

Regional Consultation on Conservation of the Kanchanjunga Mountain Ecosystem

Editors

Ajay Rastogi

Pei Shengji

Devendra Amatya

World Wildlife Fund (WWF) Nepal Programme
and
International Centre for Integrated Mountain Development (ICIMOD)

Regional Consultation on Conservation of the Kanchanjunga Mountain Ecosystem

Editors

Ajay Rastogi
Pei Shengji
Devendra Amatya

World Wildlife Fund (WWF) Nepal Programme
and
International Centre for Integrated Mountain Development (ICIMOD)
October 1997

Copyright © 1997
International Centre for Integrated Mountain Development
All rights reserved

Cover photo: Janu Peak, Kanchanjunga Area (*Devendra Amatya*)

Published by
International Centre for Integrated Mountain Development
G.P.O. Box 3226,
Kathmandu, Nepal

ISBN 92 9115 709 0

Typesetting at ICIMOD Publications' Unit
Layout by D.R. Maharjan
Edited by G. Rana and A. Pandey
Cover page A.K. Thaku

The views and interpretations in this paper are those of the author(s). They are not attributable to the International Centre for Integrated Mountain Development (ICIMOD) and do not imply the expression of any opinion concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

FOREWORD

The eastern Himalayas are one of the global 'hotspots' for biodiversity. Characterised by a diverse and unique flora and fauna, this area faces pressing conservation and development challenges. The International Centre for Integrated Mountain Development (ICIMOD) seeks to address these challenges through regional collaboration and a multidisciplinary approach. Transboundary cooperation is the key to effective management and sustained conservation of areas that lie along the international borders. The Kanchanjunga massif straddles the Tibetan Autonomous Region (TAR) of the People's Republic of China to the north, India to the east, and Nepal to the south and west. Thus, the protection of the Kanchanjunga Mountain System calls for effective cooperation between the official agencies of these three countries. ICIMOD organised and facilitated this meeting of experts and officials from China, India, and Nepal in close collaboration with WWF Nepal Programme, which also arranged for its funding.

The meeting clearly brought out that the three nations currently have different degrees of protection and legal categories of land-use systems. On the Indian side, it is a national park, which is likely to be further expanded and declared a Biosphere Reserve. In Nepal, it is a proposed Conservation Area and, in TAR currently, there are no plans to consign any special status to the area as it is quite remote, fairly inaccessible, and naturally protected. Similarly, the degree of information available on the biological diversity and sociocultural aspects is highly variable. There are certain strengths and weaknesses on each side and many gaps need to be filled for effective protection of the Kanchanjunga Mountain System as a whole. The meeting resulted in convening a working group to develop a common framework for sharing information and providing technical assistance to increase the prospects of developing and implementing a long-term conservation action plan for the region. The officials from the countries deliberated on accepting and sharing the responsibilities and consensually decided that common agreements should be operationalised within a specified time frame.

The World Wide Fund for Nature (WWF), also known as World Wildlife Fund in the USA and Canada, was well represented at the meeting with staff from the international as well as the regional offices, besides representatives from the WWF India. WWF, together with other international and regional organisations, such as the SNV and the Mountain Institute, has taken the lead in providing the necessary technical assistance to the three countries. ICIMOD with its regional mandate would be happy to provide support by fostering greater collaboration between the member countries. I would like to thank the officials and experts from the three countries and the international non-government organisations involved in this meeting and in the follow-up. I look forward to further action following this pioneering initiative in transboundary cooperation, as I see this as a beginning towards development of a common agenda for sustainable development and conservation of this unique ecosystem.

Egbert Pelinck
Director General

The Kanchanjunga massif straddles Nepal in the east, India to the west, and the Tibetan Autonomous Region of China to the north. This mountain system is characterised by rich biological and cultural diversity. For effective conservation and development of the Kanchanjunga Mountain System, it is important that the three countries collaborate in drawing up a common vision and a long-term action plan. In order to facilitate this important process of regional collaboration, ICIMOD organised this meeting with the active involvement and support of the World Wildlife Fund Nepal Programme in Kathmandu from March 31 to April 2, 1997.

The participants at the meeting were comprised of government officials from the Department of Forests/Wildlife from the three nations. They presented overviews on the status of the Kanchanjunga area in their respective countries. Conservation experts, representing international non-government organisations actively involved in the region, were present, and they facilitated an exchange of ideas and information by providing thematic technical reports. The follow-up discussions centred around development of a common framework for three key aspects: (i) biodiversity assessment and monitoring; (ii) sharing information and management; and (iii) sharing conservation benefits with local people. Deliberations on these three key aspects led to a set of recommendations and a follow-up action plan to be jointly pursued in future.

Contents

INAUGURATION	3
OVERVIEW OF THE KANCHANJUNGA AREA, NEPAL	7
Introduction	7
Challenges and Threats	8
<i>Forest Degradation</i>	8
<i>Slash and Burn Agriculture</i>	8
<i>Lack of Trained and Equipped Natural Resource Managers</i>	8
<i>Lack of Integration between Local Resource Users and Central Authorities</i> ..	8
<i>Inadequate Physical Infrastructure</i>	8
<i>Lack of Social Infrastructure</i>	8
<i>Lack of Information on Kanchanjunga's Flora and Fauna</i>	9
<i>Overgrazing of Rangelands</i>	9
<i>Incursions into Habitat and Poaching of Threatened Wildlife</i>	9
<i>Inadequacy of Tourism Infrastructure</i>	9
<i>Emigration and Cultural Decline</i>	9
<i>Transboundary Conservation</i>	10
Priority Areas for Conservation	10
<i>Amjilhasa - Khambachen</i>	10
<i>Ghunsa - Mirgin La</i>	10
<i>Ramje - Tseram</i>	10
<i>Deorali Danda - Amje Khola</i>	11
<i>Olangchung Gola - Yangma</i>	11
References	11
Discussion	11
OVERVIEW OF KANCHANJUNGA AREA, SIKKIM	13
Ecological and Wildlife Background of the Sikkim Mountains	13
The Kanchanjunga (High Altitude) National Park, Sikkim	13
<i>History</i>	13
<i>Situation</i>	14
<i>Area</i>	14
<i>Status of Land</i>	14
Flora, Fauna, and Avifauna	14
<i>Flora</i>	14
<i>Fauna</i>	15
<i>Avifauna</i>	15
Management Programmes	15
<i>Enforcement and Anti-Poaching Operations</i>	15
<i>Public Participation</i>	16
<i>Staff Amenities</i>	16
<i>Infrastructure</i>	16
<i>Eco-Development Programmes</i>	16
<i>Park Boundary Demarcation</i>	16
<i>Research and Monitoring</i>	16
<i>Regulation of Tourism</i>	16
Transboundary Grazing	17
The Trans-Himalayan Zone	18
Indo-Nepal-Tibet (China) Watershed	19
Sikkim Transboundary Trekking Route	19
Kanchanjunga Biosphere Reserve	19
Discussion	20

OVERVIEW OF THE KANCHANJUNGA REGION IN THE TIBETAN AUTONOMOUS

REGION OF CHINA	23
Introduction	23
Management	23
Objective	24
International Collaboration	24
Demarcation	24
Education	24
Primary Health Care	24
Training of Staff	24
Nursery	25
Immediate Objectives	25
Dinggye District	25
The Future Plans of QNP	25
Future Development of Areas of Interest	26
Training and Education Goals	26
Practical Field Models	26
Policy and Research Appraisal and Development	26
Management Department Skills' Development	27
Discussion	27
Chairperson's Remarks	28

A BRIEF ACCOUNT OF THE VEGETATION AND FLORA OF THE KANCHANJUNGA

CONSERVATION AREA	31
Introduction	31
The Kanchanjunga Conservation Area	31
Vegetation	32
Subtropical Bioclimatic Belt (1,000 - 2,000m)	32
Temperate Bioclimatic Belt (2,000 - 3,000m)	33
Sub-alpine Bioclimatic Belt (3,000 - 4,000m)	33
Alpine Bioclimatic Belt (above 4,000m)	34
Flora	34
Endangered and Endemic Species	34
Exploitation of Plant Resources	35
Conclusion and Recommendations	35
References	36

A REPORT ON WILDLIFE ISSUES IN THE KANCHANJUNGA REGION

Background	37
Wildlife Assessment	37
Agricultural Area	37
Hardwood	37
Conifers	38
Shrubs	38
Grazing Area	38
Barren Land	39
Assessment of Birds	39
Wildlife Conservation Issues	40
Crop Damage	40
Livestock Depredation	40
Overgrazing	40
Hunting	41
Tourism	42
Inventory and Baseline Data	43
References	43
Attachment to Paper	44

Field Visit in September 1994	44
Field Visit in April 1994	44
Discussion	44
SOCIOECONOMIC ISSUES RELATED TO CONSERVATION OF THE KANCHANJUNGA	
MOUNTAIN ECOSYSTEM	45
Kanchanjunga National Park in Sikkim	45
Socioeconomic Status	46
Conservation Concerns	47
Conservation Efforts	47
Transboundary Issues	48
Discussion	48
THE MENRIS TAPLEJUNG DATABASE	55
Presentation of Maps	56
Discussion	56
TRANSBOUNDARY WILDLIFE TRADE ISSUES	67
Slide Show on Traded Animals	69
Discussion	70
Remarks from Sikkim	71
Discussion	72
Remarks from India	73
Remarks from Nepal	74
Discussion	76
RECOMMENDATIONS	83
CONCLUDING REMARKS	87
Mr. Egbert Pelinck, Director General, ICIMOD	87
Mr. Mingma Norbu Sherpa, Country Representative, WWF Nepal/Bhutan Programme	89
Dr. Eklavya Sharma, Scientist in-Charge, G.B. Pant Institute for Himalayan Environment and Development, Sikkim Unit, Sikkim	90
Chairperson's Remarks	91
ANNEXES	93
Inaugural Address	
Welcome Address	
Introduction to the Workshop	
Introduction to the Exhibition	
Programme of the Workshop	
List of Participants	

Day One

Inaugural Session

INAUGURATION

The inaugural session of the 'Regional Consultation on Conservation of the Kanchanjunga Mountain Ecosystem' was held at the Russian Cultural Centre in Kathmandu. Alongside, a photographic exhibition on the Indian Himalayas and the Trans-Himalayas was jointly presented by the British Council, Delhi, and ICIMOD.

The inauguration and the inaugural address were by the Hon. Dr. Prakash Chandra Lohani, the Minister for Foreign Affairs of His Majesty's Government of Nepal. In his address, Dr. Lohani touched upon the absence of mountain issues from global concerns in the past and the uniqueness of the Hindu Kush-Himalayas amongst mountain environments. He observed that ICIMOD was established at a time when the mountains were rarely heard of or thought of in global fora. Dr. Lohani remarked that there must be much wealth in the mountains that we had not heard about or seen. The Hon. Minister mentioned the value of ICIMOD workshops in bringing together participants from all over the region for sharing their knowledge and views and learning from each other. Dr. Lohani stated that he was happy

to know that the Kanchanjunga Ecosystem was now receiving the urgent attention it merited.

The inaugural address was followed by a welcome address by Mr. Egbert Pelinck, Director General of ICIMOD. Mr. Pelinck welcomed the participants on behalf of WWF-Nepal, the British Council, and ICIMOD. Mr. Pelinck, in his welcome address, spoke of the different types of expertise needed for ecosystem management. He stressed the importance of ensuring the well-being of the local people in these ecosystems. He also highlighted some of the challenges of transboundary ecosystem management. The challenges as outlined in this address are:

- a) what we know about the boundaries of the different sub-ecosystems and whether or not all countries used the same criteria;
- b) the legal status and land-use systems of the sub-ecosystems, the status of legal and illegal transboundary resource exploitation, human migration, and the affects of these on conservation; and
- c) ways to promote regional collaboration within an agreed framework

of the unique Kanchanjunga ecosystem.

Following the welcome address, Mr. Mingma Norbu Sherpa, Head, WWF Nepal Programme, introduced the workshop to the participants. Mr. Sherpa noted that the workshop presented a unique opportunity for joint collaboration in conservation. He described the unique environmental and cultural characteristics of the eastern Himalayan area; and this area was one of the ten global biological hotspot sites. The Kanchanjunga ecosystem was "home to endangered species of wildlife, an outstanding diversity in vegetation, and a fascinating assemblage of ethnic groups." Mr. Sherpa also went over the history of the dialogues and meetings that had taken place in order to arrive at a means of conserving the area. He stated that transboundary conservation was not new to Nepal and that appreciable efforts had been made by the governments of Nepal and China in this respect. In closing, Mr. Sherpa stated that the workshop had been convened to discuss a regional approach to conservation and development by bringing together professionals and policy-makers from China, India, and Nepal. The three-day deliberations were to cover topics of mutual interest such as safe-guarding biodiversity and improving the socioeconomic conditions of the local people.

Ms. Sarah Ewans, Director of the British Council, Kathmandu, introduced the exhibition. Ms. Ewans stated that the British Council was established to create an enduring understanding and appreciation of British thought, experience, and achievement through a broad spectrum of fields, viz., education, science and technology (including environment), and the arts. The British Council in India, which had put up the exhibition, had been established in 1948. Ms. Ewans described the work

of the British Council in training and exchanges of professionals, as well as sponsoring conferences and seminars. Ms. Ewans went on to introduce the exhibition 'Himalayan Vision' by Heather Angel. The exhibition addressed a broad range of issues confronting the Himalayas. Ms. Angel, a former President of the Royal Photographic Society and the author of many books on photographic techniques, was specifically commissioned by the British Council for this assignment. She has also led many photographic teams to different parts of the world. Ms. Angel has received an honorary doctorate in Science from the University of Bath for 'distinguished work in wildlife photography' and was a visiting professor in the Department of Life Sciences at Nottingham University. In conclusion, Ms. Ewans recounted the rich biodiversity of the Himalayas and noted that references to this could be found in scriptures such as the Vedas and Upanishads. Repeat photography was also a useful recording tool. Photographs taken a 100 years ago could be compared with more recent photographs of the same sites to illustrate the extent of change, if any. Ms. Ewans also acknowledged the work of other agencies and that of HMG-Nepal in conservation.

After concluding the inaugural session, participants were invited to view the exhibition, 'Himalayan Vision'. Heather Angel's exhibition was complemented by photographs by American photographer and rangeland specialist, Daniel J. Miller. Mr. Miller worked at ICIMOD and was also a well-known photographer of rangeland topics.

A break for refreshments was also taken, after which the participants were transported to the ICIMOD conference hall for the remainder of the first day's sessions.

Day One

Technical Session One

Chairperson
Professor Pei Shengji

OVERVIEW OF THE KANCHANJUNGA AREA, NEPAL

TIRTHA M. MASKEY

Introduction

The Kanchanjunga area is situated in the Taplejung District of northeastern Nepal. The district is linked to the *Terai* by a new access road. Taplejung is also accessible by plane from Biratnagar and Kathmandu. The climate is variable depending on its location along the elevation gradient. The district has a broad elevation range of from sub-tropical to nival bioclimatic zones.

The climate, compared to the rest of Nepal, has a prolonged wet season caused by the early arrival and late departure of the monsoon (Stainton 1972). Most of the district is exposed to the full force of the monsoon and has humid summer conditions. A small area at the headwaters of the Tamur *Khola* is the exception, having dry inner valley conditions (Stainton 1972).

The topography is characterised by narrow V-shaped valleys with steep side slopes. The area is drained by the Kabeli, Simbuwa, Gunsa, and Yangma rivers which are tributaries of the

Tamur River. These Rivers cut deeply into the mountains, creating deep gorges. Demographically, the district is relatively sparsely populated, the estimated population being 122,072. The dominant ethnic groups are the *Limbu*, *Bhotia*, and *Sherpa*. The population is concentrated in the lower parts of the district.

A recent study of Kanchanjunga area states clearly that the area is unique

Plate 1: A typical Limbu house: Mamankhe (1,800m)



Photo: Devendra Amatya

in terms of rich biodiversity, cultural heritage, and geomorphology.

The National Conservation Strategy of Nepal, which is endorsed by His Majesty's Government, recommends giving highest priority to the establishment of one or more protected areas on Nepal's borders. The protected areas will help preserve rare or endangered species and protect genetic diversity and essential wildlife habitats.

According to the National Conservation Strategy for Nepal, the Kanchanjunga area meets four out of six criteria to qualify as a protected area. The four criteria are:

- a) contains sites of significant religious, cultural, archeological, or historic value;
- b) contains examples of outstanding site-specific or unique land forms or geomorphic features;
- c) contains sites necessary for the preservation of genetic diversity; and
- d) contains habitat essential for the protection and promotion of rare and/or endangered species.

The Department of National Parks and Wildlife Conservation (DNPWC) has already forwarded the proposal to declare the Kanchanjunga area a conservation area to the Ministry of Forests and Soil Conservation. It is expected that the Kanchanjunga area will be declared and gazetted as a conservation area within a month or so.

Challenges and Threats

However, there are a number of challenges and threats facing the conservation of Kanchanjunga area. Some of them are discussed briefly here.

Forest Degradation

Local People are dependent upon the forests to meet fuelwood, fodder, construction, and heating needs through-

out the conservation area. Expanding population and increasing tourism may result in degradation of forest resources, especially in critical high altitude areas.

Slash and Burn Agriculture

Shifting cultivation is common in the area and the time span between cropping has declined significantly, resulting in decreased agricultural productivity and increasing incursion into forests and wildlife habitats.

Lack of Trained and Equipped Natural Resource Managers

The impact of the District Forest Office in the Kanchanjunga region has been limited due to inaccessibility and staff shortages; there are no DNPWC staff in the area currently.

Lack of Integration between Local Resource Users and Central Authorities

There is insufficient information about the relationship between local people and natural resources in the Kanchanjunga area. Furthermore, local institutions managing natural resources have not been integrated into local development initiatives.

Inadequate Physical Infrastructure

There have been few government projects in the region, therefore the area lacks even the most basic physical infrastructure. This absence of physical infrastructure has hampered the development and marginalised the region's economy.

Lack of Social Infrastructure

Basic facilities providing social infrastructure such as schools, health care posts, and veterinary clinics, are absent and/or inadequate in the conservation area. Furthermore, women, low castes, and non-Hindu ethnic groups have been marginalised.

Lack of Information on Kanchanjunga's Flora and Fauna

There is a lack of accurate information on flora and fauna, especially on threatened species. Local informants indicate healthy populations of snow leopards (*Panthera uncia*), blue sheep (*Pseudois nayaur*), and serow (*Capricornis sumatraensis*). Very little, though, is known about the habitat status and population trends of these and other threatened species such as the Himalayan musk deer (*Moschus chrysogaster*). There is no information available on the numerous small mammals that are found in the conservation area. Several large birds of prey and pheasants inhabit the area and their status needs to be investigated.

Overgrazing of Rangelands

The dangers of overgrazing and associated soil erosion have been recognised for many years in Nepal. High elevation grasslands and forest areas in Nepal are deteriorating as livestock numbers increase. Overgrazing by domestic livestock and increased competition for forage may directly threaten Kanchanjunga's blue sheep (*Pseudois nayaur*), goral (*Nemorhaedus goral*), and serow (*Capricornis sumatraensis*) populations. However, local people, by tradition, have the right to graze their animals on the pastures and in forests of the Kanchanjunga area.

Incursions into Habitat and Poaching of Threatened Wildlife

Kanchanjunga's unique Himalayan larch and extensive juniper coverage face immediate threats from incursions. Hunting by local people and government employees is reported to be a big problem in the region; the extent of poaching, though, is poorly understood.

Inadequacy of Tourism Infrastructure

The Kanchanjunga area is unprepared for the impacts of tourism. Increased tourism, if unplanned, could have a harmful effect on the indigenous cultures, local institutions, and ecosystems. However, in an area like Kanchanjunga, it appears that without economic and infrastructural inputs, as well as tourism income, the local cultures and institutions are just as likely to suffer.

Based on extensive discussions between the local people and the Department of National Parks and Wildlife Conservation/World Wildlife Fund (DNPWC/WWF) teams, it is clear that the residents of the area would welcome the economic benefits tourism has brought to other areas of Nepal — e.g., the Khumbu region. There is a general belief that tourism will bring prosperity to the region. However, the local people are neither aware of the nature of tourism enterprise, nor do they have the funds to develop tourism facilities.

Emigration and Cultural Decline

Emigration from the Kanchanjunga area is a growing phenomenon. Generally, the wealthy and the economically marginalised emigrate to the district centre, the *Terai*, or to Kathmandu. The case of the



Photo: Devendra Amatya

Plate 2: Pasture land at Tseram with yak herd (2,500m)

Digichiling Gompa (monastery) of Olangchung Gola succinctly illustrates the effects of emigration and the economic decline of local cultural institutions. The massive and elaborate (*gompa*) monastery was built when Olangchung was one of the wealthiest trading entrepôts in the Himalayas. Now, many of Olang-chung's wealthy and influential residents have left; since the local community is now smaller and less prosperous, the monastery is experiencing a severe crisis in terms of both finances and personnel. Unfortunately, other communities of the Kanchanjunga area are in the same situation. Without investment in infrastructure and income-generating activities, many cultural institutions could disappear because of lack of local support.

Transboundary Conservation

The Kanchanjunga mountain system forms the border of three nations: Nepal, India, and China. So far, there have been no coordinated efforts to conserve this unique ecosystem and control threats such as those of poaching, habitat incursions, and over-harvesting of plants.

Priority Areas for Conservation

It is imperative to identify priority areas in the Kanchanjunga region before

managing it as a conservation area. The following areas have been considered important because of their size, relatively undisturbed nature, and their vulnerability to human-related disturbances (Yonjon 1996).

Amjilhasa - Khambachen

This area of rich biodiversity is comprised of settlements such as Pholey, Gyaphla, Ghunsa, and Khambachen. The maintenance and management of natural resources, especially high-altitude forests and pasture lands, are important. Above Amjilhasa, denuded oak forests signify overgrazing. The monitoring of yak and domestic sheep populations will be central concerns when dealing with subsistence issues in the area.

Ghunsa - Mirgin La

Combinations of Juniper (*Juniper indica*), rhododendron (*Rhododendron sp*), and birch (*Betula sp*) forests are impressive in this area. There is a wide diversity of bird life. The forests close to Ghunsa are already showing signs of human-related disturbance. A few alpine pastures are highly degraded because of grazing and further abused by organised trekkers using them as camping grounds. This area is also the prime habitat for snow leopards.

Ramje - Tseram

Ramje and Yalung are prime habitats for both snow leopards and blue sheep. Lower Tseram provides a habitat for red pandas (*Ailurus fulgens*) and other ungulates such as musk deer (*Moschus chrysogaster*), goral (*Nemorhaedus goral*), and serow (*Capricornis sumatraensis*). Because this area is a main thoroughfare for cattle movement, rapid habitat degradation is possible.



Plate 3: Khambachen Village (4,000m)

Photo: Devendra Amatya

Deorali Danda - Amje Khola

Deorali Danda¹ is contiguous with Tseram, although dissected by the Simbuwa Khola. Excellent stands of *Tsuga dumosa* and *Abies spectabilis* also exist here. Some slash and burn activities have begun in the temperate evergreen forests at lower elevations.

Carpenter et al. (1994) reported Dhupi Danda (2,480m) between Omje Khola and Yamphudin to contain the most diverse forest stands in the Kanchanjunga region. Further work would reveal if such floral diversity also incorporates similar diversity in fauna.

Olangchung Gola - Yangma

This valley consists of conifer forests and shrubs with a large expanse of grazing area. This area is famous for blue sheep and snow leopards. The area is also part of a trade route to Tibet.

References

- Carpenter, C.; Baner, K.; and Nepal, R., 1994. *Report on Flora and Fauna of the Kanchanjunga Region*. Wildland Study Programme, San Francisco State University. Report Series # 14. Kathmandu: WWF Nepal Programme.
- Stainton, J.D.A., 1972. *Forests of Nepal*. London: John Murray.
- Yonzon, P.B., 1996. *Status of Wildlife in the Kanchanjunga Region: A Reconnaissance Study Report*. Report series # 23. Kathmandu: WWF Nepal Programme.

Discussion

Mr. Javed Hussain from WWF, Thailand, wanted to know what would be the legal definition of the proposed gazetted area. The other observation he raised was that the different zones did not seem to fit very well with the traditional IUCN (The World Conservation Union) categorisation, because they overlapped and there seemed to be a need for a functional definition rather than a special definition. How could that be accommodated with the overlapping of functions? The third question was that the presentation seemed to suggest that there were a lot of problems in the different systems. What would be the advantage in terms of conserving the area by taking it from a national status to a transboundary status?

Dr. T.M. Maskey replied that there was already a provision for declaring this conservation area in the gazettelement, and His Majesty's Government could declare any area by designating the boundary of the area a conservation area. The main objective of the conservation area, as already mentioned, was to protect the area with people's participation.

Regarding the second question, there were problems because at the moment there was no legal way to control all the destruction that was taking place in that region. Once the area was declared a conservation area there would be a legal framework to protect the conservation area which could minimise all the damages. Preparation was already in process for the management and the operational plan for the area. Work would begin accordingly.

