that adequate resources are allocated	• Amount of resources made available
• Community involvement in the delivery of different public services	• Number involved
• Complete the high standard environmentally sound road connecting Beshisahar and Chame	• Completion of the road
• Support the building of other feeder roads	• Feeder road network plan prepared, implementation discussed
• Develop hydro electricity resources	• Feasible projects and investors identified
• Develop alternative energy sources	• Potential sources identified
• Encourage sustainable harvesting of fuel wood	• Community-based measures to reduce fire wood
• Improve access to piped drinking water	• Number of projects
• Improve solid waste disposal system	• Number of projects
OBJECTIVE 8: BUILD CAPACITY OF LOCAL ORGANIZATIONS AND STRENGTHEN PARTNERSHIPS	
• Encourage group formation in all aspects of local level planning, implementation and monitoring of the Sustainable Development Plan activities	• Number of groups
• Improve coordinating and monitoring capacity at the Ward and Village Development Committee levels	• Training to improve capacity
• Undertake capacity building activities for the overall improvement of district and lower level capacity for organizing and undertaking sustainable development activities	• Training to improve capacity
• Mobilize resources from all potential sources for sustainable development	• Amount of resources mobilized
• Integrate NGOs and other organizations to support sustainable district development plan	• Number of organizations participating
• Integrate private sector in sustainable development	• Extent of private sector resources

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ANNEXES

Table 1: MDG status of Nepal and Manang district

MDG Targets		Nepal			Manang
		1990	2015	2005	Current status
1a.	% of population below $ 1 per day (PPP)	33.5	17	24.1	
1b.	% of population below national poverty line	42	21	31	21.2
2a.	% of population below minimum level of dietary energy consumption	49	25	47^	55.2
2b.	% of underweight children under 5 years of age	57	29	53^	24.0
2c.	% of stunted children ages 6—59 months (>-2 SD)	60	30	55^	59.5
3a.	Net enrollment rate in primary school education	64	100	84	86.0
3b.	% of pupils that start grade 1 and reach grade 5	38	100	76	29
3c.	Literacy rate of 15—24 years	49.6	100	73	52.2
4a.	Ratio of girls to boys at primary education	0.56	1	0.86	1.22
4b.	Ratio of girls to boys at secondary education	0.43	1	0.82	0.81
4c.	Ratio of women to men at tertiary level of education	0.32	1	0.28^	
4d.	Ratio of literate men to women from 15—24 years	0.48	1	0.73	
4e.	Share of women in wage employment in non-agricultural sector	18.9	–	17.7	46.0
4f.	Proportion of seats held by women in House of Representatives	3.4	–	5.8	0.0
5a.	Infant mortality rate (per 1000)	108	34	61	88.46
5b.	Under 5 mortality rate (per 1000)	162	54	82	63.2
5c.	Proportion of under 5 immunized against measels	42	> 90	85	
6a.	Maternal mortality ratio (per 100,000 live births)	850 or 515	213/134	415^	
6b.	% of deliveries attended by health care providers	7	60	20	
6c.	Contraceptive prevalence rate	24	67	39^	70.09
7a.	% of HIV prevalence rate among 15—49 years age	–	–	0.5	
7b.	Contraceptive prevalence rate, including condom	24	–	39^	70.09
8a.	Number of malaria cases per 100,000 people	115	–	78	–
8b.	Number of tuberculosis cases per 100,000 people	92.3 (1995)	–	280	
9a.	% of area under forest	37	–	29~	
9b.	Area protected to maintain biological diversity (sq. km)	10,948	–	28,585.70	
9c.	Energy use per unit of GDP (TOE/mRs)	34.8	–	29.6	–
9d.	Proportion of people using wood as their main fuel (%)	75	–	69.1	100
9e.	Commercial Energy/GDP (TOE/mRs)	1.44	–	3.64	–
10a.	% of population with sustainable access to drinking water supply	46	73	81	93.36
10b.	% of population with sustainable access to improved sanitation	6	53	39	35.7

Source: *The data are for the year 2000. The national level data were obtained from UNDP Report on MDGs (2006). District level data were obtained from various sources, and it had many inconsistencies.*

