State of the Environment

Nepal

2001

MoPE/HMG

NORAD
DIREKTORATET FOR
UTVIKLINGSHJELP
NORWEGIAN AGENCY FOR
DEVELOPMENT COOPERATION

UNEP

Nepal: State of the Environment 2001

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In collaboration with

MoPE/HMG

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Nepal: State of the Environment 2001

Foreword

Executive Director

UNEP

The Rio Earth Summit in 1992 formulated an action plan, Agenda 21: a multifaceted process to address the full range of development and environmental issues involving participation of governments, international organisations, and major groups in the quest for sustainable development.

The publication of the Global Environmental Outlook series, GEO-1, followed by GEO-2000, the Millennium Report on the Environment, involved a participatory assessment process to review the state of the world's environment and to chart a new process for global environmental policy. The diversity and magnitude of environmental problems are outlined, with a call for more complete and precise analyses of the poorly understood linkages between human actions and environmental outcomes. Although the number of policy responses is growing, low priority continues to be afforded to the environment in national and regional planning. GEO-2000 stressed the need for the development of more comprehensive and long-term mechanisms for monitoring and assessing the effects of environmental policies on environmental quality and for more integrated policy-making and action-based programmes to serve the needs of the people.

The United Nations Environment Programme (UNEP) is mandated to produce a Global State of the Environment Report in 2002 (GEO-3) for the 2002 Earth Summit, i.e., Rio + 10, and this global assessment will be enriched by producing State of Environment (SoE) reports at the national, subregional, and regional levels. In 1998, the UNEP Regional Resource Centre for Asia-Pacific (UNEP-RRCAP) collaborated with the Norwegian Agency for Development Cooperation (NORAD) to carry out a process on Strengthening National Capabilities on Environment Assessment and Monitoring towards the Preparation of the Global State of the Environment Report 2002, thus linking national to regional and global initiatives.

This National State of the Environment (SoE) Report of Nepal is the first of seven national reports from the above process, focusing on two Asia-Pacific subregions, namely South Asia (Bangladesh, Bhutan, Maldives, Nepal, and Sri Lanka) and the Greater Mekong Subregions (Laos and Vietnam). The Ministry of Population and Environment (MoPE), the national implementing agency in Nepal, has played a very crucial role in carrying out this participatory assessment process in soliciting input from various government sectoral agencies. Around 70 agencies and 150 individuals were involved in the process. With the substantive support from the International Centre for Integrated Mountain Development (ICIMOD), the designated national collaborating centre in Kathmandu, and regular feedback from the South Asia Cooperative Environment Programme (SACEP), this assessment exercise has been successful and instrumental in providing significant input to the ongoing South Asia SoE preparation. It aims at providing guidelines for environmental action planning, policy setting, and resource allocation for the coming decades, based on a sound analysis of the state of, and trends in, the nation's environment.

Five key priority issues for the environment of Nepal have been identified through a consultative process and analysed following a 'pressure-state-impact-response' (PSIR) analytical framework. The

same process will be followed by the other six countries, leading to the identification of their key environmental issues. These can then be addressed through action-based programmes in the next phase of the planning process.

The five key environmental issues identified for Nepal are forest depletion, soil degradation, solid waste management, water quality, and air pollution. The forest area is declining at an alarming rate due to high demand of fuelwood, the main source of fuel in the country, and forest clearance for land, leading to soil erosion, landslides, floods, and loss of biodiversity. Nepal's mountains and hills are inherently vulnerable to landslides and soil erosion which cause soil degradation, leading to a decline in crop production. Solid waste management problems have arisen because of the introduction of plastic materials and changing consumption patterns, especially in urban areas. Water quality, particularly in rivers and lakes near urban areas, is deteriorating due to unregulated discharge of domestic and industrial effluent, and the health of the nation's people is compromised by both inadequate waste-water treatment and insufficient supplies of potable water. Air quality, particularly in urban areas, is deteriorating due to increases in vehicular traffic and air-polluting industries, while rural inhabitants are vulnerable to respiratory diseases because of burning fuelwood in poorly ventilated houses.

This SoE assessment for Nepal provides a sound basis for the development of action plans, the next stage of the planning process, as we enter the new millenium. The report aims to provide concrete guidance for action planning, policy setting, and resource allocation for the coming decades to improve the state of the environment of Nepal and the welfare of her people.

UNEP will continue to provide leadership in the region for the preparation of environmental assessment reports at national, subregional, and regional level and the capacity building necessary to support these assessment activities.

Klaus Töpfer
Under-Secretary General, United Nations and
Executive Director, United Nations Environment Programme
26 March 2001

Foreword

Former Secretary Ministry of Population and Environment, Nepal

Nepal is rich in various natural resources. Harnessing these resources can prove to be instrumental for the country's development. However, exploitation of these resources has to be carried out in a way that does not destroy the environment of the country. Thus, sustainable development and preservation of the natural environment have become challenges for today's Nepal.

Meeting such challenges requires evaluation and assessment of the status of the environment on a regular basis. A sound legal framework for management of the environment is equally important. There is no strong database on all aspects of the environment and natural resources and, as a result, no assessment and evaluation of the status of the environment could be carried out in a systematic and scientific manner. This report endeavours to close these gaps.