Regarding the third question, as Mingma Sherpa had already men-

¹ danda = hill, cliff

tioned, there already was transboundary conservation in Qomolangma National Park in Tibet. In Nepal, Sagarmatha, Langtang, and Makalu Barun were transboundary areas. With these experiences one had benefited in terms of awareness of conservation problems in border areas. If there was no trans-boundary conservation concept, there would be no communication at all and it would be difficult to identify the problems. There had been one trans-boundary conservation meeting with the Indian authorities two months previously and problems of the border areas had been discussed

to reach a solution to help protect the flora and fauna in that area. Similarly, a visit had been made to the Tibetan Autonomous Region of China for discussions. Nepalese people along the border areas went to Tibet to poach and steal timber. Similarly, Tibetan people came to Nepal to steal animals. Therefore, ways of controlling these activities were discussed and a local-level coordination committee was formed with the representation officers from both areas. Therefore, the concept of transboundary conservation was very helpful in protecting an area.



View 2: Sherbhoche Village (4,000m)

OVERVIEW OF KANCHANJUNGA² AREA, SIKKIM

GUT LEPCHA

Ecological and Wildlife Background of the Sikkim Mountains

Sikkim is a small Indian state in the Himalayas, lying between latitudes 27° 03' 47" and 28° 07' 34" North and longitudes 88° 03' 40" and 88° 57' 19" East and covering an area of 7,069sq.km. It is encircled by Nepal in the west, Bhutan and the Chumbi Valley of Tibet (China) in the east, Darjeeling-Gorkha Hill Council of West Bengal in the south, and the Tibetan Plateau of China in the north.

In the field of wildlife conservation, Sikkim has progressed a great deal with the establishment of one big national park, Kanchanjunga National Park, and five wildlife sanctuaries. The National Park is bordered by Tibet (China) and Nepal, and there is one sanctuary with the latter in the western extremities. The network of Protected Areas (PAs) covers as much as 28.87 in terms of geographical area and 43 per cent in terms of the total

forest area of the State. As per the biogeographic report, it is the best covered of the Wildlife Protected Areas (WPAs) in the country.

The Kanchanjunga (High Altitude) National Park, Sikkim

History

The Kanchanjunga National Park, which is at the apex of the high altitude national parks, is the highest in the country. Having considered the floral, faunal, ecological, and geomorphical importance and the wildlife potentials of the area, this National Park was commissioned on 27 August, 1977. Situated between elevations 1,829 to over 8,585masl, this Park is endowed with one of the most extensive high-altitude ecosystems in the world. It is probably the largest, biologically intact continuous tract of mountainous land with valleys of lush green forests, meadows, and alpine

² Known as Khangchendzonga in Sikkim



Plate 4: Bhotia children collecting Juniper leaves

Photo: Ajay Rastogi

lands reserved primarily for the conservation of native wildlife. It is home to luxuriant flora and a galaxy of magnificent fauna of rare varieties, some of which are endemic to the area.

Situation

The Kanchanjunga National Park lies within latitudes 27° 25' and 27° 55' North and longitudes 87° 59' and 88° 40' East. It is a vast area, extending from the cold desert of Lhonak Valley, to the ridges of Lachen in the North District, to the historical location of Yuksom, and extending as far as Boktok, Daphey Bhir, and the Nepalese border in Western Sikkim. The western boundary of the Park runs along the international boundary between the Indian State of Sikkim and Tibet (China) in the North and Nepal in the West of the State.

Area

Originally it covered an area of 850sq.km., and, in 1996, it was extended to 1,784sq.km. because of its ecological, faunal, floral, and zoological significance. The basic objective of bringing more areas into the National Parks is also to create diverse habitats for wild animals. With the expansion in its area, this Park alone now occu-

pies as much as 25.14 per cent of the land area of the State compared to 11.97 per cent in the past.

Status of Land

The vast expanse of the Kanchanjunga is within the government reserved forests. Except for a small village of the Tibetan community settled since 1959 in a place called Tsoka, which is now comprised of 10 houses with a total population of 90, there is no other village settlement inside the National Park. Since this small village, occupying almost 13 acres of land, is situated in an isolated pocket within the area being proposed as a tourism zone, it will have to be considered as part of the ecosystem of the Park. The only negative factor is the grazing that is taking place in a few cattle camps on the western and southern extremities of the Park. The owners have been enjoying grazing rights for many years, despite the efforts made to evict them to areas available outside the Park. There is also a statutory order of the State Government banning cattle grazing inside the Reserved Forests.

Consequent to the expansion of the area, the National Park is being demarcated into three zones - the Core, Buffer, and Tourism Zones.

Flora, Fauna, and Avifauna

Flora

The floristic wealth of the Park is rich and diverse in both composition and value. The forests are representative of a variety of plant communities which include diverse vegetational types corresponding to variations in climatic and edaphic factors. The area broadly comes under Champion and Seth's classification types sub-group 11b- northern montane temperate and group 12- himalayan moist temperate forests; sub-alpine scrub forests; and alpine scrub and pastures.

Thus, the flora of the Park can be sub-divided broadly into three forest zones.

1. Temperate Broad-leaved Forests (1,829 - 2,730m)
2. Mixed Coniferous Forests (2,730 - 3,650m)
3. Alpine Scrub and Grasses (above 3,650m)

Fauna

Kanchanjunga National Park is a gene reservoir with diverse habitats. The faunal wealth is also equally rich in content. The high altitude alpine and plateau region is as rich in faunal wealth as the foothills. The Snow Leopard (*Panthera uncia*) of the alpine area is at the apex of the biological pyramid. The state animal or Red Panda (*Ailurus fulgens*), Musk Deer (*Moschus chrysogaster*), Great Tibetan Sheep (*Ovis ammon hodgsoni*), Bharal or Blue Sheep (*Pseudois nayaur*), Goral (*Nemorhaedus goral*), Serow (*Capricornis sumatraensis*), Barking Deer (*Muntiacus muntjac*), Leopard (*Panthera pardus*), Common Lesser Cat (*Felis sp*), Wild Dog (*Cuon alpinus*), Tibetan Wolf (*Canis lupus*), Mountain Fox (*Vulpes vulpes*), Tibetan Fox (*Vulpes ferrilata*), Himalayan Black Bear (*Selenorctos thibetanus*), Marmot (*Marmota fumi*), and Monkey (*Macaca sp*) are the principal animals.

Avifauna

As the State is rich in bird-life, with around 550 species and sub-species, the Kanchanjunga also harbours many forms of highest interest and rarity. The flamboyant altitude pheasants include the Monal Pheasant (*Lophophorus impejanus*), Crimson Tragopan (*Tragopan satyra*), Blood Pheasant (*Ithaginis cruentus*) (State Bird), Tibetan Snow Cock (*Tetraogallus tibetanus*), Himalayan Snow Cock (*Tetraogallus himalayensis*), and Partridge (*Francolinus sp*). The birds of prey include the Lammergeier

(*Gypaetus barbatus*), 23 species of owls—including the Forest Owl (*Bubo nipalensis*), Eagles (*Aquila spp*), Falcons (*Falco spp*), and Hawks (*Spizaetus spp*). There are snow and rock pigeons (*Columba leuconota*, *C. livia*) and many more birds in the National Park. The high altitude lakes form stopover sites for migratory waterfowl such as the Bar-headed goose (*Anser indicus*), Eastern Goosander (*Mergus merganser*), Brown-headed Gull (*Larus brunni-cephalus*), Pintail (*Anas acuta*), Grebes (*Podiceps spp*), and the most endangered crane in the world, the Black-necked Crane (*Grus nigricollis*). These lakes are also breeding sites for resident waterfowl such as the Brahminy Duck (*Tadorna tadorna*), Avocet (*Recurvirostra avosetta*), Coot (*Fulica atra*), Shovelers (*Anas clypeata*), and Pochards (*Aythya spp*).

Management Programmes

Enforcement and Anti-Poaching Operations

Enforcement is the primary aspect of management in the Kanchanjunga National Park. It is carried out by 33 Park staff. Anti-poaching operations, such as trap demolition and patrolling in the poaching prone areas, are conducted both in and out of season. In such operations, field staff are armed with guns and ammunition to contend with musk deer poachers. High altitude expeditions of senior officers of the Park and Wildlife organisation are also organised from time to time, with a view to studying the current status of the highlands consequent to increased human impact by tourists; trekkers; mountaineers; grazers; medicinal plant collectors; and, to some extent, poachers. The Park has a network of wire-less communications set up in important places, and this is fully and effectively used during such outdoor activities. Musk deer poachers were active in the early eighties, but the incidence

of poaching has been greatly reduced due to the development activities taking place in the buffer villages. The poachers now have a tendency to carry out contract work which fetches a lot of money in the short term. However, an exception is made here in the case of grazers who are suspected of indulging in poaching animals in high altitude areas where they go with their cattle.

Public Participation

Local residents are actively involved in Park Programmes. Development work in the buffer villages, as well as in the Park, is implemented with the active involvement of the local people. They are also educated through media such as the radio and audio-visual programmes, which include slide film shows, wildlife literature, posters, and so on. Local schools are also involved in important Park functions. The school children are taken on nature visits to wildlife interest areas.

Staff Amenities

The successful management of the Park depends on the dedicated staff posted there, and they need to be given reasonable amenities. Park staff amenities include free accommodation, hardship allowances for those who have been posted in difficult areas, and high altitude allowances for protection duties in high altitude areas. The subordinate staff up to the level of Range Officers are provided with uniforms.

Infrastructure

Field infrastructure, such as inspection or patrolling paths to improve the primary means of communication, log huts, log bridges, wildlife hides, bunkers, and watch towers, has been built inside the Park to help provide sound and effective management.

Eco-Development Programmes

Eco-development programmes are designed to improve the socioeconomic

conditions of the people residing in the buffer villages and to elicit their active support and cooperation in the protection of the Park. The programmes include afforestation of degraded areas with fuel and fodder-yielding plants in the buffer areas, broom grass cultivation on private holdings, free distribution of horticultural plants, and fuel-saving devices for local residents and villagers.

Park Boundary Demarcation

The boundary of the National Park is about 350km in length, of which about 100km have been demarcated with boundary pillars at intervals. Demarcation has been carried out in places where there were possibilities of encroachment. Otherwise, in most places, features such as rivers and ridges in marginal forest areas are left out for public utility.

Research and Monitoring

Research and monitoring facilities provide a scientific understanding of wildlife populations and habitats, and this is essential to their proper management. Data are required on broad ecosystem components, such as hydrology, soils, vegetation, and animal numbers- repeated at regular intervals. A Wildlife Research Wing is already engaged in the study of animals and birds, their ecology, and habitats in an attempt to review and revise the existing records. A status survey of principal animals and birds has already been undertaken. Wildlife areas have been surveyed and mapped. The Park has also been equipped with monitoring equipment, e.g., darting and camera equipment.

Regulation of Tourism

Tourism in the Indian State of Sikkim is in an early stage of development. But there is tremendous scope and prospects for it. The Sikkim mountaineering experience is unique for climbers;

and so is the trekking for different age groups in good physical shape and with trekking experience in high altitude areas. Kanchanjunga National Park includes some of the best-known mountains and peaks which are a great attraction for mountaineers and trekkers from all over the world. Adventure tourism is slowly picking up in this part of the region.

Yuksom, a sleepy village that awakens only when a tourist/trekker knocks at its door is a place of attraction outside the Park in western Sikkim. Some 16,000 tourists visit this place each year and about 10,000 of them are foreign nationals. Yuksom, which has been developed to the extent services can be for the present, has a huge Wildlife Interpretation Centre for a nature interpretation programme, and is also a checkpoint for mountaineers and trekkers to the Park. The Park charges an entry fee and a fee for photography. Mountaineers also require visas. Northern Sikkim is the gateway to the northern side of the Park. Here, the main route to most of the popular mountain peaks passes through and is restricted to some visitors. A special permit is required from the Central and State Governments for adventure tourism purposes. Tourism provides a significant income to poor residents in the buffer villages.

Transboundary Grazing

Singalila Range forms the international boundary between the Indian state of Sikkim and the Kingdom of Nepal. The well-established path along the boundary from Chewabhanzyang to Paharay Megu is the traditional transit route for Nepalese and Sikkimese grazers. The path routinely follows the international boundary, except in some places where it loses height on either side and again abruptly resumes the boundary line. Grazing is intense in the transborder areas. Nearly 2,000 yaks

Photo: Ajay Restogi

and cows and an equal number of sheep belonging to Sikkimese grazers are found from the temperate forests to the alpine lands. The population of cattle on the Nepal side near the border is also quite substantial. One is often astounded by their sheer numbers and the intensity of grazing taking place on the fragile ecosystem. The area is, in places, overgrazed and overexploited, leading to degradation. Patches of land subjected to intense ramming and compacting are often the sights in this zone. Green branches of rhododendrons and junipers are burned raw and cut for heating and cooking purposes, while the leafy branches are used for mats for milch cattle (cows and yaks). Small timber is also required for construction of shepherds' huts, cattle sheds, or for repairing old ones. The grazers also collect medicinal plants and rhododendron and juniper leaves for incense. Thus, substantial damage, in terms of loss of biodiversity or damage to the main vegetation, has already been caused. The hills and slopes, ridges, and gorges are bereft of vegetative cover and they look sick and diseased. It is not only the cattle that have exhausted the vegetation but the greed and avarice of human beings which are equally responsible for loss of natural resources. So, there is need for a collaborative effort between governments to control

Plate 5: *Larix griffithiana* (fruiting)



grazing or to restrict entry to an optimum figure of cattle consistent with the carrying capacity of the transboundary areas which are already depleted. However, there is tangible progress in this direction, with the State Government of Sikkim carrying out closure of grazing in all reserved forest areas in the State.

The Trans-Himalayan Zone

Northern Sikkim is like a typical Tibetan plateau. Chho Lhamo and Lhonak Valley encompass an area of 200sq.km. and are situated on the Indo-Chinese border in Northern Sikkim, and the rest of trans-Himalayan Sikkim consists of the State's richest areas in terms of biodiversity. Most of the endangered fauna in these areas are transborder migrants.

The Tibetan Wild Ass or Southern Kiang (*Equus hemionus kiang*), Nayan or the Great Tibetan Sheep (*Ovis ammon hodgsoni*), the Blue sheep or Bharal (*Pseudois nayaur*), Tibetan Antelope (*Pantholopus hodgsoni*), and Chiru or Tibetan Wolf (*Canis lupus chanco*) are the principal fauna found in this zone. Human attendance, better grass growth in summer, and water and snow which reduce forage

availability in winter are the factors that cause seasonal movements of animals. Field reports reveal that the population of Southern Kiang is no more than 4-40 individuals which migrate through passes such as the Sese La, Bamcho La, and Tsak La which form the international border between Sikkim and China. Trans-Himalayan Sikkim is a restricted area where no visitors and civilians, other than local inhabitants and personnel of different organisations working in the area, are permitted. Nomadic grazers, whose family units number about a dozen and who own about 990 yaks and 650 sheep, medicinal plant collectors, and defence personnel are the competing agencies with which animals in these eco-sensitive areas have to cope, and, as a result, they have to live under various forms of threat and stress on Sikkimese territory. Illegal cross-border trade in wildlife has not been reported yet. The population of transborder migrants and the status of adjoining areas in Tibet are not known. The high altitude lakes around the border, such as Chho Lhamo, Gurudongmar Tso, Gyam Tso in the Chho Lhamo plateau, and Tso Chik, Tso Sum, Tebleh Tso, Than Tso, and Ghora Tso in the Lhonak Valley, are stopover sites for many of the migratory waterfowl, in-

Plate 6: Trans-Himalayan plateau area in North Sikkim

Photo: Ajay Rastogi



cluding the world's most endangered crane, the Black-necked Crane (*Grus nigricollis*), a pair of which was reported to have unsuccessfully nested for three to four months in Tebleh Tso near Muguthang in Lhonak Valley in 1991. Three cranes were reported to have visited the same lake again in June 1996, and, after halting there for about eight to ten days, they were again on their way. Nature recognises no political boundaries. Flora and fauna live within ecological boundaries which may overlap or cross park and international borders, regardless of lines on maps or border checkpoints. In order to protect, preserve, and develop the transborder, threatened faunal migrants, and endemic flora, including valuable medicinal herbs and plants, the State Government of Sikkim is going to declare this Sikkim transborder, a biodiversity area of approximately 200sq.km., as a Cold Desert Park and prescribe special protection measures to check the elimination of flora and fauna. It will call for the establishment and collaborative management of transboundary protected areas by both the Indian and Chinese Governments for the sake of wildlife and their habitats.

Indo-Nepal-Tibet (China) Watershed

The Indo-Nepal-Tibet watershed runs south to north along the Singalila Range. It forms the international boundary between the Indian State and what else? There are several mountains and peaks located on this boundary and most of them are sacred. Mount Kanchanjunga occupies the predominant position on the boundary flanked by The Twins, Nepal Peak and Tent Peak, Pyramid Peak, and Langpo Peak on the southern side. These mountains and peaks influence the climate in the region, and the watershed areas along the boundary play a pro-

tective role in soil and water conservation. This greatly benefits the lowlands on both sides of the transboundary.

Sikkim Transboundary Trekking Route

The State Tourism and the forest departments have jointly carried out a field survey with a view to opening a new alternative route along the Singalila Range on the boundary. The entire traverse is particularly suited to long adventurous treks, which if leisurely undertaken will last for about seven to eight days. Nature trails, which of late have been popular, could be organised for both foreign and domestic trekkers in this part of the region with the permission of the governments. The already established route follows the boundary, except in some places where it falls below it on both sides. If impediments, such as the concurrence of governments on both sides for use of substantial distances on each side, are sorted out, eco-tourism in the region could develop. This alternative trekking route will not only join the alpine land dotted with lakes for pristine and unspoilt nature trails, but it will also minimise trekking impacts on other existing routes.

Kanchanjunga Biosphere Reserve

To conserve, for present and future use, the diversity and integrity of biotic communities of plants and animals within a natural ecosystem, a Kanchanjunga Biosphere Reserve, covering an area of 2,566sq.km., is being established. The objective is to safeguard the genetic diversity of species. This reserve will also be managed for research, education, and training. The Kanchanjunga Biosphere will include Kanchanjunga National Park, an area 1,784sq.km., as Core Zone I and Maenam Wildlife Sanctuary, located in southern Sikkim and covering an area

of 104sq.km., as Core Zone II. It will also have five buffer zones. Its boundary on the western extremity will run along the Singalila Range which forms the international boundary.

Discussion

The representative of WWF Nepal Programme, Mr. Mingma N. Sherpa, praised the presentation of *Mr. Gut Lepcha*. He pointed out that there seemed to be incredible opportunities for cooperation between Nepal and India in terms of promoting tourism. He asked if there had been anything done so far in that area. He also talked about the biosphere proposal of Sikkim. He pointed out that Kanchanjunga on the Nepal side was going to be declared a conservation area, which meant a low status protected area or a multiple-use concept. He suggested that it would probably be better if Nepal would also adopt the biosphere approach. It did not have the status of a National Park or a wildlife sanctuary, so it was a multiple use area; the idea being to benefit the local people of that area. Were there any benefits to or opportunities for Nepal in thinking on the lines of declaring a biosphere reserve? Probably the whole Kanchanjunga area from the mountains to the plains could be set aside as a biosphere reserve. He further added that his understanding of biosphere reserve included everything; people, landscape, and so on.

The representative from Sikkim, Mr. Gut Lepcha, pointed out that the State Tourism Department and the Forest

Department had jointly surveyed the Singalila Range to find an alternative to the trekking route. This route falls low down on the Nepal side in some areas and in some areas on the Sikkim side. It is up to the two governments to decide whether to share the route or to have a separate route along the boundary. Adventure tourism is slowly picking up in Sikkim, so the State Government is interested in opening an alternative to the trekking route which will benefit both countries, especially in terms of the upliftment of the poor living in that area. Regarding the Kanchanjunga Biosphere Reserve, it had been identified because of its richness and the State Government would soon be declaring it a biosphere reserve. The State Government would also prepare a comprehensive project. If it was established, the biodiversity area would increase on both the Nepal side and the Sikkim side. The habitat area would also increase on both sides.

Mr. E. Sharma, from Sikkim, added that the Government of Sikkim, Tourism Department, was developing a master plan for tourism focussing on eco-tourism and adventure tourism. Many exercises were already being carried out between the Forest Department and other departments in trying to come up with a master plan which would be environmentally friendly. In fact, all the tourism in Sikkim was concentrated in protected areas. Therefore, the basic philosophy of conservation would come up in the master plan.

SIKKIM

Wildlife Protected Areas in Sikkim



Source: Map of Sikkim Scale 1:150,000 Survey of India (1981).
Data Source: Protected Areas in Sikkim, Department of Forest, State Govt. of Sikkim.



OVERVIEW OF THE KANCHANJUNGA REGION IN THE TIBETAN AUTONOMOUS REGION OF CHINA

BAN ZONG

Introduction

I would like to introduce the National Reserve System of the Tibetan Autonomous Region of China. One of the largest nationally protected areas in China is the Qomolangma Nature Preserve (QNP). It is located on the southwestern border of the Tibetan Autonomous Region (TAR) and has four districts; Tingri, Nyalam, Kyirong, and Dingye. The total area of the land is 33,819sq.km. and the population is 8,000. A ten-year integrated master plan for conservation was first established in 1989 to establish a provincial Nature Reserve. Later, in December 1994, the area was approved as a National Nature Reserve.

Management

The QNP is administered through the Working Commission for the Qomolangma Nature Preserve which has its headquarters in Lhasa. This Working Commission represents 16 member organisations from various TAR departments. There are repre-

sentatives from Forestry, Economic Planning, Health and Education, Tourism, Science and Technology, and the Bureau of the Environment, and a representative from the Shigatse Prefecture. The Working Commission acts as an inter-agency coordinating body, facilitating communication, cooperation, and technical assistance among, and from, its representative groups. Besides coordinating the efforts of the members, the Working Commission also has the responsibility of uniting and assisting local and county governments and departments in the management of QNP. It also has the responsibility of seeking assistance, coordinating resources available within China, and acting in liaison with international organisations to further develop QNP. Four branch bureaus have already been established in all the above four districts falling in the QNP region. The Working Commission office is located within the Forestry Department and has been recently expanded to include additional administrative and management responsibilities.

Plate 7: *Primula deuterinana*
(Primrose)

Photo: Krishna K. Shrestha



ties over three departments; Qomolangma Nature Preserve, Tibetan Autonomous Region Forest, Nature Preserve and Wildlife Management, including the Chang Tang Nature Reserve with a total of 13 preserves, and the Lhasa Office of the People's Republic of China representative office of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) for the protection of endangered species.

Objective

The main objective of the reserve is the conservation of nature while developing the economy, since both conservation and development complement each other. It also aims to contribute to the global conservation of nature and the promotion of exchanges with bordering countries like Nepal, India, Bhutan, and Pakistan.

International Collaboration

International collaboration has already been established with the United Nations Development Programme (UNDP) for training and capacity building; the Mountain Institute, USA; the Concerning World Development Organisation, USA; and the Foundation for Future Generations, USA, for the conservation and development of the area.

Demarcation

Ten years of development planning for the Qomolangma Natural Preserve has

already been launched for the period from 1990 to 2000 A.D. The area has been divided into three zones. The Core Zone is comprised of 10,324.85sq.km. (32.45%) and is a protected area for the conservation of rare and precious plants and animals. The Buffer Zone covers 6,254.93sq.km. (18.45%) of the total land area. Development and experimental activities with less impact on the environment are allowed in this area. The Economic Development Zone covers a total land area of 16,561.30sq.km. (48.84%). This area focusses on sustainable development of agriculture and animal husbandry for local communities and eco-tourism and handicrafts' production.

Education

Education is a big problem in the area, and only about 40 per cent of the children attend school. In some parts, attendance is lower than 15 per cent due to poverty, remoteness, and lack of school facilities.

Primary Health Care

There are insufficient numbers of trained doctors and nurses and even the fundamental facilities for primary care are not available. Family planning education is very poor. Modern water supply facilities are not available in any of the villages. There is a lack of well-trained staff, so management of the area has not been efficient so far.

Training of Staff

The training of staff is a critical issue and only a few staff have training in conservation. A training centre for staff was proposed, and it has already been established, but, due to a lack of funds, there have been no activities, nor has building construction commenced. A communication and information centre is urgently needed at QNP Headquarters in Lhasa.

Nursery

Three forest nurseries have been established in the natural preserve to provide free seedlings for afforestation to the local communities in the area. The objective of this is to improve environmental conditions, living standards, health, family planning, development of agriculture, livestock, housing, and so on. The general objective of the reserve is to provide more farming opportunities and to improve the incomes of the local people.

Immediate Objectives

- Improving mountain people's living standards and quality of life
- Preserving and protecting the mountain environment's condition
- Improving mountain people's health and education, training of local people in income-generating activities, self sufficiency, and micro-enterprise development
- Improving agriculture, animal husbandry, housing, communication, and basic infrastructure

Dinggye District

Dinggye is one of the four districts falling into the QNP area. The administrative management of the district was established in 1960. There are 11 sub-districts and one township; the latter is located 510km south of Lhasa and 230km south of Zhikatzé City. Kanchanjunga mountain is located towards the southwest of the district bordering Nepal and Sikkim. The total land area covered by the district is 7,560sq.km., and it is situated on the northern slope of the Himalayan mountain range. The climate in the area is dry (trans-Himalayan), cold-dry, or cold desert with strong winds for up to eight months and only 100 frost-

free days. The annual rainfall is 350mm, and it falls mainly in the months from July to September. The total population of the area is 20,000 and the average elevation is above 5,000m. Six sub-districts of the area are defined as QNP protected areas. The major ethnic groups are Tibetan, *Sherpa(s)*, and *Han* Chinese.