Table 2: Rank of Manang district in various development indicators as compared to other districts of Nepal. ***(Rank 1 represents best situation)***

	Manang
Per Capita Income (US $) (Nepal=240)	504 (2)
Rank based on overall Composite Development Index	10
Rank based on Poverty Deprivation Index	25
Rank based on Socio-economic and Infrastructural Development Index	10
Rank based on Women's Empowerment Index	5
Rank based on Child Deprivation Index	1
Child Illiteracy Rate (%)	3.31 (1)
Rank based on Gender Discrimination Index	1
Adult Gender Imbalance Ratio in Literary Status	0.68 (5)
Adult Gender Imbalance Ratio in Non-agricultural Occupation	0.46 (2)
Contraceptive Prevalence Rate (%)	70.09 (4)
Drinking Water Coverage (%)	93.51 (9)
Toilet Facility (%)	35.94 (45)
Livestock per Farm Household	20.05 (2)
Per Capita Development Budget Expenditure (Rs.)	4796 (3)
Overall Literacy Rate	60.45 (18)
(%) Share of Girls Enrolled at Primary Level	51.16 (3)

Source: *Districts of Nepal. Indicators of Development (update 2003). Kathmandu: ICIMOD, GoN, SNV. December 2003.*

Table 3: Food insecurity in Manang district

	Nepal	Manang
Prevalence rate of calorie intake (below threshold (2709 Kcal).	0.352 – 0.398	0.552
Prevalence rate of stunting (0—59 months age)	0.504	0.595
Prevalence rate of severe stunting (")	0.206	0.283
Prevalence rate of underweight (")	0.452	0.240
Prevalence rate of severe underweight (")	0.146	0.050
Prevalence rate of wasting (")	0.096	0.015
Prevalence rate of severe wasting (")	0.009	0.001

Prevalence rate: *Percentage of population having that characteristic in the total population.*
Source: *CBS and WFP, 2006: Small Area Estimation of Poverty, Calorie Intake and Malnutrition in Nepal. Kathmandu: CBS and WFP.*

Table 4: Human development situation of Manang district as compared to Nepal. Figures in brackets represent rank among 75 districts
(Rank 1 represents best situation)

	Nepal	Manang
Human Development Index (HDI)	**0.471**	**0.502 (15)**
Life expectancy at birth	60.98	57.03
Adult literacy	48.6	52.2
Mean years of schooling	2.75	3.17
GDP per capita (PPP US $)	1310	2746
Human Poverty Index (HPI)	**39.4**	**37.9 (21)**
Chronic malnourishment among children (under 5 years)	50.5	63.2
Adult illiteracy rate	51.4	52.2
Proportion of population with life expectancy less than 40 years	17.74	22.69
Population without access to safe water	20.48	15.66
Gender Discrimination Index (GDI)	**0.452**	**0.495 (13)**
Life expectancy (female)	61.5	57.26
Life expectancy (male)	60.5	56.58
Adult literacy (female)	34.9	33.4
Adult literacy (male)	62.7	58.9
Mean years of schooling (female)	1.95	1.78
Mean years of schooling (male)	3.56	3.39
Estimated earned income (female)	0.345	0.495
Estimated earned income (male)	0.485	0.562
Gender Empowerment Index (GMI)	**0.391**	**0.490 (2)**
Women's participation in local election (%)	19.33	37.1
Women in professional jobs	18.75	18.34
Women in administrative jobs	12.71	15.02
Women's share in income	0.302	0.383

Source: *Human Development Report (2004), UNDP, Kathmandu*

Table 5: Threatened bird species recorded in Manang district

Common Name	Scientific Name	NRDB Threat Category	CITES Appendices
Tibetan snowcock	*Tetragallus tibetanus*		I
Golden eagle	*Aquila chrysaetoa*	S	II
Bearded vulture	*Gypaetus barbatus*		II