Timber is produced in an area of 2,667ha and agricultural land covers 600ha. Rangeland covers 313,600ha and 32,100ha consist of forested land. There are 800,000ha of unused land and 20,000 livestock. Forest covers 5.93 per cent of the total area and the common species are *Picea spectabilis* and *Abies sp.*, *Larix sp.*, etc. The total river length is 500km and the radiation is 3,300. The national grade I wildlife found in the area are Tibetan antelope (*Pantholopus hodgsoni*), Takin (*Budorcas taxicolor*), Himalayan Tahr (*Hemitragus jemlahicus*), Snow Leopard (*Panthera uncia*), and Tibetan sheep (*Ovis ammon hodgsoni*). The agricultural crops commonly grown in the area are barley, mustard seed, potatoes, and peas.

The level of education is very low in the area, and there are only 12 primary schools (7 public and 5 private). There are three motorable roads connected to the district. Only one sub-district, Cheng-Tang, is not connected by road.

The Future Plans of QNP³

How to Implement Development, i.e., Training, Education, and Promoting Comprehensive Development.

To promote village economies as a component of our master plan for QNP, we must seek to:

- develop a mechanism for extension of micro-credit type loans to individuals and groups;

3 According to a paper received by ICIMOD from the QNP Office, Lhasa, Tibet

- b) build and equip village schools;
- c) train village teachers;
- d) train tourist service workers;
- e) train and equip village / public health service providers; and
- f) provide agricultural assistance in by training and by providing suitable and sustainable crops such as apple trees.

Future Development of Areas of Interest

- a) Develop a system for management information and communications between Lhasa QNP Headquarters and local branch offices.
- b) Research will be introduced in the areas mentioned here.
 - i. Determine optimal tree species for local consumption (cooking and building) in both mountain forest and agricultural areas, including arid regions
 - ii. Develop a programme to introduce (or re-introduce) bamboo species for use in handicrafts and building materials (determine best-suited species for high yield and quality)
 - iii. Animal husbandry issues relating to strengthening of herds and improvement of breeds
 - iv. Solar energy research into appropriate, low-cost, and available technology and design development for cooking and heating, particularly for use in schools
 - v) Research and design income-generating projects taking into consideration cultural appropriateness, existing local markets, production capabilities (quantity and quality) and the potential effects upon the family and community

Training and Education Goals

- a) Train 30 young local people as eco-tourism service and management workers

- b) Train 20 local people in mountain village economic management and development; to include the fundamentals of business management and production, distribution, and marketing issues
- c) Practical training in production techniques appropriate to the QNP economy, i.e., spinning, weaving, knitting
- d) Agricultural training development (including for vegetables and fruit production)
- e) Comprehensive training to facilitate management and development as defined by the QNP Master Plan
- f) Assistance in providing higher post-graduate education and training in forest management and biological sciences

Practical Field Models

- a) Apply the available research for re-forestation and test assumptions by planting trial forests to determine the acceptability and effectiveness of species and management techniques
- b) Develop bamboo trial forests as above
- c) Solar heating for schools
- d) Develop physical facilities (mountain hut systems, solar toilets, etc) to preserve and protect fragile and overused areas such as the Everest Base Camp, Kamma Valley, etc
- e) Complete building and equipping of the training centre inside QNP
- f) Establish an eco-tourist system and network of tourist services
- g) Domestication of selected wildlife for production of traditional medicines to minimise negative effects on species in the wild, e.g., musk deer (*Moschus chrysogaster*)

Policy and Research Appraisal and Development

- a) Develop a plan for resource use within the QNP and 12 other TAR

Forest and Wildlife Preservation Areas

- i) Appraisal and definition of available resources for all TAR Forest and Wildlife areas
- ii) Determine permissible use of forest resources, for example, maximum sustainable harvesting limit for cooking and building uses
- iii) Define potential for domestication of wildlife, as above, to preserve species in the wild
- iv) Formal appraisal of Chang Tang and Medog Nature Preserves and subsequent development of Master Plan for each

Management Department Skills' Development

- a) Management training at the Lhasa Headquarters
- b) Equipment needs include a high-quality video camera and related equipment, computers (desktop and portable), and simultaneous translation broadcast devices for conference attendees
- c) Field worker equipment to facilitate surveys, communications, and management tasks

Discussion

Regarding transboundary collaboration between two countries, **Mr. Devendra Rana**, WWF, Switzerland, asked the representative of the Tibetan Autonomous Region to share her experiences and to point out the positive points of collaboration between the Nepalese National Parks (Sagarmatha, Langtang, Makalu Barun) and the Tibetan National Parks.

The TAR Representative, **Mr.s Ban Zong** pointed out that she had had very good experiences regarding transboundary conservation which was also known as 'Join Hands'. Bahrabise was the border area on the Nepalese side and Nehlamu was the border area on



Plate 8: *Rhododendron lepidotum*

Photo: Krishna K. Shrestha

the Tibetan side. Nehlamu fell under the Qomolangma National Preserve and Bahrabise was a part of the Langtang National Park. Transboundary harvesting of fuelwood and medicinal plants and grazing of livestock were very common in the border areas. On the Nepal side, forest management was very strict, but on the Tibetan side it was not as strict because of the new management system and lack of staff. So there was no control. But now, communications had already been established through a call for a Joint Technical Meeting of the foresters. These meetings had taken place between Bahrabise and Nehlamu over the last three years. Transboundary activities had been reduced to some extent due to communications between the border areas. One meeting had already concluded this year in which the two parties were able to talk face to face about critical issues. The meeting first highlighted the problems then looked for solutions without criticism of either party. The border areas shared common problems.

The representative from the Mountain Institute, Nepal, **Mr. Brian Penniston**, pointed out that the institution had been working with the people from both the Nepal side and QNP side. There had been a series of transboundary working visits. The first visit had taken place two years previously when the representatives of QNP were invited to Nepal to visit the Sagarmatha National Park. This visit was a warden-level visit. This was the foundation for the second visit which took place in September-October the

previous year when a higher level delegation from Nepal visited Lhasa, Shigatse, and other sites within the QNP. This became the foundation for the third visit which was planned for the autumn of the current year at the working level; viz., Joint Technical Level. A six-point collaborative agenda had been developed and an agreement had been signed, focussing more on the common problems and the common solutions and not on criticising each other, in Shigatse in September. The points that were touched upon in the third level meetings were illegal trade issues, control of wildfires, and transboundary grazing. So they had gone from the working level to policy level to local level. Now, the next series of transboundary exchanges would focus on resolving common problems at the local level. On the Nepal side, they were focussing on the local people of Langtang National Park, currently, because the TAR officials were interested in exploring transboundary tourism in the Kerong Valley as well.

The representative from Sikkim, Mr. Gut Lepcha, pointed out that the transborder migratory species in Sikkim were Tibetan Antelopes and Greater Tibetan Sheep, which sometimes came to Sikkim and sometimes went to China. Therefore, there were certain problems concerning the protection of these endangered species. What were the measures that China had taken to protect these endangered species?

The representative from the TAR pointed out that there had been two measures taken for the protection of endangered species in China.

- a) Educating the local people about national protection of wildlife. Ninety-five per cent of the local people were already aware or educated. They had established their own monitoring system to control poaching.

They reported to the National Preserve Management System.

- b) Poachers were fined and punished if they were caught.

Chairperson's Remarks

The Chairperson mentioned that there were three issues on the Conservation of the Kanchanjunga Mountain System. The current situation was uneven. The Sikkim side had already established a well-managed system for the protection of the Kanchanjunga Mountain System. In Nepal, the government had already approved of and was on the verge of declaring a Kanchanjunga Conservation Area in the near future. Some basic field surveys, such as those on wildlife and vegetation, had already been carried out by concerned scientists. On the China side, the Kanchanjunga area was under the QNP. The management was not very intense in that part of the area, due to inaccessibility and remoteness, and also the vegetation was very simple and little study had been carried out in this area. This area had a very good fundamental basis for future development. The area was important from two aspects. In terms of botanical history, Sikkim was one of the most important areas in the eastern Himalayas for its high plant biodiversity; with 7,000sq. km. of area having more than 7,000 species of plants and many endemic and local medical species which were highly endangered. Secondly, this area had a large number of ethnic groups, so when one talked about conservation of biodiversity one should not forget about conservation of cultural diversity. We must work hard to push for conservation of Kanchanjunga as a large transboundary protected area by keeping these two important factors in mind. The Chairperson closed the session in thanking the three speakers and the participants.

Day One

Technical Session Two

Chairperson
Dr. R.K. Rai

The Himalayan region is the largest mountain system in the world, with unique functions and roles in the context of biodiversity. A comprehensive programme for the conservation of biodiversity in Nepal was introduced in 1992. As a result, eight national parks, one hunting reserve, and two conservation areas encompassing over 22.74 per cent of its land area. Although most of the important highland areas are already covered within the protected area system, the designation of one new protected area – The Kanchanjunga Conservation Area, in the north-eastern corner of Nepal, is in the advanced stages.

A feasibility study of biological, social, and cultural diversity and a forest inventory of the proposed Kanchanjunga Conservation Area were carried out by the WWF Nepal Programme in 1994.

The study area is situated in the Taplejung district, near the border with Yampudin, Tibet. The study area was surveyed for the project. The study reports. His Majesty's Government of Nepal has endorsed a project proposal to declare the Kanchanjunga region a protected area. It is now almost finalised that this area will be officially declared a Conservation area by the end of 1997. Establishment of the Kanchanjunga Conservation Area (KCA) will increase Nepal's protected area by 2,000 sq km, thereby expanding the total protected area from 22.74 to 24.74 per cent of the total area.

The Kanchanjunga Conservation Area

The proposed Kanchanjunga Conservation Area lies in the Taplejung district, the north-east corner part of the country, bordered by Sikkim (India) in the east and Tibet (China) in the north. Previously, the proposed area of the

A BRIEF ACCOUNT OF THE VEGETATION AND FLORA OF THE KANCHANJUNGA CONSERVATION AREA

K.K. SHRESTHA AND PEI SHENGJI

Introduction

The Himalayan region is the largest mountain system in the world, with unique functions and roles in the context of biodiversity. A comprehensive programme for the conservation of biodiversity in Nepal was introduced in 1972 by the formulation of a *National Parks and Wildlife Conservation Act*. Nepal's current network of eight national parks, four wildlife reserves, one hunting reserve, and two conservation areas encompasses over 13.74 per cent of its land area. Although most of the important highland areas are already covered within the protected area system, the designation of one new protected area - The Kanchanjunga Conservation Area, in the northeastern corner of Nepal, is in the advanced stages.

A feasibility study of biological, social, and cultural diversity and a forest inventory of the proposed Kanchanjunga Conservation Area were carried out by the WWF Nepal Programme in 1994

and 1996, respectively. Five Village Development Committees (VDCs) of Taplejung district, namely, Mamankhe, Yamphudin, Tapethok, Lelep, and Olangchung were selected and surveyed for the project area. Based on these reports, His Majesty's Government of Nepal has endorsed a project proposal to declare the Kanchanjunga region a protected area. It is now almost finalised that the area will be officially declared a Conservation area by the end of 1997. Establishment of the Kanchanjunga Conservation Area (KCA) will increase Nepal's protected area by 2,000sq.km., thereby expanding the total protected area from 13.74 to 15.11 per cent of the total area.

The Kanchanjunga Conservation Area

The proposed Kanchanjunga Conservation Area lies in the Taplejung district, the northeastern-most part of the country, bordered by Sikkim (India) in the east and Tibet (China) in the north. Previously, the proposed area of the

KCA was 2,011sq. km. (Shrestha 1994), covering 1.37 per cent of the total area of the country and 55.2 per cent of Taplejung district, but the revised area of the conservation area is ca. 1,650sq. km. (Anonymous 1996). The area represents high mountain physiographic regions with 65 per cent of its area covered by rocks and ice. The remaining 35 per cent of the area is covered by forests (14.1%), shrubland (10.1%), grassland (9.2%), and agricultural land (1.6%).

Photo: Krishna K. Shrestha



Plate 9: *Holboellia latifolia* ('Gufala'): Amjelassa (2,400m)

The altitude varies between ca. 1,200m (in the south) to 8,586m at the top of Mount Kanchanjunga. The climate varies from subtropical monsoon at the lower elevations to alpine. The area is well known for its three major river valleys: the Simbua *Khola* and the Ghunsa and Tamur valleys. These valleys are distinct from one another in that they possess varied forest types and floristic elements. The wide diversity of plants in this region is due to the presence of diverse ecological habitats such as marshes, river gullies, steep slopes with crevices, verdant valleys, and dry alpine grasslands. The area is phytogeographically interesting due to the presence of many Sino-Japanese and Sino-Himalayan elements.

Vegetation

Due to the diverse topography, altitude, soil, climate, and aspect, Nepal exhibits different types of vegetation

ranging from tropical and subtropical to temperate, subalpine, and alpine. Taplejung district exhibits all the vegetation and forest types of Nepal, including upper tropical forests of hill Sal (*Shorea robusta*) in the south to the *Schima* (*Schima coallichii*), *Castanopsis* (*Castanopsis* spp), and Oak (*Quercus* spp) forests in the middle hills and dense coniferous forests of *Abies*, *Tsuga*, and *Juniperus* in the higher hills to bushes of *Rhododendron* spp in the upper subalpine to alpine grasslands. It is estimated that the forest cover in the KCA is about 14 per cent. The forests are very disturbed in the Ghunsa Valley and less degraded in the Tamur Valley, however, in Simbua *Khola* Valley, the forests are comparatively intact and virgin.

Several eastern Himalayan species are widely available here and extend up to Central Nepal. However, these species are widely recorded from other parts of the Himalayas, i.e., Sikkim, Bhutan, and S.E. Tibet. Examples of such elements include *Acer pectinatum*, *Berberis insignis*, *Castanopsis hystrix*, *Corylus ferox*, *Daphne bholua*, *Edgeworthia gardneri*, *Gaultheria hookeri*, *Larix griffithiana*, *Lithocarpus pachyphylla*, *Magnolia campbelli*, *Quercus lamellosa*, and several species of *Rhododendron*. Among them several species are endemic to eastern Nepal.

Kanchanjunga Conservation Area is represented by subtropical vegetation in the lower mid-hills to alpine grasslands in the high hills and mountains. The vegetation types, with important associated species, are as follow (Dobremez and Shakya 1975; Shrestha 1994; Shrestha and Ghimire 1996).

***Subtropical Bioclimatic Belt* (1,000 - 2,000m)**

Subtropical Evergreen to Semi-evergreen Forests: Tapethok-Hellok;

Yamphudin Mamankhe (1,100 - 1,700m): The characteristic species of this type of forest are *Schima wallichii*, *Engelhardtia spicata*, *Macaranga pustulata*, *Castanopsis indica*, *Betula alnoides*, *Saurauia nepalensis*, and *Rhododendron arboreum*.

Schima wallichii - *Castanopsis tribuloides* Forests: Tapethok, Lelep, Yamphudin (1,500 - 2,000m): Common tree species are *Schima wallichii*, *Castanopsis tribuloides*, *C. hystris*, *Quercus glauca*, *Q. incana*, *Rhododendron arboreum*, and *Lyonia ovalifolia*.

Castanopsis tribuloides-*Castanopsis hystris* Forests: Mamanke, Yamphudin (1,600 - 2,300m): A characteristic forest of the eastern Himalayas is comprised of species such as *Castanopsis tribuloides*, *Castanopsis hystris*, *Rhododendron arboreum*, *Lyonia ovalifolia*.

Temperate Bioclimatic Belt (2,000 - 3,000m)

Oak-Laurel Forests: Iladanda, Amje Khola (2,300 - 2,500m): Dominant species of this forest are *Quercus glauca*, *Quercus lamellosa*, *Persea duthie*, *Castanopsis tribuloides*, *Machilus* sp, and *Lindera pulcherrima*.

Quercus lamellosa Forests (2,100 - 2,800m): This forest is predominantly abundant on the ridges that flank the upper Tamur. The characteristic species are *Quercus lamellosa*, *Q. lineata*, and *Castanopsis tribuloides*.

Quercus semecarpifolia Forests: Amjelassa-Thangyang (2,300 - 3,000m): The characteristic species of such degraded and disturbed forests include *Quercus semecarpifolia*, *Rhododendron arboreum*, *Lyonia ovalifolia*, and *Arundinaria maling*.

Mixed Broad-leaved Forests: Thangyang - Gyapla - Pholay (2,500 - 3,000m): *Quercus semecarpifolia*, *Tsuga dumosa*, *Abies spectabilis*,

Quercus lamellosa, *Betula utilis*, *Acer* spp, *Rhododendron arboreum*, and *Corylus ferox*.

Lithocarpus pachyphylla Forests (2,600 - 3,150m): An east Himalayan species, only present in the extreme east of the country between the Tamur and the Sikkim border. Characteristic species include *Quercus lamellosa*, *Q. lineata*, *Hydrangea heteromala*, *Arundinaria maling*, *Rhododendron grande*, and *Magnolia campbellii*.

Sub-alpine Bioclimatic Belt (3,000 - 4,000m)

Tsuga dumosa - *Abies spectabilis* Forests: Pholay-Ghunsa, Dorangding (3,000 - 3,500m): *Tsuga dumosa*, *Abies spectabilis*, *Betula utilis*, *Juniperus indica*, *Juniperus recurva*, *Magnolia campbellii*, *Rhododendron campanulatum*, and *Rhododendron arboreum*

Abies spectabilis Forests: Ghunsa-Khambachen, Chairam (3,400 - 3,800m): *Abies spectabilis*, *Betula utilis*, *Juniperus indica*, and *Rhododendron campanulatum*

Larix griffithiana Forests: Ghunsa - Khambachen (3,200 - 3,900m): *Larix griffithiana*, *Abies spectabilis*, *Juniperus indica*, and *Betula utilis*

Juniperus indica Forests: Ghunsa - Khambachen, Chairam-Yalung (3,400 - 4,050m): *Juniperus indica*, *Abies spectabilis*, *Betula utilis*, and *Juniperus recurva*

Rhododendron Forests: Gyapla-Olangchung, Ghunsa-Selele, Dorangding-Lase (3,000 - 3,600m): *Rhododendron hodgsonii*, *Abies spectabilis*; *Rhododendron falconeri*, *Rhododendron barbatum*, *Rhododendron arboreum*, *R. campanulatum*, *Betula utilis*, and *Salix* spp.

Betula utilis Forests: Kambachen, Ghunsa - Selele (3,800 - 4,000m): This type of forest occurs near the

timberline of the Kanchanjunga area. Most common species of this forest include *Betula utilis*, *Abies spectabilis*, and *Rhododendron* spp.

***Alpine Bioclimatic Belt* (above 4,000m)**

Alpine Scrub: Kambachen-Lhonak, Selele, Yangma-Ramche (>4,000m): *Rhododendron anthopogon*, *Rhododendron setosum*, *Juniperus squamata*, *Rhododendron lepidotum*, and *Berberis* spp

Alpine Pasture or Meadow (Kambachen, Selele, Ramche: 4,200 - 4,600m): *Juncus effusus*, *Agrostis myriantha*, *Festuca rubra*, *Poa himalayana*, *Poa annua*, *Trisetum spicatum*, and *Carex* spp.

Flora

Approximately 3,000 species of flowering plants were reported from eastern Nepal, constituting about 60 per cent of the flowering plants of Nepal (Hara *et al.* 1978 - 1982). The Kanchanjunga area's diverse climate and topography bestow on it tremendous floristic diversity with approximately 2,000 species of flowering plants. Several plant collectors have explored the area since 1848 (Hooker 1854; Banerji 1965; Hara 1966; Numata 1975; Dobremez and Shakya 1975; Suzuki and Noshiro 1993; Shrestha 1994; and Shrestha and Ghimire 1996).

A partial list of flowering plants of Taplejung and the Kanchanjunga Conservation Area indicated the presence of 1,284 and 810 species of flowering plants respectively (Shrestha and Ghimire 1996). Although Kanchanjunga area covers only 1.48 per cent of the total land area of the country, it has a 16 per cent share in terms of the total flora of Nepal. The largest families in the Kanchanjunga Conservation Area are *Compositae* (56

spp), *Leguminosae* (51 spp), *Orchidaceae* (48 spp), *Rosaceae* (45 spp), *Ericaceae* (42 spp), and *Gramineae* (40 spp). Similarly, the largest genera are *Rhododendron* (23 spp), *Rubus* (14 spp), *Pedicularis* (10 spp), and *Primula* (10 spp).

Endangered and Endemic Species

Many species in Nepal are threatened because of several factors. Shrestha and Joshi (1992) listed 60 species of flowering plants as threatened species in Nepal. In the present study, 13 species of threatened plants are reported from Kanchanjunga and the surrounding areas. It was observed that one species is considered to be endangered (*Michelia kisopa*), three species to be commercially threatened (*Aconitum spicatum*, *Bergenia ciliata*, *Larix griffithiana*), five species belong to the vulnerable category (*Choerospondias axillaris*, *Nardostachys grandiflora*, *Paris polyphylla*, *Picrorhiza scrophulariiflora*, *Swertia chirayita*), and two species belong to the rare category (*Tetracentron sinense*, *Ulmus wallichiana*).

Shrestha and Joshi (1996) also listed 246 species of flowering plants as the endemic plants of Nepal. The majority of the species are reported from Central Nepal and a total of 68 species of endemic flowering plants occur in eastern Nepal. Twenty-three species of endemic flowering plants have been recorded so far from the Kanchanjunga and its surrounding areas, 11 species of which are reported from the Kanchanjunga Conservation Area. The common endemic species are *Aconitum alpine-nepalense*, *Aconitum staintonii*, *Begonia leptoptera*, *Cotoneaster staintonii*, *Euphorbia pseudosikkimensis*, *Glochidion metanubigenum*, *Impatiens insignis*, *Microtoena nepalensis*, *Pedicularis tamurensis*, *Poa imperialis*, *Stellaria ovalifolia*, and *Strobilanthes*

tamburensis. It is obvious that most of the species are reported from the western part of Taplejung along the Tamur and Mewa rivers.

Exploitation of Plant Resources

The plant resources are encroached upon by humans (grazing of livestock, tree cutting, fires) throughout the Kanchanjunga area. Human encroachment is particularly high in the middle hills where the prime forest area is being converted into cultivable land.

Chiraito is used extensively for curing colds, coughs, and fever. Similarly, the firewood species used extensively are *Alnus nepalensis* (*utis*) and *Eurya acuminata* (*jhingano*) followed by *Quercus incana* (*banjh*), *Q. glauca* (*phalant*), *Castanopsis indica* (*dhalne katush*), *Engelhardtia spicata* (*mauwa*), and *Schima wallichii* (*chilaune*) in the middle hills (1,000-2,500m); and in the higher hills (2,500-4,000m) they include *Rhododendron campanulatum* (*chimal*), *Juniperus recurva* (*dhupl*),



Photo: Krishna K. Shrestha

Plate 10: *Juniperus indica* (Juniper) Forest Tseram (3,000m)

In addition, slash-and-burn practices were found to be the prominent factor in the depletion of biodiversity. Collection of firewood, timber, and medicinal herbs indiscriminately, in the middle hills particularly, has threatened some of the important plant species.

In many places, especially in the higher hills, traditional medicinal plants such as *chiraito* (*Swertia chirayita*), *kutki* (*Picrorrhiza scrophulariiflora*), *paanchaunle* (*Dactylorhiza hatagirea*), and *pakhanved* (*Bergenia ciliata*) are used to some extent, whereas in the middle hills they seldom use local herbs as medicines, they either prefer a lama (*jhar phook*) or modern allopathic medicines. It is noticed that only

Betula utilis (*bhoj patra*), and *Quercus lamellosa* (*bajranth*). However, *Rhododendron arboreum* (*gurans*) and *Lyonia ovalifolia* (*angeri*) are the most popular firewoods in the lower as well as the higher hills.

Conclusion and Recommendations

Conservation of biodiversity calls for both global attention and prompt action at the regional level. The Kanchanjunga Area harbours a unique and enormous diversity in terms of ecosystem, fauna and flora, and cultural aspects, and many floristic elements unique to the country are restricted to this part of Nepal. The typical east Himalayan types of vegetation restricted to this area are *Lithocarpus*

pachyphylla forests, *Larix griffithiana* forest, and *Castanopsis hystris* forests. The presence of large numbers of *Rhododendron* species (there are several endemic and rare species in the Kanchanjunga area) reinforces the belief that this pristine area of the country should be included in the protected area system. It is thus recommended that a special conservation programme be launched to conserve and protect the unique flora and vegetation of the Kanchanjunga area.