Legend: *S = susceptible; I, II, = CITES Appendices*

Table 6: Threatened mammal species recorded in Manang district

Common Name	Scientific Name	NPWC Act, (1973)	NRDB (1995)	IUCN	CITES
Snow leopard	*Uncia uncia*	P	E	E	I
Forest leopard	*Panthera pardus*		S		I
Leopard cat	*Felis bengalensis*	P	V	LR	I
Grey wolf	*Canis lupus*	P	V	V	I
Dhole	*Cuon alpinus*		V	V	II
Bengal fox	*Vulpes bengalensis*			DD	III
Red fox	*Vulpes vulpes*		S		III
Jackal	*Canis aureus*				III
Yellow throated marten	*Martes flavigula*				III
Stone marten	*Martes foina*		S	LR	III
Himalayan black bear	*Ailurus fulgens*	P	E	E	I
Himalayan weasel	*Ursus thibetanus*		S	V	I
Ghoral	*Mustela sibirica*				III
Himalayan serow	*Naemorhedus goral*		S	V	I
Blue sheep	*Naemorhedus sumatraensis Pseudois nayaur*				
Himalayan musk deer	*Moschus chrysogaster*	P	E	E	I
Hanuman langur	*Semnopithecus entellus*		S		I
Rhesus monkey	*Macaca mulatto*		S	LR	I

Legend: *C=critical; DD=data deficient; E=endangered; I (IUCN)=indeterminate; IK=insufficiently known; LR=lower risk; P=protected; S=susceptible; V=vulnerable; CITES (I, II, III)=Appendices*

Table 7: Demographic features of Manang district

	1981	1991	2001	2006*	2011*	2036*
Total Population	7021	5363	9587	12,847	17,214	24,961
Male	3543	2789	5034	6406	8175	11,854
Female	3478	2574	4553	6441	9039	13,107
Male:Female Ratio	1.02	1.08	1.11	1.05	1.02	1.00
Total Households	1498	1272	1776	2500	3600	5500
Average Household Size	4.7	4.2	5.4	5.14	4.78	4.54
Population Growth Rate (%/year)		-2.66	5.98	5.98	5.98	1.5

**** projected***

Table 8: Population in different VDCs of Manang district

Population according to VDCs	2001	%
Bhraka	996	10.39
Chame	1204	12.56
Dharapani	1005	10.48
Phoo	192	2.00
Ghyaru	515	5.37
Khangsar	557	5.81
Manang	1299	13.55
Nar	398	4.15
Ngawal	516	5.38
Pisang	707	7.37
Bagarchhap	554	5.78
Tanki Manang	944	9.85
Thoche	575	6.00
Offices	125	1.30
Total	**9587**	**100.00**

Table 9: List of 57 endemic species of flowering plants of Nepal found in Annapurna Conservation Area

Family	*Species*
Balsaminaceae	*Impatiens scullyi*
Berberidaceae	*Berberis mucrifolia*
Boraginaceae	*Maharanga wallichiana*
Campanulaceae	*Codonopsis nepalensis*
Caryophyllaceae	*Arenaria mukerjeeana, Arenaria paramelanandra, Silene helleboriflora, Silene holosteifolia, Silene vautierae, Stellaria congestiflora*
Compositae	*Cremanthodium nepalense, Cremanthodium purpureifolium, Saussurea spicata, Taraxacum nepalense*
Crassulaceae	*Rhodiola nepalica, Rosularia marnieri, Sedum pseudo-multicaule*
Cruciferae	*Glaribraya lowndesii*
Cyperaceae	*Carex rufulistolon, Kobresia esbirajbhandarii, Kobresia fissiglumis, Kobresia mallae*
Elaeagnaceae	*Elaeagnus tricholepis*
Ericaceae	*Rhododendron lowndesii*
Flacourtiaceae	*Homalium napaulense*
Gramineae	*Poa kanaii, Poa mustangensis*
Labiatae	*Lamium tuberosum, Micromeria nepalensis*
Leguminosae	*Astragalus nakaoi, Caragana campanulata, Hedysarum manaslense*
Orchidaceae	*Oberonia nepalensis*
Papaveraceae	*Corydalis megacalyx, Meconopsis regia, Meconopsis taylorii*
Polygonaceae	*Fallopia filipes*
Primulaceae	*Primula sharmae*
Ranunculaceae	*Clematis bracteolata, Delphinium himalayai*
Rosaceae	*Sibbaldia minutissima*
Salicaceae	*Salix eriostachya*
Saxifragaceae	*Saxifraga alpigena, Saxifraga cinerea, Saxifraga hypostoma, Saxifraga lowndesii, Saxifraga namdoensis, Saxifraga neopropagulifera, Saxifraga poluninana, Saxifraga staintonii, Saxifraga williamsii*
Scrophulariaceae	*Pedicularis annapurnensis, Pedicularis breviscaposa, Pedicularis chamissonoides, Pedicularis sectifolia, Pedicularis wallichii*
Verbenaceae	*Caryopteris nepalensis*