References

- Anonymous, 1996. *Brief Information on Kanchanjunga Conservation Area*. Kathmandu, Nepal: WWF Nepal Programme.
- Banerji, M.L., 1965. 'Contribution to the Flora of East Nepal'. In *Rec. Bot. Surv. India* Vol. 19 (2): 1-90.
- Dobremez, J.F. and Shakya, P.R., 1975. 'Ecological Map of Nepal 6. Biratnagar - Kanchanjunga Area, 1/250000'. In *Doc. Carte Ecol.* 16, pp 33-48, Grenoble, France.
- Hara, H., 1966. *The Flora of Eastern Himalaya. Part 1*. Tokyo: University of Tokyo Press.
- Hara, H., Stearn, W.T. and Williams, L.H.J., 1978. *An Enumeration of the Flowering Plants of Nepal. Vol. 1*. London: British (Natural History) Museum.
- Hooker, J.D., 1854. *Himalayan Journals*. Himalayan Journals Vols. 1-2. London: J. Murray.
- Numata, M., 1975. 'Ecological Studies in the Nepal Himalayas'. In: Numata, M. (ed), *Structure and Dynamics of Vegetation in Eastern Nepal*. Japan: Faculty of Science, Laboratory of Ecology Chiba University.
- Shrestha, K.K., 1994. *Floristic Diversity, Vegetation and Ethnobotany of the Proposed Kanchanjunga Conservation Area*. WWF Nepal Programme, Report Series # 6. Kathmandu, Nepal: WWF Nepal Programme.
- Shrestha, K.K., and Ghimire, S.K., 1996. *Plant Diversity Inventory of the Proposed Kanchanjunga Conservation Area (Ghunsu and Simbuwa Valley)*. Report Series # 22 Kathmandu, Nepal: WWF Nepal Programme.
- Shrestha, T.B. and Joshi, R.M., 1996. *Rare, Endemic and Endangered Plants of Nepal*. Kathmandu, Nepal: WWF Nepal Programme.
- Suzuki, M. and Noshiro, S., 1993. 'Japan - Nepal Cooperative Botanical Research in East Nepal'. In M. Suzuki (ed), *Wood Anatomical Expeditions in Nepal Himalaya, pp21-27*. Japan: Kanazawa University.

A REPORT ON WILDLIFE ISSUES IN THE KANCHANJUNGA REGION

DEVENDRA AMATYA

Background

This report is based on studies carried out by WWF consultants, Lhakpa Norbu Sherpa and Dr Prahlad Yonjon, on wild mammals; Dr Chris Carpenter, on birds; and the author's observations in the Kanchanjunga area in Autumn 1994 and the summer of 1996 (Annex 1).

Wildlife Assessment

The methodology of wildlife assessment has been described in detail by Sherpa (1994) and Yonjon (1996). In general, both wildlife biologists based their studies on direct observation, interviews, habitat study, signs such as scats and droppings, and available literature. Sherpa (1994) prepared a list of mammals known or suspected to occur in the Kanchanjunga area.

However, Yonjon (1996) used land-use patterns to describe the key wildlife and their habitats in the Kanchanjunga region. Six land-use groups are recognised as wildlife habitats and used for analysis. These land-use groups are

agricultural area, barren land, shrubs, hardwood forests, conifer forests, and grazing areas.

Agricultural Area

Agricultural land constitutes 4.33sq. km. (0.27%) of the total area. About 94 per cent of this land is situated below 2,000m. Among the main wildlife found below this altitude are the rhesus macaque (*Macaca mulata*), gray langur (*Presbytis entellus*), and Himalayan black bear (*Selenarctos thibetanus*). Porcupines (*Hystrix indica*) have also been seen.

Hardwood

The total area of hardwood forest is 51.85sq.km. (3.2%). The *Schima* and *Castanopsis* forests below Amjilhasa were quite degraded. Excellent oak (*Quercus spp*) and *Rhododendron* forests interspersed with ringal bamboo occurred between Amjilhasa and Pholey. Fifteen large mammals use different habitats in the hardwood forests. These mammals included yellow-throated marten (*Martes*

flavigula), smooth otter (*Lutra perspicillata*), Himalayan black bear (*Selenorctos thibetanus*), fox (*Vulpes bengalensis*), jackal (*Canis aureus*), jungle cat (*Felis chaus*), leopard cat (*Felis bengalensis*), common leopard (*Panthera pardus*), serow (*Capricornis sumatraensis*), goral (*Nemorhaedus goral*), and barking deer (*Muntiacus muntjac*). The local people said many of these mammals were commonly sighted.

Conifers

The Conifer forests were comprised of *Abies spectabilis*, *Betula utilis*, *Tsuga dumosa*, *Juniperus wallichiana*, *Acer* spp, and *Larix griffithiana*. These forests may intermittently occur with deciduous mixed, broad-leaved species. The total area of conifer forests is 84.16sq.km. (5.3%). The majority (89.8%) of conifer forests occur between 3,000-4,000m; very few conifers exist above 4,000m (1.3%). Dense conifer forests occur between Gyapla and Ghunsa, from Ghunsa to Yamotari Glacier, and from Tseram - Toranden to Deorali Danda.

Almost all mammal species inhabiting hardwood forests occurred, with the exception of the *Rhesus macaque*, *Assamese macaque*, smooth otter (*Lutra perspicillata*), small Indian civet (*Viverricula indica*), and the porcupine (*Hystrix indica*). Additional large mammals include musk deer (*Moschus chrysogaster*) and red panda (*Ailurus*

fulgens), which are among the protected species of Nepal.

At Toranden (3,124m), leopard scat that contained the claws of a young jungle cat was collected. Along a two-km stretch between Toranden and Deorali Kharka (3,525m), 18 groups of goral pellets and four musk deer pellets were observed (Yonjon 1996). We also saw a few children at Yamphudin playing with a red panda pelt.

In the Simbuwa Khola Valley, some 200ha of pure stands of juniper (*Juniperus indica*) are found in Tseram where goral and monal pheasants were seen.

Shrubs

Shrubs totalling 141.73sq.km. (8.8%) were distributed below 5,000m. Shrubs were predominant between 2,000m- 4,000m (87%). LRMP (1986) describes shrubs as vegetation which may include hardwood regeneration. Above 3,000m, shrublands are dominated by *Rhododendron* and *Juniperus* spp. Alpine shrublands may harbour serow and musk deer in summer, as well as a host of small mammals such as beach marten (*Martes foina*) and pika (*Ochotona* spp). Such shrublands also provide excellent winter habitats for blue sheep (*Pseudois nauyaur*).

Grazing Area

Grazing land covers some 169sq.km. (10.5%) in the Kanchanjunga region below 5,000m. Grazing area expansion is the largest between 3,000 - 4,000m, covering some 118.87sq.km. with patches of pasture as large as 46sq.km.; in these areas, *clamastris* sp, *carex* sp, *festuca*, and *trisetum* sp are important.

In the upper reaches of the Ghunsa (Khambachen) and Simbuwa khola(s) (Yalung and Ramje), Yonjon (1996) observed a total of 78 blue sheep in eight different herds, averaging 9.75 ani-



Plate 11: Himalayan Blue Sheep

Photo: Ravi Sankaram

mals per herd (herd size 1 - 24). The male-female ratio was 96:100 and the yearling and lamb ratio were 56 and 60 per 100 females, respectively.

Snow leopard (*Panthera uncia*) scat was found at 4,376m towards Mirgin La and tracks on the snow were evident at 4,500m. Although there is no definitive information on the snow leopard population, at least four adults were evident in these three valleys as reported by Taylor (1995). In addition, a beech marten (*Martes foina*) was observed in Ramje at 4,290m.

Barren Land

Barren land occurs above 3,000m, covering an area of 1,151sq.km. (71.8%). Between 5,000 - 6,000m, land expands to a maximum area of 672sq.km., providing optimal escape cover for blue sheep above 4,000m, as well as providing snow leopard habitat.

Snow leopards are usually found only in subalpine and alpine regions, away from major human habitations. Their seasonal migration pattern often follows the migration patterns of prey species.

The Grey wolf (*Canis lupus*) is another predator of the alpine and subalpine regions whose range overlaps that of the snow leopard.

Assessment of Birds

The eastern Himalayas (Kanchanjunga area) support a wide diversity of bird species. This is due to the complex physiography and bioclimatic zonation (Ives and Messerli 1989) and their location at the convergence of the Palearctic and Oriental Zoogeographic Realms (Inskipp 1989). The eastern Himalayas are also identified by Birdlife International as a Priority I Endemic Bird Area since they support 25 restricted range bird species, of which 21 are confined to the region (Bibby 1992).

Photo: Devendra Amatya



Plate 12: Ghoral Habitat in Helok (2,500m)

Dr. Charles Chris Carpenter (Carpenter 1996) with his students from Wildland Studies, San Francisco State University, College of Extended Learning, visited the Kanchanjunga area four times for a six-week duration each between 1994 and 1996 and studied the altitudinal distribution of 251 bird species.

Out of 251 bird species, Carpenter (1996) found 123 species to be frequent species, 59 species to be long-distance migrating species, and 69 species to be common residence species.

He recorded the greatest number of birds during the autumn at 1,300masl, whereas during spring he found the greatest number at 2,700masl.

There are eight bird species which are considered to be at risk in Nepal and listed by IUCN as rare, vulnerable, or endangered. Five of them were recorded in the temperate forest above the elevation of agricultural activities. These include the Satyr Tragopan (*Tragopan satyra*), Fulvous Parrot Bill (*Para-doxornis fulvifrons*), Cutia (*Cutia nipalensis*), White-browed Shortwing (*Brachypteryx leucophrys*), and Little Pied Flycatcher (*Ficedula westermanni*). The other three species at risk were recorded at lower elevations where subsistence agriculture is widespread. These include the Forest Ea-

gle Owl (*Bubo nipalensis*), Short-billed Minivet (*Pericrocotus brevirostris*), and Grey-cheeked Warbler (*Seicercus poliogenys*).

Wildlife Conservation Issues

Crop Damage

The incidence of crop raiding by wildlife below 1,500m is extremely high; damage was done mainly by the rhesus macaque (*Macaca mulata*), grey langur (*Presbytis entellus*), and the Himalayan black bear (*selenarctos thibetanus*). Also, loss of cardamom bushes because of porcupines (*Hystrix indica*) was reported to be heavy.

Above 1,500m, crop-raiding species include the Assamese macaque (*Macaca assamensis*), grey langur, and the Himalayan black bear. In Amjilhasa (2,500m), barking deer (*Muntiacus muntjac*) and goral (*Nemorhaedus goral*) eat the crops. This is an exceptional case in the Kanchanjunga region because the local inhabitants, primarily the *Bhotia*(s) in this village, do not hunt and trap. Farmers posted scarecrows and made smoke in the evenings by burning farm residue to keep away the wild animals.

A woman informant at Hellok said that crop raiding above 2,000m by Assamese macaque was common, as opposed to rhesus macaques (*Macaca mulatta*) which were prevalent in agricultural areas below 1,300m.

Livestock Depredation

Livestock depredation is caused mainly by jackals (*Canis aureus*), foxes (*Vulpes bengalensis*), yellow-throated martens, (*Martes flavigula*), and jungle cats (*Felis chaus*).

Villagers said the common leopard was once numerous but has declined in recent years, probably because of hunting and trapping. Livestock depredation by leopards was not reported.

West of Sele La, two sub-adult yaks were mauled by a snow leopard at Kurlung Kharka (4,115m). Informants stated that domestic sheep become more vulnerable to snow leopards in the monsoon as the sheep move higher up.

Wegge (1991) reported 5-10 yak losses to snow leopards each year. However, all these kills may not be by snow leopards. The grey wolf preys on some of the same species preyed upon by snow leopards, resulting in competition.

Wolves prey on livestock and are thus persecuted by people. Poison, traps, and guns are used to eliminate the wolf. Wolf dens are tracked down using dogs and cubs are killed. In Amjilhasa, one herder reported that two sheep were killed by a Tibetan mastiff. One suspects that it must have been a grey wolf.

Overgrazing

The people of Olangchung Gola, Ghunsa, Gyapla, Pholey, and Amjilhasa of the Kanchanjunga area — all of them of Tibetan origin — use alpine pastures to graze their yak herds in the summer. Amjilhasa and Gyapla herders used the pastures between Olangchung Gola and Pholey, Pholey herders use areas up above Khambachen, and Olangchung Gola and Ghunsa herdsman use Tseram, Yalung, and Ramje — the upper reaches of the Simbuwa Valley — as their pasture land. In addition, people from adjoining regions bring thousands of sheep into the Kanchanjunga area for summer grazing for up to eight months.

All pasture land between Khambachen and Pangpema, Yamotari Glacier and Mirgin La, and Yalung and Oktang are intensely grazed by yaks and sheep. Yak population figures are not available; conflicts emerging while practising traditional grazing rights under the

Kipat system are not fully understood. However, it appears that the Kanchanjunga region supports a large population of high-altitude cattle and sheep. This is evident from the recent levels of snowstorm mortalities. For example, Dawa Chind, a cattle owner from Ghunsa, lost 60 yaks in the November 1995 snowstorm. He suspected that at least 160 yaks had died in Ghunsa and places above (Yonzon 1996).

The impacts of grazing in these areas are not well understood and the available reports appear to be contradictory. Carpenter et al. (1994) stated that the alpine meadows were under tremendous grazing pressure. Contrarily, Wegge (1991) suggested that cattle numbers were not in excess and vegetation did not show grazing pressure. However, Nyima Sherpa of Ghunsa recalled large numbers of yaks and sheep in the Sele La Pokhari — he stated that he had not seen any blue sheep herds with more than 10 animals for several years. Although yak herds were to arrive in late May - early June, the distance between stray yaks and all blue sheep herds observed during the survey in April averaged 330m, suggesting diet overlap and perhaps a possibility for competition in summer (Yonzon 1996).

Hunting

Hunting is common among the local *Rai*, *Limbu*, and *Gurung* ethnic communities. In some cases it is integrated into their cultural traditions. More recently, economic incentives have led to increased hunting in the area. It was learned that a large section of the community hunt to earn supplementary income. *Rai*(s) and *Limbu*(s) are avid hunters and hunting is integrated into their cultural traditions and subsistence economy. A key informant at Hellok recalled that primarily goral, serow, barking deer, and black-backed

kalij (*Lophura leucomelana*) were hunted.

The *Walungpa*(s), *Bhote*(s), and *Sherpa*(s) of the Kanchanjunga region may trap and hunt, but they are so discreet that their activities are hardly noticed. On the contrary, the *Limbu*(s) and *Rai*(s), as avid hunters by tradition, are strongly associated with gun - bearing. For example, all 250 *Limbu* and eight *Rai* households in Hellock village hunt regularly (key informant). A small hunting party may consist of four persons and two dogs. We also observed a small party of three boys, all less than 15 years of age, with shotguns. Nearby areas like Sekathum (1,500m) were no different; we heard several gunshots resound throughout the village (although the fact that villagers were also firing shots to celebrate the Nepalese New Year that day must be considered). On the other side of the valley, a similar situation prevailed between Dhupi *Danda* and Yamphudin at 1,700m.

Hunting appears to be rampant. Yonzon (1996) noted that there is a need to address this issue. While curbing such activities, alternatives must be sought in terms of nutrition, as wildlife may constitute one of the major sources of protein. There are quite a few professional hunters who will be affected if hunting restrictions are implemented and enforced. These hunters' expertise can be tapped by the proposed Kanchanjunga Conservation Area (KCA) management team by employing them as field staff.

Before resuming blue sheep harvesting on a sustained-yield basis, their status in the entire Kanchanjunga region must be determined. Once such a baseline is established, a viable scheme of sustainable harvesting can be implemented with intermittent monitoring. Revenue from such an activity may contribute to community



Photo: Ajay Rastogi

Plate 13: Himalayan Blue Sheep Trophy

programmes aimed at poverty alleviation.

A total ban on the hunting of blue sheep should remain in effect in those areas frequented by trekkers, because non-consumptive wildlife values are long-term and can reach a wider mass in such areas.

Harvesting blue sheep on a sustained-yield basis is needed to benefit the local communities. However, hunting should be totally prohibited in all trekking-related areas.

The absence of a balanced male-female ratio is indicative of a disturbed population. This corroborates the fact that blue sheep hunting was licensed by the government between 1979-1994. It is understood that about two to three hunting license have been issued each year since that time; however, the number of animals slaughtered is not reflected by this minimal number of permits. Guli Sherpa, a member of Gyapla Village, Ward No. 8, and one of the *shikari(s)* (game scouts) hired by the two Kathmandu-based outfitters, stated that one government permit led to the shooting of at least four blue sheep. As hunting clients arrive by helicopter, there was very little the District Forest Office (DFO) at

Taplejung Bazar could do to monitor these groups' activities. Most of the *shikari(s)* were Tibetan refugees from Lelep, adjoining Hellock.

Illegal hunting of blue sheep by locals exists (Carpenter et al., 1994; Sherpa 1994; Wegge 1991). The Tibetan communities in Pholey and Gypla possess guns, and herders from Pholey use traps and snares to kill blue sheep. Government staff at Ghunsa also hunt blue sheep, but their activities are not reported for fear of persecution. Yamphudin herders had trapped a few blue sheep with salt and nooses. During the survey, herders sold a blue sheep skull with its horn for NRs 500.

Snow leopards are killed by farmers because they predate on livestock. The animal is also sought for its beautiful pelt which is used to make fur coats.

Tourism

Tourism is slowly growing, but only through organised trekking. This is because of the poor tourism infrastructure in the area. However, the potential for organising and expanding community tourism is enormous. While developing tourism, threats to both natural and cultural resources must be monitored by local communities. Such

participatory management programmes do not weaken land ownership and management, but rather promote rights to use the productivity of such resources in exchange for protection (Yonzon 1993).

A well-developed tourism infrastructure will improve the strength of the community and may address long-term employment needs through guiding and portering opportunities that would arise for marginalised people.

Inventory and Baseline Data

Some inventory and baseline data have been collected. However, there is a need for more information to monitor environmental quality and economic improvements. The importance of integrating biological conservation with economics cannot be overemphasised. Therefore, ways to diminish threats to biodiversity, subsistence agriculture, and livestock are vital for maintaining the Kanchanjunga region's resources. Only with such information can probable steps towards managing wildlife and sustainable development be implemented successfully.

Knowledge of the traditional grazing patterns of yak and sheep herds will be essential for preparing a management plan for the Kanchanjunga region.

References

- Bibby, C.J., 1992. *Putting Biodiversity on the Map: Priority Areas for Global Conservation*. Cambridge, U.K.: International Council for Bird Preservation.
- Carpenter, C.; Bauer, K.; and Nepal, R., 1994. *Report on Flora and Fauna of the Kanchanjunga Region*. Wildland Study Programme, San Francisco State University. Report Series # 14, Kathmandu: WWF Nepal Programme.
- Carpenter, C.C., 1996. 'Pattern of Bird Species Richness in the Tamur River Basin: Seasonal and Elevation Trends'. Wildland Studies, San Francisco State University, College of Extended Learning. Submitted to Conservation Biology on October 1996.
- Inskipp, C., 1989. *Nepal's Forest Birds: Their Status and Conservation*. International Council for Bird Preservation Monograph No. 4. Cambridge U.K.: ICBP.
- Ives, J.D. and Messerli, B., 1989. *The Himalayan Dilemma: Reconciling Development and Conservation*. London: Routledge.
- LRMP, 1986. *The Land Use Report, Land Resource Mapping Project*. Kathmandu, Nepal: Department of Survey.
- Sherpa, L.N., 1994. *Preliminary Assessment of the Wildlife Conservation Values of the Kanchanjunga Area*. Report Series # 7. Kathmandu: WWF Nepal Programme.
- Taylor, B., 1995. Personal Communication.
- Wegge, P., 1991. *Survey of Kanchanjunga Area in NE Taplejung District of Nepal. Report on WWF Project 4102/Nepal*. Kathmandu: WWF Nepal Programme.
- Yonzon, P.B., 1996. *Status of Wildlife in the Kanchanjunga Region: A Reconnaissance Study Report*. Report Series # 23. Kathmandu: WWF Nepal Programme.

Attachment to Paper

Field Visit in September 1994

The study was limited to the Ghunsa *Khola*, Simbuwa *Khola*, and Tamur River valleys. The first study route followed Gopetar (1,300m), Sinam (1,100m), Yamphudin (1,700m), Gairibas (2,700m), Deurali Pass (3,345m), Hellok (1,600m), Sekathum (1,500m), Amjilhasa (2,500m), Pholey (3,000m), Ghunsa (3,340m), Gypla (2,720m), Hanspokhari (4,150m), Jongim (2,600m), Olangchung Gola (3,150m), Lungthung (1,800m), Chiruwa (1,300m), Mitlung (960m), and Taplejung Bazar (1,800m).

Field Visit in April 1994

The second study route followed Chiruwa-Hellok (1,570m), Sekathum (1,500m), Amjilhasa (2,500m), Gyphla-Pholey (3,000m), Ghunsa (3,340m), Khambachen (4,050m), Mirgin La (4,540m), Sele La-Yalung (4,050m), Ramje (4,376m), Tseram-Toranden (3,124m), Yamphudin (1,700m), and Fungfung-Mamankhe (1,823m). This report does not include the upper reaches of the Yangma *Khola* where wildlife abundance has been indicated but not studied.

Discussion

A question was raised by Mr. Devendra Rana, WWF-International, Switzerland, concerning whether any studies had been carried out on the medicinal plant trade as part of the medicinal

study, or if there was anyone else who had done it.

Mr. Devendra Amatya, WWF Nepal Programme, mentioned that a baseline survey of medicinal plants had been conducted, and it was found that the medicinal species were the most exploited species. The frequency, density, biomass, and the regrowth status of medicinal plants were also studied in that area.

The Chief Ecologist, Mr. Narayan Poudel, inquired if any intervention was needed from their side and if there were any recommendations.

Mr. Devendra Amatya, WWF Nepal Programme, pointed out that the area was very poorly managed since the local people themselves managed the area in their own style. Most of the diversity of the area would soon deteriorate if the area was not managed properly. Although the area was not densely populated, deforestation and mismanagement of the area were very serious. The area should be managed through community-based enterprise, local NGOs, or by the local people instead of by direct intervention of the government. The government should have a positive role and not discourage the local people to harvest resources. The people already knew that the resources were deteriorating and that they had to conserve resources through their own efforts. But, the efforts of the local people were not sufficient, therefore, INGOs, NGOs, and government offices must cooperate with them.

SOCIOECONOMIC ISSUES RELATED TO CONSERVATION OF THE KANCHANJUNGA⁴ MOUNTAIN ECOSYSTEM

EKLABYA SHARMA

Kanchanjunga is a unique mountain ecosystem falling into the three different national boundaries of India, Nepal, and the Tibetan Autonomous Region of the People's Republic of China. This mountain ecosystem encompasses subtropical to alpine zones housing a large number of flora and fauna, making it a 'hot-spot' of biodiversity. In this mountain ecosystem, we find great variations in elevation, climate, landscape, habitat, and vegetation types. It has rich ethno-cultural diversity and the socioeconomic attributes of the people living in and around this mountain ecosystem are location-specific, variable, and unique.

This mountain ecosystem has the conservation status of a national park in the Sikkim State of India. Nepal is already in the process of declaring it a conservation area. The portion of this

mountain ecosystem in the Tibetan Autonomous Region is also expected to receive some conservation status in the near future.

Socioeconomic issues in relation to the conservation of this mountain ecosystem could be common or specific in each of the member countries. It is in this context that this presentation focusses on issues related to the Kanchanjunga National Park in Sikkim; it is specifically a status report. This will also provide grounds for discussion in finalising the common issues of transboundary importance.

Kanchanjunga National Park in Sikkim

Kanchanjunga National Park comes under conservation management Category II with a biogeographical province of 2.38.12, covering the Himalayan highlands. It was notified

4 Known as Khangchendzonga in Sikkim



Plate 14: Bhotia women weaving in Sikkim

as a National Park on 26th August, 1977, with an area of about 850sq.km. The area was originally in the Reserve Forest status prior to its notification as a National Park, and the local people have no land tenurial rights, these rest with the State Government. In 1996, the area of this National Park in Sikkim was expanded to 1,784sq.km. out of consideration for the uniqueness of vegetation, habitat, and animal diversity. The expansion of the area includes settlements (ten households) at Bakhim and Tshoka within the conservation area. Many settlements, such as those at Yuksam, Sakyong, Chungthang, Menshithang, Lachen, and Monguthang, surrounding the park depend on the natural resources for subsistence. The major settlement is at Yuksam. The state and central governments are working to include more areas in this conservation area and designate it as a biosphere reserve. Most of the areas which have access to the settlements and eco-tourism trails are placed in the buffer zone. This is expected to provide the local communities with access rights to natural resources, so that they can generate income through eco-tourism related entrepreneurship. This national park is contiguous with the Taplejung area in Nepal. The expanse, flora, fauna, and

legal issues pertaining to the Kanchanjunga National Park are separately dealt with by Mr. Gut Lepcha, Field Director of the Park.

Socioeconomic Status

Communities living in Bakhim and Tshoka are Tibetans, and those in Monguthang are also of Tibetan origin. The other ethnic groups that live in the fringe areas are mainly *Lepcha(s)*, *Bhutia(s)*, Nepalese, and *Limbu(s)*. These five ethnic groups have different cultures and traditions. Kanchanjunga is regarded as the spiritual focus and revered as the protective deity of Sikkim.