Table 10: Distribution of poverty in some selected VDCs of Manang district

VDCs	Total households (2001)	Very poor (%)	Poor (%)	Medium (%)	Wealthy (%)
Bhraka	190	15.09	39.62	43.40	1.89
Chame	278	44.68	26.60	23.40	5.32
Dharapani	176	17.96	28.74	49.70	3.60
Phoo	39	6.67	70.0	23.33	–
Khangsar	103	27.66	46.81	25.53	–
Nar	63	5.00	16.67	78.33	–
Pisang	142	30.77	32.05	19.24	17.94
Thoche	110	22.37	40.79	34.21	2.63

Source: *i. Census reports of different years; ii. District Profile, Manang*

Table 11: List of participants interacted in Chame VDC, Manang district

S.N.	Name of Participants	Designation
1.	Pemba Lama	VDC secretary
2.	Yagya Prasad Ghale	CAMC secretary
3.	Tassi Thaddu Lama	Construction Entrepreneurs' Association/FMSC chairperson
4.	Pem Dorje Lama	CAMC member
5.	Ram Bahadur Ghale	Former executive chairperson
6.	Baburam Gurung	CAMC member
7.	Lila Bahadur Gurung	FMSC member
8.	Bin Ghale	CAMC member
9.	Choyu Lakpa Lama	CAMC member
10.	Nurpu Lama	Social worker
11.	B.P. Lama	TEAM secretary
12.	Khadka Bahadur Pariyar	Chairperson, *Dalit* Association
13.	Syangdo Bista	FMSC member
14.	Sonam Lama	Social worker
15.	Kuisang Lama	Social worker
16.	Dudhraj Gurung	CAMC member
17.	Tej Ghale	Social worker
18.	Man Ghale	Social worker
19.	Sthir Jang Gurung	Social worker
20.	Rarpu Lama	Member, *Ama Samuha*
21.	Kharimaya Gurung	Vice chairperson (Chame Youth Group)
22.	Chugda Lama	Social worker
23.	Furchjum Lama	Member, *Ama Samuha*
24.	Sushila Lama	Member, Chame Youth Group
25.	Tshering Buti Shrestha	Hotel entrepreneur

Table 12: Impacts on life and livelihood sources in Manang district

Changes in temperature, wind and precipitation	• Winters are less cold and frosty • The river valleys of Kali Gandaki are getting windier • Less snowfall in winter • Increased rain and snowfall after winter • Unusually intense summer rainfall
Weather hazards	• Increased frequency of avalanches, flash floods, windstorms and hailstorms • Rainfall patterns are getting more erratic with long droughts and sudden heavy rains • More loss of life and property from harsh weather incidents
Vegetation	• The altitude of the tree line is rising • Grasslands are less green because reduced snowfall results in moisture deficiencies and less grass production
Water supply and housing	• Reduced water flow in local streams and springs • Unpredictable fluctuation in flow levels and timing of seasonal spring recharging • More roof leakage and wall erosion in traditional mud houses • Water supply is a major problem leading to the abandonment of some old settlements in Manang
Agriculture	• Bigger tasty apples at higher altitudes where it used to be too cold for apple farming; apple orchards and nursery farms are emerging • Successful farming of cabbage, cauliflower, cucumber, chilli and tomatoes in open gradens (without a greenhouse)
Lifestyle/business	• Older people find their villages more comfortable due to warmer winters • Tourism businesses are more profitable due to longer drought periods during post monsoon months • Agricultural businesses suffer due to reduced irrigation and variable precipitation patterns

Source: *Based on personal observations and communications with local residents and development workers in Manang district between December 2003 and March 2005.*

SUSTAINABLE DEVELOPMENT PLAN

MANANG

(2008—2013)

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