The livelihood in the area is at a subsistence level, and there are three major options, namely, traditional farming, pastoralism, and tourism. Some people are also occasionally involved in the trade in wild plants and animal parts. The major occupation of the people in the lower and mid-hills is farming. The region has a strong agroforestry base with many traditional farming practices. Farming is on a subsistence level and basic resources, such as fuel, fodder, timber, litter for livestock-bedding, and litter for mulching, come from the adjoining forests. Other natural resources, such as medicinal herbs, wild edible plants and plants of ornamental and aesthetic value, and animals, are also brought from the forests by local communities according to their culture and traditions. The second important livelihood option is pastoralism, and this is mainly concentrated in the high altitude pasture lands. Livestock grazing pressure is felt in the lower and mid-hill forests. The high altitude pastures are primarily used for yak grazing. Yaks are reared for various products such as wool, meat, milk, and milk-derived items like *chhurpi*⁵. Sterile yaks, called

⁵ *Chhurpi* is a hard sweet made from yak milk

djo(s), are used as pack animals. Horses are also used for this purpose but in much smaller numbers. Sheep are reared for products like wool and meat.

In the Kanchanjunga National Park, tourism has been one of the major economic activities, especially in the Yuksam-Dzongri-Goechha La Trail, for the past two decades. About 1,500 trekkers visit this trail annually. These tourists need large numbers of support staff to organise the treks. This section of the national park adjoins the Nepal side. There are some trekkers' huts in the National Park and most of the tourists in larger groups along the Yuksam-Dzongri-Goechha La trekking corridor use tents. Mostly, local travel agents from Gangtok and from adjoining Darjeeling organise the trekking. Domestic tourists independently go trekking without the involvement of travel agents. However, all tourists use local porters or pack animals. The local communities involved in tourism-related activities are lodge operators, porters, cooks, nature guides, trekkers' hut managers, owners of pack animals, and those who provide indigenous food products and handicrafts.

Conservation Concerns

The local communities are using natural resources mostly from the forests in the conservation area. The population size is increasing and pressure on the natural resources is already visible in pockets. At Yusam, a hydroelectric project is being implemented on the Rathangchu River. About 1,000 labourers have migrated to the area, and this has further increased the pressure on natural resources. Management of these forests is of immediate concern with respect to their carrying capacity and biodiversity conservation.

The high altitude pastures are used for grazing yaks and sheep. In recent years grazing practices have been restricted

to certain locations, and this eventually caused increased pressure in these pastures. The carrying capacity assessment and biodiversity conservation of alpine pasture plants and animals are of great concern.

The Yuksam-Dzongri-Goechha La Trail is the most important eco-tourism destination in Sikkim. This trail is used mainly by three groups of people, namely, tourists, mountaineers, and the local community such as yak-sheep grazers. In tourism and mountaineering season, a dense volume of visitors, along with support staff and pack animals, crowds the area. The trekking corridor cleanliness, fuelwood extraction, and soil erosion, as a result of the movement of large numbers of animals and unregulated grazing by pack animals, are issues that need to be addressed. The landscape and biodiversity are the attractions for the visitors.

Several medicinal herbs and plants of aesthetic value are slowly disappearing. Steps to rehabilitate these plants *in situ* should be taken immediately. The individuals involved in generating income through such activities need to be engaged in alternative employment such as tourism.

The National Park forms the main catchment area for two important rivers, the Teesta and Rangit. The socioeconomic conditions of the people living downstream totally depend on the health of the National Park. Therefore, catchment management becomes the lifeline and an integral part of the development of the people of Sikkim.

Conservation Efforts

The Kanchanjunga National Park Authority, Wildlife Division, Forest Department, and Tourism Department are involved in the development and conservation-related management of this park.

Plate 15: *Salix sikkimensis* (East Himalayan willow)

Photo: Krishna K. Shrestha



A project on Sikkimese Biodiversity and Eco-tourism (a joint effort of The Mountain Institute, G.B. Pant Institute of Himalayan Environment and Development, The Travel Agents' Association of Sikkim, and The Green Circle) was introduced a year ago within this park along the Yuksam-Dzongri-Goechha La Trail. The project is a collaborative initiative designed to conserve the biological diversity of key destinations. At the heart of the project are participatory approaches that link enterprise operations with conservation action, while merging traditional cultural practices. Working with communities, the private sector, and the government, the project builds upon their skills, interests, and knowledge to: (a) increase community and private sector conservation; (b) increase economic returns from eco-tourism services and enterprises; and (c) contribute to policies that meet eco-tourism and conservation goals. The project has now been implementing a comprehensive project monitoring and research plan.

Recently the local community at Yuksam formed a Kanchanjunga Conservation Committee which has already taken up many conservation activities. This organisation seems to have long-term conservation interests.

Transboundary Issues

People living on all three sides of the international border depend upon sustainable coexistence with nature for their subsistence livelihoods. Populations and ecosystems in these areas face similar challenges and threats. The following issues could be baseline for introducing the development of a framework for a common transboundary programme.

- a) Migratory pastoralism across the border
- b) Tourism across the boundary
- c) Protected area management strategies across the border
- d) Conservation of natural and cultural heritage
- e) Habitat preservation for trans migratory birds
- f) Protection and rehabilitation from/ after transboundary natural calamities
- g) Experience sharing/capacity building.

There have been transboundary exchanges between Nepal and the Tibetan Autonomous Region of the People's Republic of China to conserve the Mt. Everest Ecosystem. The experiences of the exchanges between Tibet's Qomolangma Nature Preserve and Nepal's Sagarmatha could also be useful.

Discussion

Professor Pei of ICIMOD mentioned that he had been working on a paper called 'Policy Action Collaboration on Transboundary Conservation'. He further said that the common problems identified in the lower parts of the eastern Himalayas in Nepal, Myanmar, China, and India were the following.

- a) Land tenure and resource rights of local people
- b) Deforestation and shifting agriculture
- c) Ethnic conflicts

- d) Transboundary issues - illegal cutting, illegal harvesting, illegal trading, and smuggling (socioeconomic problems)
- e) Poor communications and a low level of information, misunderstandings

The transboundary issues of the high Himalayas were quite different from those of the eastern Himalayas.

It was further discussed that development projects were among the most important things affecting socioeconomics. Conservation and cultural conservation were often mentioned but development projects set everything out of context, and one project could do a lot of different kinds of development. Dr. E. Sharma from Sikkim was questioned about how these things were happening in the Lithongchi Project and how it affected the community.

Dr. Sharma mentioned that there was a 30 MW Hydel Project coming up in Yuksam, which had led to 1,000 labourers settling in Yuksam, and this had put a lot of pressure on the area in terms of natural resources. Therefore, there was pressure in the Kanchanjunga National Park which needed to be handled. One thing was very important in transboundary issues. Many people from Nepal came to Sikkim, e.g., many Nepalese people were working on the Hydel Project. People from Nepal also came and worked as porters in the tourist area of the Yuksam Region. These issues needed to be tackled. It was a very complicated issue when migration of people had taken place. The whole lifestyle changed after migration. For example, there was no local 'Haat System' (open market) in Yuksam. After the arrival of 1,000 people who did not own land or cultivated areas but only had cash, people started raising plenty of vegetables in the area and, at

present, there was a weekly (*Haat*) market. So the lifestyle of the area had completely changed within six to seven months. This was just one example. There was other damage, through blasting and water diversion, which was an ecological issue. Apart from that, the migratory population was imposing a lot of pressure on the respective areas. This was the main concern they were facing, and they had formed a committee. They were also working with the community.

Mr. Mingma N. Sherpa, WWF Nepal Programme, mentioned that Dr. Sharma had come up with interesting transboundary issues and that this issue needed separate time for discussion. Many lessons were learned about transboundary issues through migratory problems, ethnicity, area management, strategies in conservation, protection, and rehabilitation. Fortunately or unfortunately, many NGOs had been established in Nepal recently. There was a committee on the Kanchanjunga side which was known as the 'Kanchanjunga Conservation Development Committee'. One of the positive aspects of lessons learned in Nepal was that the conservation area or the protected area had been managed efficiently by NGOs with the government in the background, e.g., the Annapurna

Plate 16: *Rhododendron fulgens*



Photo: Krishna K. Shrestha

Conservation Area. On the Sikkim side, it seemed that there was quite a mix of management. There was pure government management of the park, and then they had NGOs, conservation committees, institutes, and other groups working in that area. Was that the kind of policy or approach that China and Nepal should be adopting, with the government playing the jurisdictional role and most of the development approaches being handed down to the community level for the local NGOs and the conservation committees to actually implement?

Dr. E. Sharma pointed out that Sikkim was a unique example. The land tenure was entirely held by the government in the Kanchanjunga National Park. The Yaksum to Dzongri Trail was the only trail that was internationally famous- so most people went there. Until that time, the benefits were taken by travel agents from outside who catered to tourists. The local community was not getting any benefit, so their feelings were that tourists came and went, but they did not receive any benefits from saving the biodiversity. When work started there, they had found that the people were keen on conservation, provided they were given incentives in terms of skill development. For example, there was a training course for porters in which 200 porters were getting trained. There were only 70 locals and more than 100 were from Nepal, all operating on the Sikkim side. There were some problems but they somehow worked with the group and found a solution. There was a naturalist guide training course conducted and, in the beginning, only one or two local people participated, but in the second session six to seven people joined in. This was one of the immediate examples in which people realised that they had to work themselves if they wanted outsiders to help them. So they formed a

strong committee amongst themselves which was registered as the 'Kanchanjunga Conservation Committee'. Currently there were several tourism-related issues which they wanted to handle themselves. As far as conservation was concerned in the area, the Forest Department and Wildlife Department had excellent management systems inside, but, along the trail, due to the support people for tourists and pack animals, there were a lot of problems. The local community had realised this and they were getting involved. If this level of degradation went on along the trail, the tourists would stop coming. The government could not handle each and everything so the community had to be active. Mr. Sharma gave the following example. After the porters' training, six tourists went to Dzongri and wanted to gather rhododendrons, which had taken about 20 years to reach one foot in height, and fuelwood to keep warm at night. The porters did not agree, no matter what amount they were offered, because they realised that people came to look at the flowers. The tourist group went to Calcutta and wrote to the President, the Prime Minister of India, and the Chief Minister of Sikkim about what had happened. There was a newspaper column which mentioned that real eco-tourism in which the community was involved could be seen in Sikkim. Tourism was just starting in Sikkim so this was the right time for the project. The Government of Sikkim is making a master plan, and the Tourism Department is actively supported by the WWF, G.B. Pant Institute, and various other sectors to come up with a master plan which will really safeguard the protected area.

Mr. Javed Hussain of WWF, Thailand, commented that 100 tourists might directly or indirectly have had more resource impact than 1,000 porters or

construction workers. On the one hand, they were saying that tourism itself was a development activity and, on the other hand, they were saying that tourism might be the root of the problem. Mr. Hussain suggested that, since different countries had different legal systems, they should come up with at least a common functional definition at the workshop. If they could come up with a legislative legal definition then they might run into problems in different countries. With a functional definition there would be a larger area and it would increase the capacity to functionalise boundaries. Therefore, they should push towards a functional definition. They should start thinking of conservation as development. A concrete example of this was Costa Rica. One of the main development activities that had taken place in Costa Rica had been the use of local people to document and monitor an inventory of biological resources. You could not have 30,000 PhDs hanging around the Kanchanjunga National Park. Employment generation should be local and it should not be externally driven because tourism, eco-tourism, was externally driven. Tourism should be internally driven, since they did not really know how much diversity there was in the area. There should be documentation of diversity, documentation of indigenous systems, documentation of indigenous medicinal uses, and capacity building. The presentation by the Chinese guest from the TAR had been excellent. In that area there was a golden opportunity to combine development, education, resource inventory, biodiversity inventory, and the use of conservation as development. Mr. Hussain thought they should go beyond conservation and development and think of a functional definition which would make it easier to work without hassles at different legislative levels.

Photo: Krishna K. Shrestha

Dr. Bijaya Kattel of the Department of National Parks and Wildlife Conservation (DNPWC) mentioned that, if there was no legal base in the Programme, it was very hard to think of its sustainability and said that the idea of a functional definition was very important. The legislation should incorporate this for the same or at least similar functions as well as activities and long-term impacts in such a way that all three countries would be managing the area with similar transactions and for the same goal.

Mr. Brian Penniston of the Mountain Institute commented on Dr. Sharma's presentation by stating that since there were 100,000 domestic tourists visiting the National Park, and since it was an issue which was very intriguing and interesting and presented a management challenge that had not really been discussed in detail. Yet, when compared to a fairly limited number of foreign trekkers, even with a lot of support staff of four to one porter, you would still have a major environmental impact and possible economical impacts from those 100,000 domestic visitors. As Nepal progressed, domestic tourism, whether from the Indian subcontinent or elsewhere, was going to be more and more of an issue as well. If you started to look carefully at tourism numbers, you would notice more visitors from India, and this con-

Plate 17: Discussion with local inhabitants about conserving the Kanchanjunga area: Pholay (3,200m)



stituted both environmental and economic opportunities as well as constraints.

In reply to this comment, Dr. Sharma mentioned that in 1980 there were only about 20,000 tourists visiting Sikkim, and it had now gone up to more than 100,000 tourists. Ninety per cent of the tourists were domestic tourists and that was the force that had to be reckoned with in the long run, otherwise, tourism was really going to be detrimental in terms of protected ar-

eas as far as management was concerned.

Dr. R.K. Rai from India also suggested that a carrying capacity assessment study should be carried out before making arrangements for increasing tourists.

Dr. Sharma highlighted the problem of avoiding the negative impacts from tourism flow with one destination only. He further added that many new destinations had already been opened up in Sikkim.

Day Two

Technical Session Three

Chairperson

Mr. Devendra Amatya

THE MENRIS TAPLEJUNG DATABASE

PK. MOOL

In 1990, the International Centre for Integrated Mountain Development (ICIMOD) established the Mountain Environment and Natural Resources' Information Service (MENRIS) as a resource centre for the HKH (Hindu Kush-Himalayas) region for the study and application of GIS (Geographic Information Systems) technology. The objectives of MENRIS are given below.

To improve environmental and natural resource management and promote sustainable economic growth in mountainous countries, by facilitating solutions to common problems and ensuring the communication of results on a compatible GIS platform.

To assist in the promotion of information exchange between interested participating countries of the HKH Region, using GIS technology, and to act as a clearing house for existing knowledge in mountain resource management for agencies involved in mountain development.

MENRIS principally emphasises (i) the establishment of in-house GIS and Re-

mote-sensing (RS) facilities; (ii) training and capacity building for the application of GIS/RS to natural resources' management in each of the regional member countries, including the establishment of national GIS facilities; (iii) establishment of a digital HKH database; (iv) networking in member countries within the Region and sub-region; and (v) computer application and development.

MENRIS is a catalyst in an effort to construct GIS databases with national collaborating institutions. More often, data are dispersed among the institutions, and the conservative approach to information sharing in the Region presents further challenges to the development of a GIS database. Defining common standards for a database on sub-national/national and regional scales has been the first step towards collection and dissemination.

MENRIS has carried out the compilation of a national-level database containing socioeconomic and natural resources' data for Nepal on a scale of 1:250,000 in Arc/Info software. Some

Area,	3,646sq. km.
Population,	(1991) 120,053
Male Population,	58,774
Female Population,	61,279
Population Density,	32.93 person per sq. km
Number of Households,	21,370
Average Household Size,	5.62
Population in 1981,	120,780
Per Cent Population Change,	0.601 per cent (negative)
Total Economically Active Population,	52,748 (43.94%)
Males, 27,440	(22.86%)
Females, 25,308	(21.08%)
Ratio of Dependent Population (<15 - >60) and Non-Dependent Population (15 -59), 0.57	
Average Population Per Health Post,	13,341
Land Use	
Grasslands	30,451ha
Forests	99,623ha
Shrubs	39,544ha
Other	153,305ha
Agriculture	
Irrigated Area,	7,119ha
Total Cultivated Area,	27,533ha
Avg. No of Cows/ Buffaloes Per Household,	4.94
Avg. No. of Small Animals (Sheep/Goat) Per Household,	3.14
Avg. No. of Poultry Per Household,	4.99
Education	
Percentage of Total Literate Population	45.95
Males,	30.29
Females,	15.67

information on the Taplejung district from the Nepal database is given in the chart above.

Besides this, information on physiography, climate, ecological regions, remote sensing data, etc is available on the database.

Presentation of Maps

Mr. Mool presented maps on the various indicators for Taplejung.

Discussion

Answering the questions raised about the potential dangers to lakes in China, India, and Nepal, Mr. Mool said that looking at the satellite images there

were comparatively less dangerous lakes on the Sikkim side, but there was no field data information. In Bhutan, there was a flood three years previously and similar occurrences of such phenomena in Kanchanjunga were very high. He also mentioned that the digital information available at MENRIS was open to the public also.

Mr. Javed Hussain, WWW Representative, Thailand, enquired what Mr. Mool would have done if he had to monitor the proposed Kanchanjunga trans-boundary area. What would be the frequency needed to monitor it on a regional scale and what would be the financial resources required to do that

job? He further asked how effective GIS and remote-sensing technologies were for developing, monitoring, and managing such an area?

Mr. Mool said that first it was necessary to develop a database of the whole Kanchanjunga area. Following which, topographical information, such as the contour lines, was required. This was just the basic information that was needed. Since all the detailed topographical maps were not available at the moment because of government policies in the three countries, a digital terrain model using stereo satellite images could be made. Indian, French, Japanese, and American satellites were capable of doing this, but it would be expensive. One frame of stereo capability satellite image covering approximately 60-80sq.km. would cost about US\$ 4,000. Indian satellite rates were subsidised for their own institutes and the charges were only Rs⁶ 4,000. But, for institutions like ICIMOD, the rates were very high. Mr. Mool added that, at the moment, the most commercial and easily available satellites were French and American satellites. So topographical mapping, vegetation monitoring, and even habitat mapping could be carried out. But, apart from some places in China, there was no habitat mapping for wildlife and forest species or for monitoring the vegetation cover.

Mr. Bijaya Kattel, Department of National Parks and Wildlife Conservation, asked what the intervals should be for vegetation monitoring.

Mr. Mool replied that botanists and vegetation people should be consulted

about the optimum season to map the different types of species. Actually monsoon or just before monsoon might be a good time.

Mr. Devendra Amatya, WWF, Nepal Programme questioned Mr. Mool about how long he had been monitoring lake outbursts and the way he collected remote-sensing data.

Mr. Mool replied that he had been monitoring glacial lakes since 1985 and since all the glacial lakes are in the restricted zone of Nepal, it was only possible to monitor them through satellite imaging. Even with 80km resolution, the small-sized lakes could be recognised. So an inventory map was made and some funds collected to arrange a fly over. Because of the restrictions, the aerial image of the high mountains could not be acquired. The best way was to hire a Pilatus Porter aircraft and to use a motorised ordinary camera to take photographs. That was how it was done. The next step after that was to go to the field, which was a very expensive exercise.

Mr. Devendra Rana of WWF-I, Switzerland wanted to know which institution Mr. Mool would collaborate with in the TAR (Tibetan Autonomous Region) of China for GIS information, as for example, the G.B. Pant Institute in Sikkim area.

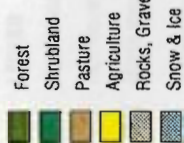
Mr. Mool replied that there was a collaboration programme with Beijing on an official basis. He further added that even right now their experts were in Lhasa with GIS equipment and were conducting training on installation of the equipment.

⁶ There are 35.50 Indian rupees to the U.S. dollar

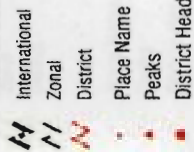
TAPLEJUNG DISTRICT

Land Utilisation, 1978/1979

LEGEND



BOUNDARIES

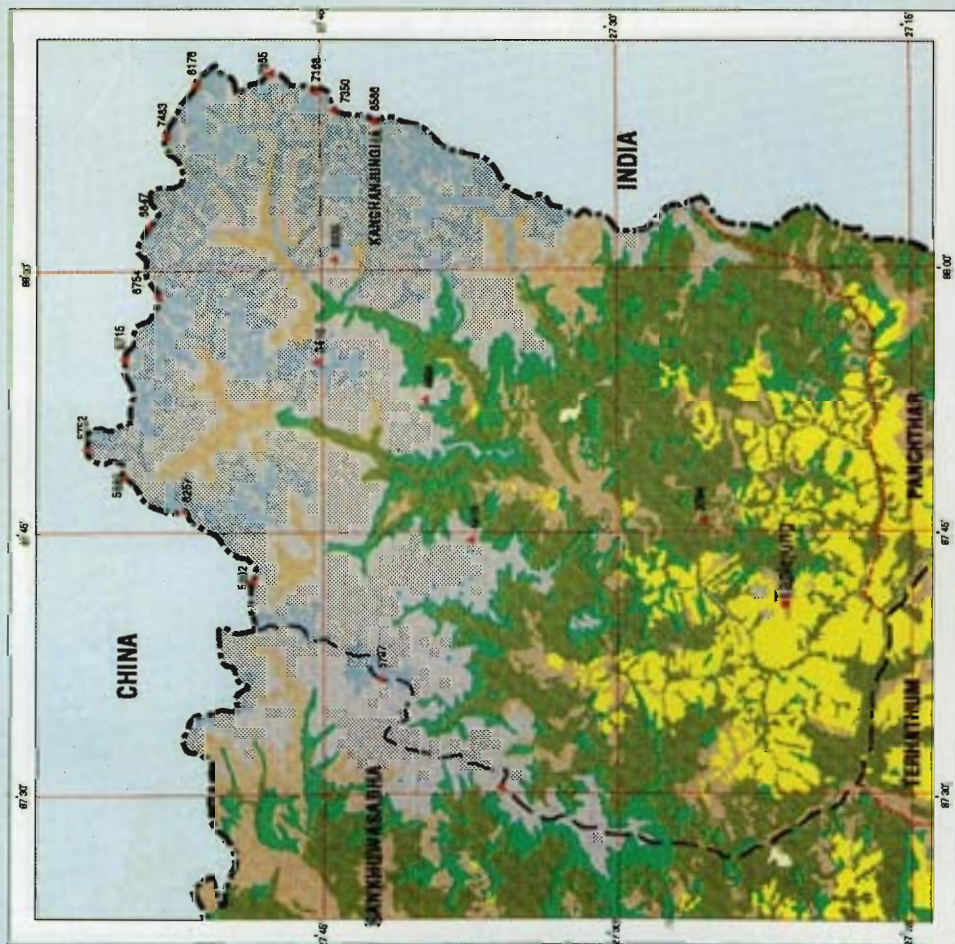


20 km

SCALE



Source: LRMP Map Scale 1:50,000
HMG/N and The World Bank 1990.



VDC (Settlements) by Physiographic Region

High Himalaya (2,500-8,848m)
High Mountains (2,000-2,500m)
Middle Mountains (700-2,000m)

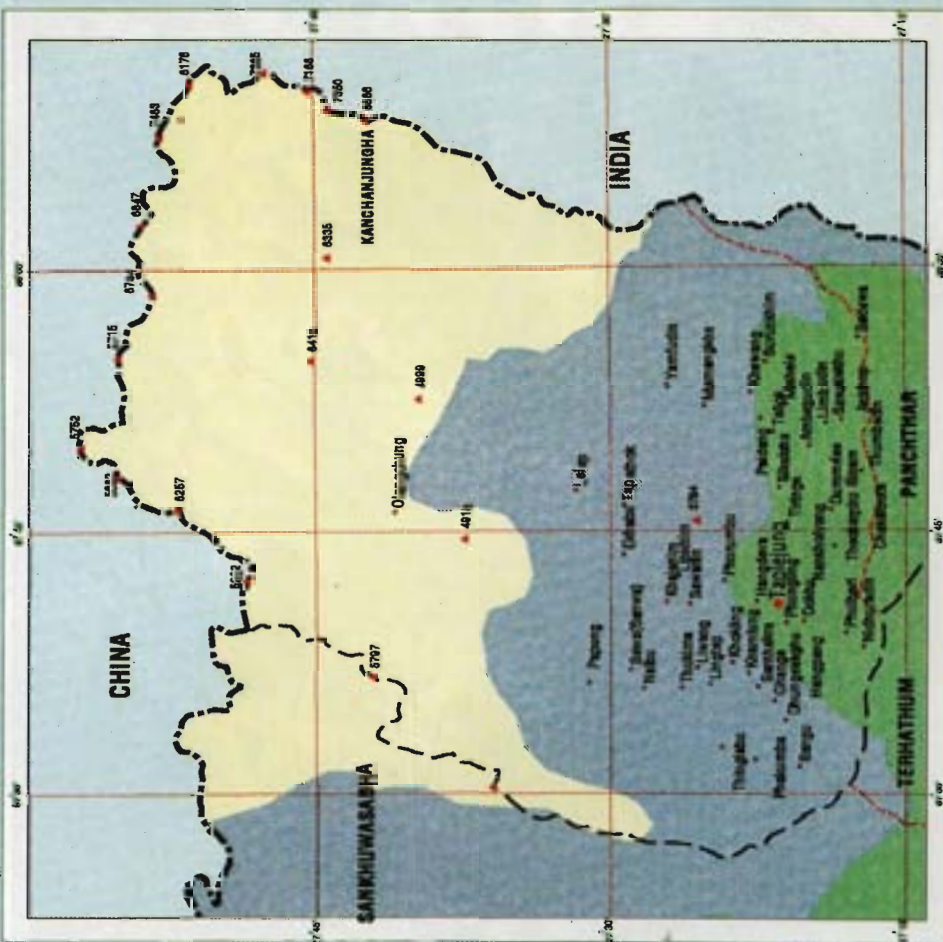
	International	Zonal	District
1-4			
1-1			
2-2			
3-3			
4-4			
5-5			
6-6			
7-7			
8-8			
9-9			
10-10			
11-11			
12-12			
13-13			
14-14			
15-15			
16-16			
17-17			
18-18			
19-19			
20-20			
21-21			
22-22			
23-23			
24-24			
25-25			
26-26			
27-27			
28-28			
29-29			
30-30			
31-31			
32-32			
33-33			
34-34			
35-35			
36-36			
37-37			
38-38			
39-39			
40-40			
41-41			
42-42			
43-43			
44-44			
45-45			
46-46			
47-47			
48-48			
49-49			
50-50			
51-51			
52-52			
53-53			
54-54			
55-55			
56-56			
57-57			
58-58			
59-59			
60-60			
61-61			
62-62			
63-63			
64-64			
65-65			
66-66			
67-67			
68-68			
69-69			
70-70			
71-71			
72-72			
73-73			
74-74			
75-75			
76-76			
77-77			
78-78			
79-79			
80-80			
81-81			
82-82			
83-83			
84-84			
85-85			
86-86			
87-87			
88-88			
89-89			
90-90			
91-91			
92-92			
93-93			
94-94			
95-95			
96-96			
97-97			
98-98			
99-99			
100-100			

Place Name	Peaks	District Headquarters

0 20 km
SCALE



Source: Topographical Zonal Map Scale 1:250,000
Department of Survey, HMG/N 1988.



KANCHANJANGHA



USGS/DAAC, April 1985, USGS/DAAC, Apr. 1985
 Image CD 4 (4-10-85) 1
 Page 4 of 4 (4-10-85)



TRANSBOUNDARY WILDLIFE TRADE ISSUES

Ms. FAHMEEDA HANFEE

I am not here to make a formal presentation but to express my views and to learn from the experiences you all have on this subject. I work for TRAF-FIC-India, the trade monitoring division of WWF. To begin with, I would like to bring to your attention some trade realities from both the global and the Indian scenario.

The global trade in wildlife is estimated to be worth US\$ 20 million annually. According to Interpol statistics, this is second only to the narcotics' trade. The global trade includes at least 40,000 primates, of which the USA is the main consumer. Hunting, poaching, and the wildlife trade are banned in India. Still tigers, other cat species, elephants, rhinos, musk deer, bears, and many other animals are being poached for various uses. Commercial activities with these poached animals are trade, pets, wildlife derivatives, souvenirs, medicine, and timber. On the other hand, we have laws and treaties. These are the Wildlife Protection Act, the Export and Import Control, the Cus-

toms Act, and so on. These laws and treaties are enforced by certain agencies involved with the Directorate of Wildlife Conservation which comes under the Ministry of Environment. These are the State Forest and Wildlife Department, Indian Customs, Indian Police, Paramilitary Forces (Coast Guards, Border Security Forces), and intelligence services such as the CBI (Central Bureau of Investigation) and Revenue Intelligence.

Before I speak about the wildlife trade, I would like to say a few words about TRAFFIC. TRAFFIC - India was established in January 1982 as a division of WWF, India, and part of it works for the largest wildlife trade monitoring programme in traffic network. Its mission is to improve, in accordance with the principles of World Conservation Strategies, the conservation of biological diversity in India, monitoring trade and other forms of mutilation of animals and plants and the derivatives that are contributing to biodiversity composition. Our aim is to identify ar-

eas of use which may be detrimental to any species and to facilitate the control in trade of such species. Our main objectives are investigations; monitoring; reporting wildlife trade activities, especially those which are illegal; to be a source of accurate and objective information; to provide a technical basis for the establishment of policies and programmes of wildlife trade; education; training programmes for agencies and teachers' training; and maintaining a wildlife-related database. These are some of our major involvements.

Not only TRAFFIC, but also conservationists all over the world, consider illegal poaching and trade in wildlife to be a major concern. Unless we are able to protect the biodiversity which exists in our protected areas and national parks, the whole concept of a protected area is not achieved. There must be an emphasis on anti-poaching and an awareness drive among the local people for an effective management pattern for protected areas. Many times, effective implementation of anti-poaching activities and conservation activities becomes difficult when transboundary issues emerge. The forest policies of adjoining countries may differ from one another, and it is the same with law and order. Yesterday we had a very good example of the Blue Sheep (*Pseudois nayaur*). Licences were issued for hunting in Nepal, whereas in India we cannot even think about it. Blue Sheep are a very good indicator species for snow leopard (*Panthera uncia*) existence, as it is a major prey species for the animal. Many times, involvement of foreign nationals makes it difficult for a country to take action against them, and this makes the border areas more sensitive to illegal wildlife trade activities, e.g., the Royal Manas National Park of Bhutan has a village inside. The economy of this village depends largely

on orange orchards. These oranges are transported for sale through the Indian Manas. The newly constructed road is used for transportation purposes. The road goes from the Indian Manas to Panbang village in the Royal Manas-Bhutan. This has already raised concerns among conservation.

I would like to bring to your attention that there was a Rhino (*Rhinoceros unicornis*) horn seizure two weeks ago in Thimphu. The person who was caught revealed, during interrogation, that the rhino horn was obtained from India. This will help all of us to focus on the possibility of poaching and transportation in the Manas area.

Besides wildlife trade, which is my main focus, there are other issues that need to be addressed, e.g., grazing, eco-tourism, siltation, and encroachment. The Director of the KNP (Kanchanjunga National Park-India) mentioned that there was a possibility of shepherds being involved in the wildlife trade. In our musk trade study we found this to be so in the case of the U.P. (Uttar Pradesh) Himalayas.

Overgrazing, construction, and similar activities on one side of the border result in a loss of forests on the other side. This problem is prevalent in Valmiki and Dudhwa Tiger (*Panthera tigris tigris*) Reserves where a whole belt of dying Sal (*Shorea robusta*) trees was observed. Some cases of encroachment along the Dudhwa-Nepal strip have been noticed but, thanks to the Nepalese authorities, some of these have been removed recently. In Valmiki also, it has been reported that about 5,400 acres of forest land have been encroached upon because the boundary is not well defined. This shows how porous our borders are. Another example is, if we take a close look at the government data about wildlife seizures in the recent past, that between

1994-1996 there were approximately 20 seizures of various items, mostly tiger and leopard skins and bones and ivory, in and around Dudhwa (Indo-Nepal border) and one in Silguri.

If the management of National Parks which share a common boundary could be carried out jointly by the countries involved, many issues would be solved. Unless a cooperative approach is adopted by the concerned officials of the respective countries, this trade will continue to flourish. As trade routes involve different countries, information sharing among the countries would have to be facilitated. Now the decision about how we can have a more effective management plan is up to us.

Slide Show on Traded Animals

Although there are many species involved in trade, my focus, keeping in mind the transboundary areas, is on the more endangered animals.

Rhinoceros: Rhino is poached for its horn. The horn mainly goes to Yemen and Oman where it is used for making carved handles for traditional daggers. For this purpose, the African rhino is used. The Asian rhino, which is the one-horned rhinoceros, is mainly used in traditional medicines in China, Taiwan, South Korea, and Tibet. The Asian rhino horn or 'fire horn' costs five-10 times more than African rhino horn or 'water horn' in Taiwan and China.

Tiger: Each and every part of a tiger is used for some purpose or the other by human beings. Skins and heads are used as trophies, claws as talismans, bones and skulls for medicine, fat for balms and potions, and so on. I would like to mention that, in 1993 alone, 475kg of bones and 13 tiger skins were seized, and it was estimated that 47 tigers must have been killed to account for these alone.



Plate 18: Musk Deer

Photo: J. Van Gruisen

Musk and Bear Bile: Musk deer (*Moschus chrysogaster*), Himalayan Black Bear (*Selenarctos thibetanus*), and Brown Bear (*Ursus arctos isabellinus*) are highly endangered animals within India, and their distribution is limited to the Himalayas. The musk deer is poached throughout its belt and is one of the most sought after animals because of its valuable musk pods which are used as a perfume base and in medicines.

Fur Items: This also forms a major ingredient of this trade. The wild cat fur trade in India deals with at least 20 species. To name a few: snow leopard (*Panthera uncia*), lynx cat (*Felix lynx isabellina*), fox (*Vulpes spp*), and otter (*Lutra spp*). TRAFFIC-India did three surveys in Kathmandu to quantify the fur trade in Kathmandu as it was a major trade centre for fur items, and these were displayed openly in shops. Thanks to the Nepalese authorities, now there are no more displays in the Kathmandu market of these items.

Reptile Skins: It is estimated that India used to export US \$60 million worth of reptile skins annually when the trade was legal. Today, there is no overt trade, but illegal trade continues; it has gone underground. Reptile

skins are used for manufacturing wallets, belts, shoes, and other accessories of skins from snakes, monitor lizards, and also crocodiles. Even turtles are poached heavily for their flesh and for curios.

In addition to animals, plants are also traded from India, especially medicinal plants. India and Brazil are the largest exporters of medicinal plants. India has approximately 2,500 species of medicinal plants, and out of these 2,000 are used in traditional medicines, while at least 150 species are used commercially on a fairly large scale. The notion that a plant collected from the wild is more efficacious than a cultivated one poses problems for plant conservation. An export ban exists on all plants obtained from the wild, except the ones with no objection certificates, and these too can be issued only from Mumbai, Delhi, Calcutta, Chennai, and Cochin. Apart from this, 46 species of plants are totally banned for export.

Besides medicinal plants, orchids are also traded for ornamental value. The orchid trade centres in India are Kalimpong, Shillong, and Trivandrum. Often wild orchids are smuggled out of the country with cut flowers by misdeclaring them as lilies or other exotic flowers.

Discussion

Dr. Kattel gave the participants some information about the Transboundary Joint Meeting between Nepal and India especially dealing with these issues in January 1997. There was a bird city in Patna which was visited by some journalists from Kathmandu, and they brought some of the trade in birds to light.

Ms. Fahmeeda Hanfee, TRAFFIC-India, informed the participants that there was a study of live birds being carried out, covering this area, and forest of-

ficials had been informed about the trade. One place in Patna was not only famous for live birds but also for live animals. The report would be out in a month or two, and the recommendations would be implemented. Forest officials would then be pursued to get them to take action.

Mr. Brian Penniston of the Mountain Institute wanted to know who were buying the orchids and where the ultimate market was. Was it a domestic or an international market and were they buying these as cut flowers or plants?

Ms. Hanfee replied that the orchid trade had both markets, domestic and international. They were basically traded for ornamental value. They were traded both as flowers and plants, but there was a lot of fraudulence in this trade.

Mr. Javed Hussain, WWF-Thailand, asked the Chinese delegates whether the demand for animal products was increasing or decreasing in China since many of the animal (tiger) products were consumed in China. Was there any government policy to ban these products? What was the current position of China?

The Representative from China, Mr. Ban Zong, replied that this was a part of culture in China and it could not be stopped immediately. Due to the endangered wildlife species, the government, including the Tibetan Government, had made regulations to restrict some use of wildlife. Some were absolutely prohibited such as the rhino horn. Officially it was not permitted, but illegally it was another matter. Musk deer products and bear bile were permitted legally. There was a deer breeding farm in Tibet designed to breed domestic deer to supply to the market. There were bear breeding farms in northeastern China and southwestern China.

Prof. Pei further added that there should be a good balance between conservation of nature and conservation of culture, and this takes time. In China, about 5,000 medicinal plants were being used, out of which 1,000 were regular and 500 were used on a large commercial scale. Five years previously, the annual export of medicinal plant products was worth US\$ 1.6 billion. Regarding animal products, 400 different animal species were used in medicine, out of which 50 were for regular use. According to scientific research and statistics, there were no species used in Chinese medicine that were already extinct. The best conservation strategy for plants and animals was to use them. When the demand was there, people automatically would find a way to develop or multiply them. This was just general information. Illegal trading and black marketing should not be considered a good thing. Substitute materials had been produced in China for many years, but this had not been successful. The only one which had been successful was buffalo horn as a substitute for rhino horn.

It was also added that an effective and practical management system must be developed so that poor people did not get poorer and the rich did not get richer.

Remarks from Sikkim

MR. P.K. BASNET

It is my privilege to present my remarks on the ecology efforts to this Regional Workshop on the Conservation of the Kanchanjunga Mountain Ecosystem. Kanchanjunga Mountain Ecosystem is a unique system. This system has an area covering three different political boundaries, namely, those of India, Nepal, and Tibet

(China). On the Indian side, Kanchanjunga falls in the State of Sikkim and is designated as the Kanchanjunga National Park. The special feature of this park is that it has a large number of flora and fauna which makes it extremely rich in biodiversity. My friends from Sikkim have already described the Kanchanjunga National Park in greater detail with regards to area, irrigation, vegetation, habitat, flora, and fauna and also on socio-economic activities of the people living in and around KNP. The State Government of Sikkim and the Central Government are working on raising KNP's status to a Biosphere Reserve. In Sikkim, the best efforts are being made to conserve this unique mountain ecosystem. The system, although separated by political boundaries, is one whole system, and conservation and management issues should be dealt with through common complementary action. The trans-boundary issues of high altitude grazing, wildlife movement, tourists, conservation of plants, and so on have to be looked into professionally. Measures for implementation should be adopted after common study in a site-specific manner. In order to do this, there should be site visits and study tours by experts involved in research management in Kanchanjunga in each country. This should be followed by a workshop in which specific transboundary issues common to this country are identified. Following this, a comprehensive research and management programme should be developed. I am extremely pleased that we have come to one table to discuss transboundary issues of the Kanchanjunga Mountain Ecosystem. The efforts made by ICIMOD are highly praiseworthy. We had a good beginning and I strongly believe that we will be able to conserve this unique mountain ecosystem for years to come. Let us dedicate ourselves to conservation in this area. Thankyou very much.

Discussion

Replying to the question about how many people/population there would be inside the proposed biosphere reserve area, Mr. Sharma replied that, currently, the Kanchanjunga National Park had 1,760sq.km. and 10 families living inside the area. There was very sparse settlement along the fringe area. Now another wildlife sanctuary had also been included which had no population. With this addition, they were making a compact single biosphere reserve. For the settlement on the fringe areas, they were making a buffer zone. The actual physical identification was being carried out currently by the Department of Forests.

Mr. Brian Penniston of the Mountain Institute wanted to know about the advantages of declaring a biosphere reserve. The strategic thinking behind this was not very clear, e.g., there were no specific funding sources to provide money only for the biosphere reserve. If the advantages were to increase local participation in the system of the Government of India, were there any other ways to do so without declaring it a biosphere reserve?

Mr. Sharma replied that in National Parks there was no designated buffer zone, but in the biosphere reserve there was a core zone and a buffer zone. The core zone was an area totally protected from any outer interference. On the fringe areas of National Parks, people had been in some ways, traditionally, drawing resources from the core zone. So the idea of various activities which were implemented in the buffer zone was to keep them away from the core zone. He also added that funds were provided to the buffer zone for protection and regeneration of the degraded area as well as for the total protection of the core zone.

Mr. Narayan Poudel, Chief Ecologist from the Department of National Parks

and Wildlife Conservation (DNPWC), requested the Indian participants to share their experiences of Joint Forest Management, and how much of it was applicable to buffer zone management, with the participants. He also asked if community development activities and income-generating activities really motivated the local people to contribute towards conservation and whether the protected area system really increased the biodiversity of the area?

Mr. Sharma replied that Joint Forest Management had been introduced by the government in some areas, and it had been very successful in the plains of West Bengal but had not been successful in the hilly regions. Regarding conservation, if provided with economic incentives and close cooperation with the community and, with the proposal coming from the community, itself, then it could really work well. He also added that, since people from different areas had different demands and needs, and their requirements were dependent on the resources, conservation could not be generalised and needed to be site-specific.

Mr. Mingma Sherpa of the WWF-Nepal Programme, commented that the enlightening thing about the biosphere reserve was the total aspect of the inclusion of people, core areas, buffer zones, and of living action research. The idea of how to actually involve people was very interesting and this might be an interesting concept for the future which both the China and Nepal side could also propose. There was no specific legal action in setting up a biosphere reserve. It also drew the attention of the international community. Transboundary parks between the United States and Canada had also been set up as biosphere reserves; this could also be done here on the level of regional cooperation. There could be cooperation on research, tourism, training, management, technology

transfer, and sharing of information on data. So, it was worth pursuing.

Remarks from India

DR. R.K. RAI

I would like to mention that the Government of India is in the process of designating this area a biosphere reserve. Old institutions such as the Zoological Survey of India and the Botanical Survey of India, which have been working for 70-80 years, and the G.B. Pant Institute of Himalayan Environment and Development, which has been working for seven to eight years, are giving support to the process. The area harbours unique biodiversity. These institutions are already assessing the biodiversity status and conservation needs of the area. Once we designate the area a biosphere reserve, it will have a better conservation status. Presently, the proposal put by the Sikkimese Government mentions that there is one existing National Park and Maenam Wildlife Sanctuary. These areas will be a part of the core zone. The total area of the biosphere reserve is going to be 2,665sq.km.

Once we designate the area as a biosphere reserve, the Government of India expects a management action plan from the State Government for implementation, and 100 per cent funding will be given by the Government for carrying out approved activities. I am told by the representative of the Sikkimese Government that they will be submitting the reports very soon. Once the management action plans are finalised and approved by the Government of India, funds will be provided for research, training, education, protection, and many eco-development activities in the region. The basic philosophy of the biosphere reserve programme from our side is that all the

human activities in the core zone are to be more or less banned. These areas are supposed to be preserved in their totally natural form. Activities encouraged in the buffer zone are intended to keep people away from the sources in the core area, because people who are living there ultimately depend upon local resources. Once people have alternative sources of livelihood, then the dependancy on forest products will decrease. Basically floriculture, horticulture, and beekeeping can be encouraged. Our major focus is on people's participation. In which way can we convince the people to participate in conservation activities? For this purpose, whatever activities are initiated, some economic benefits must accrue to the people, only then will the locals be attracted towards the programme. Unless local people become involved, all the efforts of the government will fail. Nothing will materialise at the field level. For this purpose, the people need to be educated, and they should be provided with alternative sources of livelihood. These are the two focussed programmes which are implemented in all the biosphere reserves. Till now, we have been largely involving the Forest Department since the areas are basically managed by the Forest Department. In the buffer zone, there are some areas which are outside the control of the Forest Department, therefore, we are also considering the involvement of other departments like agriculture, fisheries, and so on. There is a lot of scope for exploiting resources for the benefit of the people without having any damaging effects.

There are major problems in the hills such as infrastructure, communications, roads, and so on. These problems are such that, if you develop infrastructure, they have their own repercussions and if you do not develop infrastructure, again there are reper-

cussions. Our national policies on any major development activities of major natural resources, hydroelectric, and other projects used to be decided only by a group of officials from the Central Government, State Government, and some experts. Now the Government has decided to have a public hearing in which the officials will go to the field and discuss these matters with the local people. A lot of information about various problems and solutions comes from the local people. Such areas have great potential for horticulture and floriculture. These projects are such that they do not have any impact on overall conservation efforts.

In the central Himalayas, there is a problem of absentee farmers. Wherever there is free labour available, only then do people practice agriculture. Wherever money has to be spent, it is not considered to be a beneficial activity. We will be designating this area as a biosphere reserve very soon. As our friends from Sikkim already mentioned, it will cover a large area of Sikkim — almost more than 25 per cent. In fact, in buffer zones, the restrictions are not too many. Traditional activities will continue with little modification. There are some activities which are detrimental to conservation efforts. People will be educated to change their way of doing things. Once we come out with the final recommendations, we have to be very practical. We should come up with recommendations which can be accepted by both the government as well as the people.

Thankyou.

Remarks from Nepal

DR. BIJAYA KATTEL

A biosphere reserve has three major components, namely, protected areas,

people's participation, and regular monitoring. So, once this Kanchanjunga area is established as a whole in three different countries, probably then we can call it one biosphere reserve. That is collective work. Today, we have already heard of a biosphere reserve and national park, and now we come to a conservation area. Why it has been proposed as a conservation area is that the experience of Nepal has so far been an experience in which people's participation is maximised. I will describe briefly the status of this area on the Nepal side. This area has already been proposed as a conservation area and any day it can be declared as such. Different research has taken place and a database has already been created courtesy of the WWF Nepal Programme on flora, fauna, and socioeconomic conditions (inclusive of traditional rites and rituals of the local people, especially for grazing and pasture).

Participation through the private sector is very critical. Can we rely only on private sectors for conservation? It is a big question and I do not have the answer. This forum could come up with some sort of answer, if not all answers. When we talk about conservation, law enforcement comes as one of the major components because many illegal activities have to be stopped. Whom do we trust? Do we give law enforcement responsibility directly to institutions? Therefore, a participatory approach must be there, and we have had several experiences in Nepal in which local committees can contribute to conservation. But, law enforcement should be with the government agencies which can be minimised into a small unit. We can proceed on two different levels for management: the macro-level and micro-level. On the macro-level, the principal question is the establishment of the area as a conservation area or protected area. The

other thing we need is collaboration and cooperation with major NGOs. So far, the WWF-Nepal Programme has been deeply involved along with other government agencies and ICIMOD has created the database. A big database has been collected which would be very useful for cooperating countries. On a micro-level, we can go through different local-level institutions such as the 'Kanchanjunga Development Committee', and many others. We also heard that, in Sikkim, India, there are many committees. What legal base do we have? Because, unless and until we create a protected area with a legal base, we will be desperate and confused. There are too many laws in Nepal, e.g., National Park and Wildlife Conservation Act and Forest Act. Along with these laws there are three regulations which I would like to mention here which are directly related to the proposed protected area. Conservation Area Regulations 2053 (1996), which are very recent, Forest regulations 2051 (1994), which are two years old, and Buffer Zone Regulations 2052 (1995). These three sets of regulations have provisions for an area to have been created and a mechanism developed for its management. Ecoregional conservation is the focus of this morning's session, so I have called it Eco-conservation on a Regional Basis. Nobody clarified what eco meant when somebody put that word there, because unless and until we combine 'economy' with 'ecology', I don't think sustainability will be there.

We can have uniformity of management on two levels. On a regional level, we can gather and exchange ideas and come up with some policy guidelines. The implementation of those policies is carried out at the local level in the field. In Nepal, there are many traditional rites. Although, the public lands are government lands which were nationalised in the mid-50s, a lot of peo-

ple in the Kanchanjunga area are still managing and prescribing who can take the cattle into which area and which sheds they can use. The lands are locally managed, despite the fact that the government has its own regulations and policies. Therefore, incorporating the cooperation of those people in conservation is essential.

A trans-frontier action committee could be formed from this meeting. I appreciate the steps taken by ICIMOD to organise this meeting and WWF for supporting it. The government alone cannot do things like this, so initiatives should be taken by other institutions. This action committee should facilitate conservation action. Eco-tourism should be taken as an enterprise. We are all talking about eco-tourism, and I don't know what it really means. I know what is there, has been documented. But those people who are really running the show are right. I may make some money from tourism. Is that all we are talking about? Control of illegal activities is very important because I personally was involved in many raids. Kanchanjunga may not be directly affected by this but, if we have a Joint Action Committee, it would provide us with an opportunity to exchange information on all the management and the implications of illegal activities in different areas. Income-generating activities should be promoted. Training and capacity building are very important. We should be able to go to the local level and train them in conservation, and that needs research. If we do not have any information, we cannot talk. If the G.B. Pant Institute establishes some sort of database on GIS applications, they can share it with ICIMOD, for example, which has enough information stored. This kind of exchange is very important. I want to share our experiences on core protected area and buffer zone management. In the Annapurna Con-

servation Area, which was established with a different concept from that of simply a protected area, we are still undergoing experiments and we have yet to see whether those concepts which we had adopted are evolving and changing every decade, for example. In the last two decades, we have carried out changes in three different phases, so we have to see where we will be in the next decade or two. Thankyou.

Discussion

Mr. Brian Penniston, Representative of the Mountain Institute, remarked that the Annapurna area was delegated to the King Mahendra Trust. He further questioned what would be the new situation for the Kanchanjunga area, which department would have the mandate to control all the activities there, and what would be the relationship of the department with local bodies such as the VDCs (Village Development Committees)?

Mr. Kattel replied that the Annapurna Conservation Area was delegated to King Mahendra Trust and, with experience, it had been conceptually adapted. The government could not give it completely into the hands of the

local people because of law enforcement which was a very important component. Law enforcement should always be the prerogative of the government, he stated, but local people should be mobilised to provide, through local institutions, the core unit of the law enforcement group with minimum staffing. This had been the concept.

Mr. Javed Hussain of the WWF-Regional Office, Thailand, remarked that they had been talking about biodiversity, cultural diversity, and social diversity, and, if that was the structure, there could not be one single model. There would be diversity of actions and models so there was not going to be a single prescription which could apply everywhere. In the workshop group there should be some commonality. They should focus on local diversity and localised approaches.

Mr. Kattel answered that this was very important because they needed to be site-specific. Things which were successful in the lowlands of the *Terai* might not be effective in the highlands. Unless and until one small unit was institutionalised, growth would not take place.

Outcome of Group I

The participants in Group I discussed 'A Common Framework for Biodiversity Assessment and Monitoring'. The six participants discussed different aspects of the issues. The outcome of this discussion is provided below.

Participants	Mr. Gut Lepcha	Dr. R.K. Avasthe	Mr. Pradip Regmi
	Mr. Devendra Amatya	Dr. K.K. Shrestha	Mr. Javed Hussain

Presentation

PHASE I Planning

1. **Goal** : To develop a common framework for biodiversity assessment and monitoring.
2. **Objective** : Conservation of the Kanchanjunga Mountain Ecosystem.
3. **Activities**

(A) Assessment

1. Development of a Methodological Framework Output - Manual
 - i) Standardisation of Nomenclature (Flora and Fauna)
 - a. Scientific Names
 - b. Common English Names
 - c. Local Names
2. Categorisation of Land-use Types
 - a. Scale of Assessment and Monitoring (Flora and Fauna)
 - b. Indicators (Flora and Fauna)
3. Categorisation of Resource Use Types

(B) Monitoring

1. Monitoring Based on Assessment
2. Mechanism: Technical Exchange Programme
 - a) Identification of Resource Persons (from each country) and by required disciplines (June-Aug. 1997)
 - b) Technical Workshop (Oct.-Nov. 1997) for development of a methodological framework, as mentioned above under Assessment.
 - c) Resource Person Exchange (Field Assessment) - (March-May 1998)
 - d) Report Preparation - Distribution - Evaluation (July-Aug. 1998)
 - e) Assessment and Planning Workshop (Sept. - Oct. 1998)

3. Budget:

- | | |
|--|--------------|
| 1. Development of a Methodology (Manual) | US\$6,000/- |
| Consultant and Consultancy | |
| 2. Categorisation of Land-use Types / | US\$6,000/- |
| Categorisation of Resource Types | |
| Consultant and Consultancy | |
| 3. Activities : | |
| a) Technical Workshop | US\$15,000/- |
| b) Pilot Study | US\$40,000/- |
| i) In-country | |
| ii) Trans-regional | |
| c) Workshop | US\$20,000/- |
| i) Planning Phase Evaluation | |
| ii) Project Development and Planning | |

Phase II**Implementation Phase**

Operational and Management Cost	- US \$ 13,000/-
TOTAL COST	- US\$ 100,000/-

Outcome of Group II

The participants in Group II discussed "A Common Framework for Sharing Conservation Benefits with the Local People". The outcome of their discussions is provided in Table 1.

Participants

Ms. Fahmeeda Hanfee	Mr. A.L. Joshi	Mr. Pradeep Mool
Dr. Eklavya Sharma	Mr. Brian Penniston	Mr. Ajay Rastogi
Mr. D.D. Sharma		

GOAL: There should be a strong link between conservation and community benefits, so that local people would develop a purposeful stake in conservation and sustainable use of natural resources.

APPROACH: The perception of 'benefit' largely depends on the socioeconomic and cultural aspirations of the people. At the same time, all community benefit activities may not have positive linkages with conservation objectives and vice versa. Therefore, research needs to be undertaken to identify, plan, and implement the activities that fulfill the dual objective of conservation and development.

There are different types of development schemes currently being undertaken in the three countries. Sharing information on all aspects of these ongoing and future development programmes could prove very useful in initiating a comprehensive strategy that enables sustainable development of the Kanchanjunga Mountain System.

Preliminary discussions in the group led to the following Table (see Table 1) that outlines the activities and establishes community and conservation links.

Table 1: Group II Common Framework for Sharing Conservation Benefits with Local People

Benefits	Community	Conservation Link
Tourism Domestic and Foreign	<ul style="list-style-type: none"> - lodge operators and campsite management • services - roads, guides, porters • indigenous products - consumables, handicrafts, etc • transport - yak, dzo(s), jeeps, etc 	<ul style="list-style-type: none"> - sustainable use during tour souvenirs, etc - minimum environmental impacts - alternative energy (kerosene, blankets, etc)
Genetic Resources	Forests - fuel, fodder, construction, pasture/grass	community managed forests
Animal and Plants	NTFP collection, med. plants, edibles	- sustainable use (wild species)
Wild Domestic	<ul style="list-style-type: none"> - construction materials - bio prospecting - ornamental flowers, land races, plant stocks, domestic crops. • animal parts, genetic stocks, hunting pets, fishing • meat, dairy, skinning + wool, transport, manure, ploughing, construction materials 	vegetable seed production - maintenance of genetic stock (plants and animals) - manure (soil conservation values)
High-value Natural Resources	extract mines, quarry - construction materials, precious stones	- value-added (i.e., rings, etc.)
Water Power hazard control	<ul style="list-style-type: none"> - micro-hydel, employment subsidy and benefits, ghats(s) (milling) - irrigation, drinking, soil fertility, land stabilisation, cash crops, flood control, lake management 	- landscape/watershed protection/ downstream benefits
Culture Antiquities (rugs) trade, etc.	religious centre + pride, tourism revenues, employment, festivals - ecological knowledge (avalanche safety, flood, etc.)	Cultural/religious prohibitions monasteries, etc reverence for nature and culture historical importance, appropriate technologies (bamboo), medicinal practices - (no hunting, fishing, etc.)
Aesthetic Flora and fauna - viewing, photography Landscape - mountain climbing, viewing Lakes and waterfalls, Trekking	knowledge (guides, plants, etc) - services - attraction - fees (climbing, viewing, eating)	direct payment for knowledge/services - fee sharing with community e.g. buffer zone
Global/Regional carbon sequestration global climate global genetic resources networking	<ul style="list-style-type: none"> - indirect research/employment - info. sharing, networking, training - indirect information exchange - indigenous knowledge system employment (bankers, etc.) 	- global links + long-term interests

Outcome of Group III

The members of Group III discussed 'A Collaborative Arrangement for Cooperative Management of the Kanchanjunga Mountain Ecosystem'. All the participants discussed the topic at length and came to the conclusions given below.

Participants	Mr. P.K. Basnet	Co-chairperson:	Dr. R.K. Rai India,
	Mrs. B. Zong	Dr. B. Kattel	Mr. M. Sherpa
	Prof. P. Shengji	Mr. D. Rana	Mr. D. van Blitterswijk

Presentation

Goal

All the three respective governments should endeavour to designate their respective areas of Kanchanjunga Mountain Ecosystem protected areas by the year 2000.

Regional Collaborative Arrangements

Approach

1. Conservation activities to be implemented by individual countries by maximising people's participation for poverty alleviation: micro-enterprises, income-generating activities, and a cooperative movement.
2. Establishment of a Coordination Forum for Conservation involving three regional countries with ICIMOD as the facilitator.
3. Tri-national expert coordination meetings should be held on a rotational basis to focus on the transboundary issues.
4. The responsible authorities should be mobilised through meetings to plan for local-level policies.
5. Collaboration can be carried out at three levels.
 - a) National Level
 - Pushing policy action collaboration
 - Making necessary regulations
 - Organising joint planning for management
 - b) Local Level
 - Establishment of management collaboration between offices and local bodies
 - Joint planning and implementation
 - (c) Regional Level
 - Transboundary collaboration to establish a mechanism

Activities/Issues

- a) Protection of migratory species
- b) Illegal trade
- c) Fire control
- d) Exchange of information
- e) Capacity building and training

Assist in the implementation of international conventions

Day Three

Technical Session Four

Chairperson
Professor Pei Shengji

RECOMMENDATIONS

There was a discussion on the draft recommendation. Almost all the participants agreed that the time frame mentioned in the draft should be changed to accommodate all the three countries, giving them sufficient time for management. Therefore, November 1997 was the time suggested and finalised for establishing a Kanchanjunga Mountain Ecosystem Forum. This forum will design, plan, and implement a Regional Planning Workshop by March 1998.

The other point which was raised was that WWF should also be mentioned as the facilitator along with ICIMOD. This was approved by all the participants.

It was thought that the Regional Planning Workshop should be responsible for the different activities for the proposed Protected Area by March 1998.

Final Recommendations

A regional workshop was held in Kathmandu to discuss common issues and an agenda for the conservation of

the Kanchanjunga mountain ecosystem. Kanchanjunga is the third highest mountain in the world, straddling the borders of the Tibetan Autonomous Region (TAR) of China, India, and Nepal. Hence, they share a common vision for the conservation and development of the Kanchanjunga Mountain Ecosystem.

The workshop participants recommended the following.

1. Respective governments should provide a policy, institutional, and management framework for their respective areas that will ensure that the Kanchanjunga Mountain Ecosystem is a functional Protected Area (PA) system by the year 2000, so that conservation policies, programmes, and projects will help conserve, maintain, and enrich the ecological, sociocultural, and economic integrity of the ecosystem.
2. By November 1997, Kanchanjunga Mountain Ecosystem Coordination Forum, facilitated by ICIMOD and WWF and comprising of officials and

- experts of the three countries and NGO partners, should be established. This forum is to identify and constitute an interdisciplinary experts' team from all the three countries that will design, plan, and implement the Regional Planning Workshop by March 1998.
3. The Regional Planning Workshop should identify a common framework, methodology, and protocol for the development and documentation of a knowledge and information base, ecological and monitoring assessment, and socioeconomic needs' analysis of the proposed PA by March 1998.

4. A participatory process is to be used for the planning, implementation, and monitoring phases. Activities are to be planned in active consultation and partnership with the local communities.
5. Conservation and development activities should ensure that the benefits from the conservation policies and programmes to the local communities are maximised and that the costs to them are minimised.
6. The respective governments should ensure institutional and budgetary provisions for the project activities in their respective territories.

Day Three

Concluding Session

Mr. Robert Pollack
Director General, ICIMOD

First of all I would like to apologise for not being in a position to participate or contribute to the proceedings of this workshop. The few times I listened, I was very impressed by the commitment and enthusiasm of the different participants, whether of the person giving the first introduction or whether it was of those taking part in follow-up discussions or involved in the intensity of discussion on recommendations this morning. If the recommendations are adopted without discussion, it is very unlikely that the recommendations will be followed up. But, when so many people put space in discussing the recommendations, it is a sign that the matter has been taken very seriously. Therefore, I am very pleased to note the discussion. I am also happy that ICIMOD is associated with this workshop.

You must have noticed that there was front page information about Kunchanjunga in 'The Kathmandu

Times' of the 12th of May. This was a very good management of the workshop. The presence of ICIMOD's role in bringing countries, governments, NGOs, and scientists together on a common platform and with a common interest for the well-being of the mountain people in the Hindu Kush Himalayas and of their environment. I was very pleased to note in the recommendations that a collaborative research framework, as well as environment and development are very well reflected. As I mentioned in my opening speech, one of the Members of Parliament had asked during the Parliament, that, unfortunately, Kathmandu was closed yesterday, and, unfortunately, a Member of Parliament, Mr. Bhanu Prasad, I am not pleased that on the 12th of May we are talking about Kunchanjunga's conservation and development, as that was not going to both aspects.

CONCLUDING REMARKS

Mr. Egbert Pelinck
Director General, ICIMOD

First of all I would like to apologise for not being in a position to participate or contribute to the proceedings of this workshop. The few times I listened, I was very impressed by the commitment and enthusiasm of the different participants, whether of the person giving the first introduction or whether it was of those taking part in follow-up discussions or involved in the intensity of discussion on recommendations this morning. If the recommendations are adopted without discussion, it is very unlikely that the recommendations will be followed up. But, when so many people participate in discussing the recommendations, it is a sign that the matter has been taken very seriously. Therefore, I was very pleased to note the discussions. I am also happy that ICIMOD is associated with this workshop.

You must have noticed that there was front page information about Kanchanjunga in 'The Kathmandu

Post'. The fact that the photograph portrayed the Ambassador of China looking at a display of photographs on the Indian Himalayas was very significant. This is what ICIMOD tries to do by working on transboundary collaboration, whether on tourism, watershed management, or biodiversity. The essence of ICIMOD's role is bringing countries, governments, NGOs, and scientists' together on a common platform and with a common interest for the well-being of the mountain people in the Hindu-Kush Himalayas and of their environment. I was very pleased to note in the recommendations that a collaboration, common framework, as well as environment and development are very well reflected. As I mentioned in my opening speech, one of the Members of Parliament had other duties in Parliament. But, fortunately, Parliament was closed yesterday, so, since yesterday, a Member of Parliament has been present. I am also pleased that, on the Nepal side, we are talking about Kanchanjunga's conservation and development, so that we are looking at both aspects.

I listened to discussions yesterday on Sikkim — about how people can benefit from the numerous tourists that are coming. Sometimes we have looked at negative impacts, but the development perspective has been maintained during your discussions. Eighty or 90 per cent of the people around the table have a conservation mandate and a conservation background. Conservationists were conserving 20 - 30 years ago, and they are still conserving. They do so by using different tools of participation, by listening to people, by looking at maximising benefits but, indeed, also, by reducing some of the negative impacts. But, the group here, very much together, gives me hope for the future of Kanchanjunga. That is a future in which we can see a unique ecosystem, one of the highest mountains in the world, being preserved, a vision of environment that is spreading across the Himalayas.

Since Kanchanjunga is located in the Eastern Himalayas, it is quite important from the perspective of biodiversity. Not only the ecosystem but also the cultural diversity is being protected. The long history of that part of the world may be changed through the process of planning for development and conservation. Our achievement, during two and a half days of bringing three countries together on a platform of commitment to sustainable conservation and management of the Kanchanjunga ecosystem, is quite remarkable.

I think several practical steps have been taken in which we acknowledge mutual strength and we accept that everything cannot be done straight away. I think there is more strength in the national commitment. What is being done by the national government and by the local government? This is very important. The next step is how we can bring those commitments together. I noticed that all of you would

like to see a continuation of the dialogue that started this week, maybe at the end of the year or early next year. But the dialogue is continuing.

That brings me to the role of ICIMOD. More important is the role that ICIMOD plays in bringing countries together and, in some cases, some of the multidisciplinary of our activities. In future, ICIMOD will be happy to collaborate with you, particularly with WWF, in continuing this process of dialogue. We will be happy to facilitate and to bring people together. Maybe, sometimes, we should encourage exchanges between two countries, but we are in your hands concerning what ICIMOD should contribute. Whenever we talk about ICIMOD, it should concern the added value we have. The added value is that we have an organisation that emphasises regional collaboration as well as multidisciplinary. We not only talk about conservation but, also, if you need advice on gender, tourism, agrobiodiversity, and other subjects, we will be happy to add that kind of expertise to what you bring yourself.

I would like to thank all of you for your very active involvement in the discussions. I am particularly happy that the participants from the Tibetan Autonomous Region came all the way from Lhasa. I hope it has been useful to you. We are looking forward to crossing the boundary and seeing what is happening on the Tibetan side. I was very pleased with the information that was provided and hope it can be incorporated in the overall proceedings. I am very happy with the large presence from Sikkim, with the Principal Chief Conservator for Forests' Secretary leading the delegation. I am not sure if I am allowed to say that he is leading a delegation which includes NGOs, but I was very pleased that the Sikkim delegation included the government, NGOs, and semi-government organi-

sations - the GB Pant Institute, for example.

I think everything went smoothly in terms of the collaborative arrangements we need to develop Kanchanjunga. In looking at mutual strength, we ask what is the strength of the government? what is the strength of the NGOs? what is the strength of the scientific institutions? Added together, you are bound to come up with a good programme.

I am also very happy with the presentation from Nepal. First of all, the Foreign Minister opened the workshop as well as the photo exhibition. We also have very high-level representation from the Ministry of Forests and Soil Conservation and the Department of National Parks and Wildlife Conservation. This is a very good indication. WWF was both an organiser and a partner in this meeting. We are happy that representatives from WWF-Bangkok and WWF - International, Gland, could attend. This is the first time that ICIMOD has had a collaborative programme with WWF. For many years, we have interacted at workshops and seminars but this is the first time that we had a formal agreement and joint organisation. I am really looking forward to other types of collaboration.

I am very happy that the Government of India was represented by Dr. Rai who is very close to members of the ICIMOD Board of Governors and the Secretary of Environment and Forests, and I am happy that you could participate also. Unfortunately, the representative from Beijing was held up at the airport and could not participate, but I understand he had a keen interest in this programme. Last, but not least, I hope it has been useful for the DGIS Liaison Officer, whose interest lies in the Mechi Zone, to listen to the conservationists from the higher mountains. At ICIMOD, we consider

highland-lowland interactions extremely important. What happens in the higher mountains can be of interest for the lower areas, but, sometimes, the people from the highlands can also benefit from those from the lowlands. I think we noticed that, in Sikkim, the people from the lowlands came as tourists to the highlands and benefited the people there. I hope this has been useful to SNV.

It was very interesting for us to work together with TRAFFIC - India. The whole issue of transboundary trade in wildlife products is something that ICIMOD has never tackled before. I would also like to thank Brian Penniston, the representative from the Mountain Institute, because many of us can benefit from the experience they had and that of the Department of National Parks in the Makalu/Barun area. Thank you very much for your collaboration and your interest. ICIMOD is very keen to continue this dialogue, and whatever we can do within our means, we will be happy to assist you.

Thankyou very much.

**Mr. Mingma Norbu Sherpa,
Country Representative, WWF
Nepal/Bhutan Programme**

First of all I would like to thank ICIMOD for taking this initiative and helping organise this regional workshop in a marvellous way. Thanks are due especially to Prof. Pei Shengji, Ajay Rastogi, and Devendra Amatya of the WWF Nepal Programme. I would also like to thank WWF International who will actually foot the bill. More important were the participants because, for me, it was a very useful forum with people from Taplejung, Sikkim, Tibet, Delhi, and Kathmandu interacting. The lessons learned here are going to go a

long way, and it has been impressive in terms of sharing knowledge about policy implementation at field level. So, I think this is really useful, and I am glad to see that you have asked ICIMOD and WWF to play a role again in future to further this kind of collaboration. Professor Pei and I will convene next week and I will see what we can do in terms of talking to donors as well as in exchanging information. WWF has a presence in India, Nepal, Bhutan, and China, especially for the Kanchanjunga Mountain Ecosystem, so we will be very happy to work with the government and NGOs and other development agencies to share our experiences on biodiversity conservation and also on integrating conservation and development. This is something that we have really been working for over the last 10-15 years. Our experience for the last 30-40 years is that we cannot just protect wildlife in one particular area, we have to think about a wider landscape. We are coming up with an ecoregional map, because wildlife has no boundary. They do not see the political boundaries. So, we are promoting this ecoregional approach or a landscape approach to conservation, which is more important in terms of transborder reserve systems or trinational reserve systems. There will be more collaboration in information sharing between countries in conservation of biodiversity. We are very happy to be a partner of ICIMOD for this workshop, and we look forward to being a partner in the future. This workshop has been a great success. I am very pleased to have people from the ground implementation level to the policy level, the NGOs, and the Member of Parliament from Taplejung. Even the politicians and the local communities are now talking about conservation as a means of economic development. I think this is something which is good for conservation. I would like to thank everybody who partici-

pated, shared information, and took part in the discussions. I enjoyed all the discussions that took place and the interactions that we had. Once again, I would like to thank ICIMOD for making excellent arrangements.

Thankyou.

Dr. Eklavya Sharma, Scientist in-Charge, G.B. Pant Institute for Himalayan Environment and Development, Sikkim Unit, Sikkim

Director General of ICIMOD, Mr. Egbert Pelinck, Mr. Mingma N. Sherpa of WWF, Professor Pei, and friends, we were here for the last three days and there has been active participation on the part of all the participants, and I have been asked to speak now on behalf of them. First of all, I would like to thank ICIMOD and WWF for organising this excellent workshop. In fact, the composition of the participants is very good. We had managers, scientists, and some of the people actually working in the field—like the Hon'ble Member of Parliament from Taplejung and the NGO participants. We had a lot of interaction, and it has been a learning experience for us.

Secondly, people from three countries who are very close, are living and working in similar conditions, but who never interacted earlier, came together. This was a good exercise in coming together around one table and discussing what we have, what are the potentials, and what we can do to conserve this unique Kanchanjunga Mountain Ecosystem. So, it was a good exercise in terms of gain for the participants. I personally have gained a lot from this workshop. On behalf of the participants, we strongly feel that

the recommendations which have been made should be followed up with a lot of commitment by the respective countries, as we have already gone through the recommendations and we have agreed to them. As participants, we have commitment from the government side as well, and we look forward to ICIMOD and WWF calling two follow-up meetings and a framework workshop. I would like to thank the ICIMOD staff and WWF who have made our stay comfortable. Ms. Fahmeeda came to me and said that she did not know much about Kanchanjunga before, but, after so much discussion she felt confident about attending future workshops.

Thankyou.

Chairperson's Remarks

Finally, I thank all of you for your excellent contributions and your collaboration in making this workshop successful. The fact that the workshop has been successful is evident from the six recommendations and important information provided by all of you and the outputs from the three group discussions. I would like to thank the Director General of ICIMOD and the WWF Representative to Nepal for supporting this workshop on time. I would also like to thank my colleagues, Mr. Amatya and Mr. Rastogi, for coordinating this workshop, and also the staff who supported this workshop in different ways through logistics and secretarial work. I finally declare the workshop closed.

Annexes

*Dr. Prakash Chandra Lamsal
Minister for Forests, Animal Resources and
Environment, Nepal*

Your Excellencies, Ladies and Gentlemen

As a man from one of the most mountainous countries on earth, I am very happy to be opening this exhibition on Himalayan biodiversity and the Workshop on Kanchenjunga Conservation. When ICIMOD opened its doors in 1983, concern for the environment was still in the formative stages. True enough, the prophets of doom had begun to write about the ominous trends in terms of environmental degradation in the plains and in the rain forests, the increasing deforestation had touched the borders of the so-called world's consciousness, but who cared about or even thought about the mountains? And then came ICIMOD, the world's first international centre for integrated mountain development. It gave us a mountain perspective.

It is true that, in mountain areas, as everywhere, economic development is at the forefront of thinking among politicians and other people. But the United Nations Conference on Environ-

ment and Development (UNCED) has also taught us that economic development and environmental conservation are two sides of the same coin. One cannot prosper with neglect of the other. In June of this year, a Special Session of the General Assembly of the UN will convene to review the progress made with the implementation of Agenda 21 - UNCED's major commitment to the 21st century. Nepal feels proud that, by hosting ICIMOD on its territory, it is closely associated with the implementation of Chapter 11 of Agenda 21 - Managing Fragile Ecosystems, Sustainable Mountain Development.

The Hindu Kush-Himalayas give us the story of 45000 species of flora and fauna. There may be 2000 species in their mountains that we have never heard of or seen. I am sure that this exhibition and exhibition is as much as a good deal. Along with there is a great adventure in sharing. Rich and many environmental workers from ICIMOD will bring together a collection of people who will give them an opportunity

Annex 1

INAUGURAL ADDRESS

DR. PRAKASH CHANDRA LOHANI
MINISTER FOR FOREIGN AFFAIRS, HMG/N

Your Excellencies, Ladies and Gentlemen

As a man from one of the most mountainous countries on earth, I am very happy to be opening this exhibition on Himalayan biodiversity and the Workshop on Kanchanjunga Conservation. When ICIMOD opened its doors in 1983, concern for the environment was still in the formative stages. True enough, the prophets of doom had begun to write about the ominous trends in terms of environmental degradation in the plains and in the rain forests; the increasing deforestation had touched the borders of the scholarly world's consciousness, but who cared about or even thought about the mountains? And then came ICIMOD, the world's first international centre for integrated mountain development. It gave us a mountain perspective.

It is true that, in mountain areas, as elsewhere, economic development is at the forefront of thinking among politicians and other people. But the United Nations Conference on Environ-

ment and Development (UNCED) has also taught us that economic development and environmental conservation are two sides of the same coin. One cannot prosper with neglect of the other. In June of this year, a Special Session of the General Assembly of the UN will convene to review the progress made with the implementation of Agenda 21 - UNCED's major commitment to the 21st century. Nepal feels proud that, by hosting ICIMOD on its territory, it is closely associated with the implementation of Chapter 13 of Agenda 21 - "Managing Fragile Ecosystems: Sustainable Mountain Development."

The Hindu Kush-Himalayas store water, they store diverse species of flora and fauna. There may be much wealth in these mountains that we have never heard of or seen. I am sure that this workshop and exhibition will teach us a good deal. Above all, there is a great adventure in sharing. Each and every international workshop that ICIMOD holds brings together a collection of participants and gives them an oppor-

tunity to learn from each other and to share their knowledge with other partner organisations. I am particularly pleased to see that an international centre such as ICIMOD has joined hands with a local NGO - the World Wildlife Fund Nepal Programme - to discuss conservation of the Kanchanjunga ecosystem.

Located in the northeastern corner of Nepal, the Kanchanjunga massif also straddles Tibet in the north and Sikkim in the east and is recognised as the transition zone between the Central Himalayas and the Eastern Himalayas. I am extremely glad that this unique ecosystem that knows no political or geographical boundaries has brought together experts from our neighbouring countries to discuss common problems and find common solutions to them. I am also happy to learn that the Himalayas - in this case the Indian Himalayas and the Trans-Himalayas - have evoked the interests of two popular photographers, one British and the

other American, in capturing the image of the Himalayan uniqueness with their cameras.

As the Minister for Foreign Affairs, I am pleased that I have the opportunity to open such an international event right here on my own doorstep, so to speak. I am happy to note that the British Council is the progenitor of the section of the exhibition on mountain diversity in the Indian Himalayas, even though the mountains of the United Kingdom have long been 'sat upon' or flattened by geological events. Experts tell me we have much to learn from old mountains because our mountains are very young.

With this in mind, I inaugurate this exhibition and workshop. I wish the participants a fruitful stay in Kathmandu and we look forward to some fresh thinking based on rich, diverse, and not necessarily young, wisdom.

Thankyou.

WELCOME ADDRESS

*MR. EGBERT PELINCK,
DIRECTOR GENERAL, ICIMOD*

Your Excellency, Ambassador of the People's Republic of China, Representative of the Embassy of India, Senior Officials of HMG Nepal, Ms. Sarah Ewans, Director of the British Council, Mr. Mingma Norbu Sherpa, Director of the WWF Nepal/Bhutan Programme, Distinguished Participants, Ladies and Gentlemen.

On behalf of the World Wildlife Fund Nepal Programme, the British Council, and the International Centre for Integrated Mountain Development, it is a pleasure for me to welcome you all to the inaugural session of the Regional Workshop on the Management of the Kanchanjunga Ecosystem and the opening of the Photographic Exhibition on 'A Vision of the Indian Himalayas and Biodiversity of the Trans-Himalayas'. We feel particularly honoured that the Foreign Minister, Dr. Lohani, has just inaugurated the workshop and exhibition despite his heavy schedule and other important engagements.

The Regional Member Countries of ICIMOD - Afghanistan, Pakistan, In-

dia, Nepal, Bhutan, Bangladesh, and Myanmar - share a biological richness that makes this region one of the world's 'hotspots' for biodiversity conservation. They also share a physical beauty and cultural diversity that attract hundreds of thousands of tourists every year. Within this context, ICIMOD is happy to have brought together this morning the participants to the Regional Workshop on the Kanchanjunga Mountain Ecosystem in an environment in which the beauty and biodiversity of the Indian Himalayas and the Trans-Himalayas have been captured by two excellent photographers, as shown in this exhibition.

The diversity in culture, ecology, and biology offers enormous challenges as well as potentials for sustainable development. I am pleased that against the backdrop of this beautiful exhibition, which covers a large part of ICIMOD's 'territory', the workshop will focus on one particular geographical area, the Kanchanjunga Ecosystem. I am also pleased that we will do so

with experiences and visions from the three countries to which this important ecosystem belongs.

Management of ecosystems includes equal attention to both the human and conservation values, as it has become increasingly clear that sustainability of biodiversity conservation can only be assured if a holistic approach is adopted in which not only a particular area is protected from human interference, but also in which the rightful aspirations of the local people, the traditional custodians of the natural environment, are adequately taken into account. I am therefore also very grateful to the Honorable Member of Parliament, representing Taplejung District, for his participation in this workshop.

Ecosystem management needs biologists, but it also needs the knowledge of agronomists, social scientists, and development workers closely associated with promoting the well-being of the local people. We, at ICIMOD, apply two major approaches to nearly all of our activities that are also very relevant to this workshop: regional collaboration and multidisciplinary.

While experts will deliberate during the workshop on the technical matters in greater detail, I would like to highlight some of the prominent concepts of regional collaboration in transboundary ecosystem management. This concept is gaining popularity all over the world, resulting even in the establishment of formal 'Transboundary Protected Areas'. They are defined as contiguous areas of protected natural habitat, extending nationally across two or more states or provinces, and internationally across two or more countries. The main aim of transboundary reserves is to increase the protection of biodiversity of a particular ecosystem beyond that which can be achieved by a single state, province, or country. The main

issues that surface largely in these discussions not only relate to biodiversity, but also to economic, cultural, and political issues. I would like to touch upon a number of challenges you have before you in the next three days.

Firstly, What do we know about the ecological boundaries of the different sub-ecosystems of this vast area. Does each of the three countries use the same criteria?

Secondly, What is the legal status and land tenure and land-use system of each of these sub-ecosystems in each of the three countries?

Thirdly, What is the status of legal and illegal transboundary resource exploitation and human migration and how does this affect conservation?

Fourthly, What are the present policies of the respective governments in relation to the sustainable management of the Kanchanjunga Ecosystem?

Fifthly, once we have the answers to these questions, or at least once we have agreed upon how to get the answers, how to promote regional collaboration in the sustainable management of this unique ecosystem within an agreed framework of common understanding of the problems and opportunities for both the conservation of the environment and alleviation of the poverty of the people who are part of and depend on this ecosystem? As this is also the dual mandate of ICIMOD, we are happy to be partners with WWF in initiating this dialogue across borders.

Excellency, Ladies and Gentlemen, I thank you for all the interest shown in the subject of biodiversity conservation in this region by yourselves and the participants at the workshop, - I am looking forward to the outcome of your deliberations.

Thankyou.

INTRODUCTION TO THE WORKSHOP

MR. MINGMA NORBU SHERPA

WWF NEPAL PROGRAMME

I am honoured to have this opportunity to present the objectives of the regional workshop on the **Conservation of the Kanchanjunga Mountain Ecosystem**. Kanchanjunga, the third highest mountain in the world, lies on the borders of China, India, and Nepal. This presents a unique opportunity for joint collaboration for conservation. This is one of the reasons why we are gathered here today.

The Kanchanjunga mountain system encompasses unique environmental and cultural characteristics. These characteristics make it highly desirable to include the region in the Himalayan protected area network. This area also lies in the Eastern Himalayas, one of the 10 global, biological hotspot sites. Kanchanjunga is home to endangered species of wildlife, an outstanding diversity of vegetation, and a fascinating assemblage of ethnic groups who have maintained their traditional identities, cultures, and religious practices.

Situated in the northeastern corner of Nepal in Taplejung District, the pro-

posed Kanchanjunga Conservation Area borders Sikkim in India and the Tibetan Autonomous Region of China. Thus, the creation of a conservation area there represents an unparalleled opportunity for transboundary conservation.

Kanchanjunga is comprised of intact and increasingly threatened habitats of endangered species such as the snow leopard (*Panthera uncia*), musk deer (*Moschus chrysogaster*), Himalayan black bear (*Selenarctos thibetanus*), wolf (*Canis lupus*), blue sheep (*Pseudois nayaur*), goral (*Nemorhaedus goral*), serow (*Capricornis sumatraensis*), and spotted leopard (*Panthera pardus*). The Himalayan larch (*Larix griffithiana*) and extensive juniper (*Juniperus* sp) forests found there are unique to this part of the Himalayan eco-region. The Kanchanjunga area is also justly renowned for its high peaks. There are eleven peaks (which are more than 7,000m high) and extensive glaciers, making it a significant watershed area in all three countries.

A growing local population, poaching, shortened cycles of slash and burn agriculture, and encroachment on forests, however, threaten the pristine state of Kanchanjunga's ecosystem. These problems are exacerbated by the lack of a proper management system.

In Nepal, the need for protecting the Kanchanjunga area has been felt since the early 1990s. In 1994, HMG of Nepal and WWF carried out a feasibility study of the Nepalese side of the mountain. A multidisciplinary team of biologists, natural resource management specialists, and socioeconomists travelled to the Kanchanjunga region for over three weeks. During their field work, the local people provided first-hand information on the importance of the area. Necessary information was taken through participatory rural appraisal methods. Many meetings were conducted in each village. A district-level meeting was conducted at the end of the feasibility study at Taplejung Bazaar — the district headquarters — to discuss the findings of the feasibility study.

This meeting was chaired by the Member of Parliament and attended by all the concerned district-level government officers, businessmen, and social workers. This district-level meeting endorsed the idea of a Kanchanjunga Conservation Area.

The findings were then presented to the Ministry of Forests and Soil Conservation in Kathmandu. Another meeting was chaired by the State Minister of Forests and Soil Conservation and attended by the Secretary, all Director-Generals, and senior staff of the Ministry. The Ministry for Forest and Soil Conservation and the National Planning Commission endorsed in principle the idea of establishing a Conservation Area.

Since then, WWF, HMG staff from the Ministry of Forests, and development

agencies, such as SNV/Nepal, participated in further developing the project document in the field, taking into consideration the local needs.

I am pleased to report that HMG Nepal is in the process of declaring the Kanchanjunga region a 'Conservation Area'. The Indian side of Kanchanjunga is already a National Park.

The Kanchanjunga area's rich mosaic of ethnicity includes *Limbu(s)*, *Rai(s)*, *Gurung(s)*, *Chettri(s)*, *Tamang(s)*, and *Bhotia(s)*. Significant religious sites in the area attest to Kanchanjunga's rich cultural heritage. Due to its remoteness, the Kanchanjunga area has extremely limited infrastructure, marginalising the area's economy and inhibiting improvements in the local people's lives. The local people lack health care, education, and basic development.

One of the findings of the study is the need for transboundary conservation of the Kanchanjunga ecosystem between Nepal, China, and India. To date, there have been no coordinated efforts to conserve this unique ecosystem and control threats such as poaching, habitat incursion, and over-harvesting of plants.

Transboundary conservation is not new to Nepal. Very good efforts have been started by both the governments of Nepal and China with the establishment of Qomolangma Nature Reserve in the Tibetan Autonomous Region adjoining Nepal's Langtang, Sagarmatha, and Makalu Barun National Parks.

Recently, senior representatives of the governments of Nepal and India discussed transboundary conservation issues at a workshop in Kathmandu.

This regional workshop on the Kanchanjunga mountain ecosystem is to discuss a regional approach in conservation and development by bringing together professionals and policy-makers from China, India, and Nepal.

The three-day deliberations and consultations will cover topics of mutual interest in safeguarding the biodiversity of the area as well as in improving the socioeconomic conditions of the local people.

I also hope that an agreement will be worked out in the near future on setting up a tri-national peace park to protect the biodiversity of the whole Kanchanjunga Mountain Ecosystem.

INTRODUCTION TO THE EXHIBITION

*Ms. SARAH EWANS
DIRECTOR, BRITISH COUNCIL*

The British Council aims to promote an enduring understanding and appreciation of British thought, experience, and achievement across a wide spectrum, notably in the fields of education, science and technology (which includes environment also), and the arts. The British Council has been functioning in India since 1948 and as part of the British High Commission since 1972. The operation in India is the largest of the British Council's overseas' programmes with offices in Delhi, Bombay, Madras, and Calcutta and a staff of over 500.

The British Council Division's programme in the environmental sector has well-defined objectives of which the promotion of the best practice in the protection and sustainable use of natural resources, including biodiversity conservation, features prominently.

The Council manages training programmes in India and overseas for the Overseas' Development Administration and other clients. The Council

sponsors and organises exchanges of professionals between India and Britain as well as arranging high-level conferences and seminars.

This photo exhibition, entitled 'Himalayan Vision', is the outcome of the Council's continuing commitment to environment and sustainable development in India, taking the Himalayas as an example. The Himalayas (the abode of eternal snow) represents one of the richest natural sites of the Indian subcontinent and is unique in the biological, ethnic, and cultural diversity it supports.

This exhibition consists of photographs shot exclusively for the British Council by a British nature photographer, Heather Angel. It addresses a broad range of issues confronting the Himalayas. Heather was specifically commissioned by the British Council Division for the assignment, wherein she travelled extensively in the Himalayan region. Her great love for nature is reflected in the compositions of her photographs which transcend language

barriers and are appreciated by one and all.

Heather Angel is a former President of the Royal Photographic Society and is the author of many books on photographic techniques. She has led photographic teams to many remote parts of the world. In 1986 she was awarded an honorary Doctorate of Science from the University of Bath for 'distinguished work in wildlife photography'. She is currently a visiting professor in the Department of Life Sciences at Nottingham University.

The Himalayas, with their snow-clad peaks, have always been enigmatic, awe-inspiring, and mysterious. They are of utmost importance with respect to their strategic, ecological, economic, social, and cultural values. Spread over thousands of kilometres, the three factors of longitude, latitude, and altitude add to the complexity and multiplicity of the ecosystem, making it a rich repository of natural resources and biological wealth. The region provides varied climatic zones and ecological niches for plants, animals, and human beings.

The Himalayan glaciers are the source of major rivers that feed the vast, fertile Gangetic plains in the foothills.

Forests have been an integral part of our lives since time immemorial. Scattered descriptions of flora and fauna have been found in the holy books - the Vedas, Upanishads, Puranas, Ramayana, and Mahabharata. Planting of trees was considered pious. Trees were also planted for timber, fuelwood, and fruits. Chanakya, in his book 'Arthashastra', formulated certain guidelines for the promotion of forestry.

Tropical deciduous, tropical evergreen, moist temperate, dry temperate, subtropical, sub-alpine, and alpine pastures are the various forest types found

in the Himalayas. The vegetation of the western ranges is drought-resistant and cold-loving and includes gregarious populations of conifers such as chir, pine, deodar, fir, and spruce. The moist eastern ranges are inhabited by a variety of species with a dominance of epiphytes, orchids, ferns, oaks, rhododendrons, and bamboos.

The Himalayas are particularly rich in aquatic flora and fauna, with a number of perennial rivers emerging from their glaciers.

The Himalayas are a storehouse of plant wealth. This is comprised of more than 8,000 species with a mosaic of plant communities growing wild or cultivated in valleys, hill terraces, and exposed mountain tops all across the diverse agroclimatic mountain ranges. The species and community patterns change in the east-west direction with the two ends being structurally and climatically very different.

The Himalayas are amongst the richest zones in terms of species and habitat diversity and thus support distinct life forms. Sambar, wild boar, musk deer, snow leopard, and brown bear are some of the endemic forms found in the mighty mountains. Despite the richness, there are more endangered species here than elsewhere. The Sikkim stag has already become extinct. Typical examples are the musk deer and the Himalayan brown bear, which are highly endangered.

If the Himalayas can boast about their glorious wildlife, they can be equally proud of their birds. However, many of the endemic species are already on the verge of extinction.

Since time immemorial, man has used the Himalayan ecosystem in various ways to satisfy his needs and greeds. Indigenous and migrant communities inhabiting the various hill ranges have depended entirely on its biotic and abi-

otic resources for their subsistence - cultivation in terraced fields, pastoralism, lumbering, and collection of firewood. Being an integral part of nature and its biological wealth, the relationship should be one of harmonious co-existence.

The escalating human population has exerted great pressure on the fragile ecosystem. Fulfillment of the needs for food, fuel, and shelter from existing resources has already strained the supporting capacity of the local environment. It is in great danger of depletion and erosion due to two main causes - natural and man-made. This has resulted in an alarming decrease of flora and fauna. We must utilise the enormous potential of mountain areas in a responsible conservation-oriented manner.

To reap long-term benefits and preserve the natural biodiversity, economic development that is ecologically sound should go hand-in-hand with cultural change. A research and moni-

toring programme to assess the current status and rate of loss of Himalayan biodiversity is the need of the hour.

There are fifty protected areas in this zone. However, field conservation measures have yet to produce any significant change.

What is utilised or exploited needs to be replenished and preserved. A holistic approach is required for effective management and conservation of our natural resources. Full participation of local people in their own development must be the focus of all conservation efforts. Integration of ecologically effective traditional practices with development activities would be beneficial.

Repeat photography is a useful monitoring tool. These photographs of sites taken more than a hundred years ago are compared with those of the same site taken recently, to illustrate the extent of change, if any.

Annex 2

PROGRAMME OF THE WORKSHOP

Day 1: March 31, 1997

09:00 – 10:00 Registration at ICIMOD

10:00 – 11:00 Inaugural Session at the Russian Cultural Centre

Speech of the Chief Guest - Dr. Prakash C. Lohani - 10 min.
 Welcome Speech - Mr. Egbert Pelinck - 10 min.
 Introduction to the Workshop - Mr. Mingma N. Sherpa - 10 min.
 Introduction to the Exhibition - Ms. Sarah Evans
 Inaugurate the workshop by lighting the lamp and inaugurate the Exhibition
 Vote of Thanks
 Tea and Refreshments - Ms. A Karki - 5 min.
 Group Photo

Technical Session One

Overview of Kanchanjunga Region for Biodiversity Conservation
(Half an hour of presentation and 15 min for discussion)
Chairperson : Prof. Pei Shengji
 11:30 – 13:00 Report from Nepal Dr. T.M. Maskey, DG, DNPWC, Nepal
 11:30 – 12:00 Mr. Gut Lepcha, Director, KNP
 12:00 – 12:30 Report from India Forest Department, Sikkim
 12:30-13:00 Ms. Ban Zong, DDG, QNP, Department of Forestry
 Report from China of Tibetan Autonomous Region
 13:00 – 14:00 Lunch at ICIMOD Guest House

Technical Session Two

*(20 min. of presentation and 10 min. discussion)**Chairperson : Dr. R K. Rai*

14:00 – 17:00 Key Issues in the Conservation of the Kanchanjunga Region
 14:00 – 14:40 Report on Vegetation - Prof. Pei Shengji and K.K. Shrestha
 14:40 – 15:00 Tea
 15:00 – 15:40 Report on Wildlife - Mr. Devendra Amatya, WWF, Nepal
 15:40 – 16:20 Report on Socioeconomics - Dr. Eklavya Sharma, GB Pant Institute, Sikkim
 16:20 – 17:00 Discussion
 19:00 Dinner hosted by Director General, ICIMOD

Day 2: April 1, 1997

Technical Session Three

09:00 – 13:00 *Eco-regional Approach to Conservation*
Chairperson : Mr. Devendra Amatya
 09:00 – 09:30 Transboundary Wildlife Trade Issues Ms Fahmeeda Hanfee, Director, TRAFFIC India
 09:30 – 09:40 Presentation by MENRIS Mr. Pradeep Mool, MENRIS, ICIMOD
 09:40 – 09:50 Remarks by Indian Representative Mr. P.K. Basnet, PCCF, Sikkim
 09:50 – 10:00 Remarks by Indian Representative Dr. R.K. Rai, New Delhi
 10:00 – 10:15 Remarks by Nepali Representative Dr. Bijaya Kattel, Deputy Director General, NPWC
 10:15 – 10:45 Tea Break
 10:45 – 11:00 Break into Groups
 Group I – Common Framework for Biodiversity Assessment and Monitoring.
 Group II – Common Framework for Sharing Conservation Benefits with the Local People
 Group III – Collaborative Arrangement for Cooperative Management of the Kanchanjunga Mountain Ecosystem
 13:00 – 14:00 Lunch
 14:00 – 16:00 Working Group Meeting Continued
 16:00 – 17:00 Presentation by Chairpersons of each working group

Technical Session Four

(10 min. of presentation and 10 min. for discussion.)

Chairperson : Prof. Pei Shengji

09:00 - 10:00 Follow-up recommendations

10:00 - 10:15 Tea Break

Concluding Session

10:15 - 10:30 Speech by the Director General, ICIMOD

10:30 - 10:40 Summing up of the Workshop, WWF Nepal

10:40 - 10:50 Speech by Dr. Eklavya Sharma

11:00 - 13:00 Site Seeing

13:00 - 14:00 Lunch at ICIMOD Guest House

14:00 Optional Trip to Godavari

Annex 3

LIST OF PARTICIPANTS

Ms. Ban Zong
Deputy Director General
Department of Forestry of the
Tibetan Autonomous Region
Lhasa, 85000, Tibet
China
FAX#086-0891-6336789

Ms. Tseden Drolgar
Project-in-Charge
QNP Management Bureau
Working Commission Office
Lhasa, 85000, Tibet
China
FAX#086-0891-6335994

Dr. R.K. Avasthe,
Sikkim Field Office
WWF India
Near Forest Secretariat
Deorali, Gangtok
India
Tel. # 91-3592-24539

Ms. Fahmeeda Hanfee
Sr. Project Officer
TRAFFIC India
WWF India
172 B, Lodi Estate
New Delhi 110 003
Fax # 91-11-4626837

Dr. R.K. Rai
J.D. In-Charge Biosphere Reserves
Ministry of Environment & Forests
Government of India
New Delhi 110 003, India
Fax: 91-11-436-1712

Mr. P.K. Basnet
PCCF and Secretary
Government of Sikkim
Forest Secretariat
Deorali, Gangtok
Sikkim

Mr. Gut Lepcha
Field Director, KNP
Government of Sikkim
Forest Secretariat
Deorali, Gangtok
Sikkim

Dr. Eklavya Sharma
GB Pant Institute of Himalayan
Environment and Development,
Sikkim Unit
Tadong, Gangtok
Sikkim, 737102, India
Fax # 0091-3592-23335

Mr. A.L. Joshi
Chief Planning Officer
Ministry of Forests and Soil Conser-
vation
Nepal

Dr. T.M. Maskey
Director General
Dept. of National Parks and Wildlife
Conservation (DNPWC)
Babar Mahal, Kathmandu
Nepal

Mr. Mani Lama
Member of Parliament
Chairman
Kanchanjunga Conservation and
Development Committee

Mr. Pradeep Regmi
District Forest Officer
District Forest Office
Taplejung, Nepal
Tel: 024-60117

Mr. Mingma Norbu Sherpa
Country Representative
WWF Nepal Programme
P.O. Box 7660
Kathmandu, Nepal

Mr. Brian Penniston
The Mountain Institute
Naxal, Kathmandu
Nepal

Mr. Devendra Amatya
Conservation Programme Director
WWF Nepal Programme
Gha 2-332, Lal Durbar
P.O. Box 7660, Kathmandu
Nepal

Mr. Dick Van Blitterswijk
DGIA Liasion Officer
SNV Nepal, Pulchowk
Kathmandu

Mr. Devendra Rana
Forests for Life Campaign
WWF-International
Avenue du Mont-Blanc
1196 Gland,
Switzerland
Fax # 41 22 364 6624

Dr. K.K. Shrestha
Central Department of Botany
Tribhuvan University
Kirtipur, Kathmandu
Nepal
Tel: 331322

Mr. Javed Hussain
Regional Forest Coordinator
WWF-Thailand
AIT Bangkok, Thailand
Fax 66-2-5246134

Mr. Narayan Poudel
Chief Ecologist
Dept. of National Park and Wildlife
Conservation (DNPWC)
Babar Mahal,
Kathmandu, Nepal

Mr. D.D. Sharma
Addl. Chief Conservator of Forests
WWF-India
Sikkim Field Office
Near Forest Dept.
Secretariat, Deorali
Gangtok, Sikkim-737102

Dr. Bijaya Kattel
Deputy Director General
Dept. of National Parks and Wildlife
Conservation (DNPWC)
Babar Mahal, Kathmandu
Nepal

ICIMOD

Mr. Egbert Pelinck
Director General

Prof. Pei Shengji
Biodiversity Specialist
Head, MNR Division

Prof. S.R. Chalise
Water Resources' Specialist

Mr. Pradeep Mool
Remote Sensing Analyst

Mr. Ajay Rastogi
Asst. Project Coordinator
MNR, ICIMOD

Ms. Sarita Joshi
Secretary, MNR

ICIMOD

Jawalakhel
P.O. Box 3226,
Kathmandu, Nepal.
Tel: 977-1-525313 / 525312 (Direct)
Fax: 977-1-524509/536747

ICIMOD

Founded out of widespread recognition of degradation of mountain environments and the increasing poverty of mountain communities, ICIMOD is concerned with the search for more effective development responses to promote the sustained well being of mountain people.

The Centre was established in 1983 and commenced professional activities in 1984. Though international in its concerns, ICIMOD focusses on the specific, complex, and practical problems of the Hindu Kush-Himalayan Region which covers all or part of eight Sovereign States.

ICiMOD serves as a multidisciplinary documentation centre on integrated mountain development; a focal point for the mobilisation, conduct, and coordination of applied and problem-solving research activities; a focal point for training on integrated mountain development, with special emphasis on the assessment of training needs and the development of relevant training materials based directly on field case studies; and a consultative centre providing expert services on mountain development and resource management.

ICIMOD WORKSHOPS

ICIMOD Workshops are attended by experts from the countries of the Region, in addition to concerned professionals and representatives of international agencies. Professional papers and research studies are presented and discussed in detail.

Workshop Reports are intended to represent the discussions and conclusions reached at the Workshop and do not necessarily reflect the views of ICIMOD or other participating institutions. Copies of the reports, as well as a Catalogue of all of ICIMOD's Publications, are available upon request from:

Documentation, Information, and Training Service (DITS)
International Centre for Integrated Mountain Development (ICIMOD)
G.P.O. Box 3226
Kathmandu, Nepal

Participating Countries of the Hindu Kush-Himalayan Region

- Afghanistan
- Bhutan
- India
- Nepal

- Bangladesh
- China
- Myanmar
- Pakistan

INTERNATIONAL CENTRE FOR INTEGRATED
MOUNTAIN DEVELOPMENT (ICIMOD)

4/80 Jawahar Street, P.O. Box 3226, Kathmandu, Nepal

Telephone: (977-1) 525313

Facsimile: (977-1) 524509, 536747

Cable: ICIMOD NEPAL

email: dits@icimod.org.np