In May 1999 an agreement was formally signed between the United Nations Environment Programme/Environment Assessment Programme – Asia and Pacific (UNEP/EAP-AP, Bangkok)/South Asia Cooperative Environment Programme (SACEP-Colombo), and the Ministry of Population and Environment, His Majesty's Government of Nepal (MoPE – Nepal)/International Centre for Integrated Mountain Development (ICIMOD) for implementation of the project on 'Strengthening Environment Assessment and Monitoring Capabilities in Nepal – State of Environment Report'. The project aimed to augment the capacity of His Majesty's Government of Nepal to make accurate environmental assessments, improve decision-making for sustainable development, and establish a strong information network with a uniform data format.

This **Nepal: State of the Environment Report 2001**, highlighting the five key environmental priorities of Nepal (forest, soil, solid waste, water, and air) has been prepared at an appropriate time. These priority issues are genuine and very relevant to the present day context of environmental development in Nepal.

This report, prepared with the generous financial support of the United Nations Environment Programme (UNEP) and the Norwegian Agency for Cooperation and Development (NORAD), will serve as a valuable input and will help planners, policy-makers, and decision-makers to develop plans and formulate policies for the sustainable development of natural resources in Nepal without compromising the environment.

The Ministry is grateful to Mr. Surendra Shrestha, Director of UNEP-EAP, for bringing this project to Nepal. It extends its thanks to Dr. Gabriel Campbell, Director General, Dr. Binayak Bhadra, Director of Programmes, and Mr. Pramod Pradhan, former Head of ICIMOD-MENRIS, as well as Dr. Bandana Kayastha Pradhan, national consultant-SEAMCAP project, for their sincere endeavours in the successful implementation of this project and timely completion of the report. The contributions of Mr. Basanta Shrestha, the Acting Head of the MENRIS Division of ICIMOD, and Ms. Bidya Banmali towards completion of the project are also duly recognised. Appreciation is also given to Mr. Janak R. Joshi,

Joint Secretary, Mr. P. Kunwar, Under Secretary, and Mr. B. K. Uprety, Ecologist of this Ministry for their contributions towards the successful completion of this project. Last, but not least, the work of all those who have given their support to the project is also sincerely acknowledged.

Dr. Govind Raj Bhatta
Former Secretary
Ministry of Population and Environment
Kathmandu
March 2001

Foreword

Director General

ICIMOD

The environment of Nepal and the Hindu Kush-Himalayan (HKH) Region, in which it holds a place of pride, is renowned for its beauty and benefits. The divine snow and forest-clad mountains attract pilgrims and tourists alike. The rivers provide power and water for hundreds of millions downstream.

But all is not well with Nepal's mountain environment. The towering ridges are holding in a brown cloud of pollution over South Asia. Many forest areas are disappearing. Water is becoming increasingly polluted. In short, this beautiful mountain environment is in danger – but to what extent and from exactly what sources? What is the real state of the environment in Nepal? This is the question addressed in this report.

A fundamental problem in determining the state of the environment and natural resources of Nepal and the countries in the Hindu Kush-Himalayan (HKH) region is that available data are scanty and scattered. The lack of adequate and aggregate data makes it difficult to evaluate the status of the environment of individual countries, let alone of the region as a whole. Poor data also make it difficult to build a sound legal foundation and support wise decision-making for sustainable development and conservation of the environment.

The types of environmental problems and their magnitude vary considerably among the countries in the HKH region. This report, entitled **Nepal: State of the Environment 2001**, profiles the key mountain environment issues of Nepal: forest, soil, solid waste, water, and air. It is anticipated that the information contained in this report will not only help to design policies and programmes for the environmental conservation of Nepal but will also provide a framework for environmental management that can be used as a guideline for other HKH countries.

The immediate objective of this project – Strengthening Environmental Assessment and Monitoring Capabilities in South Asia and the Greater Mekong Sub Region (SEAMCAP) – was to contribute to the preparation of the Nepal report, which will also feed into the preparation of the Decadal 2002 Global State of Environment Report. The goals of the project were to strengthen capacity and assist the government in establishing a strong information technology base for data processing, modelling, and analysis requirements to support assessment and reporting and to improve the basis for addressing important, emerging environmental problems.

The Ministry of Population and Environment (MoPE) was the national focal point for this project. ICIMOD has served as the collaborating and facilitating centre for completing this project and associated activities. It extends its gratitude to the MoPE and other government agencies for their cooperation in the successful completion of this project report. The project was also assisted by the United Nations Environment Programme (UNEP), the South Asia Cooperative Environment Programme (SACEP), and the Norwegian Agency for Cooperation and Development (NORAD).

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ICIMOD is particularly grateful to Mr. Surendra Shrestha, Director of UNEP-EPA/ AP, for his initiative and guiding hand in developing and carrying this project forward. Mr. Varun P. Shrestha, Former Secretary of MoPE, and Dr. Madhav Ghimire, Former Joint-Secretary of MoPE, are thanked for their role in bringing the project to ICIMOD. The project report is enriched by the comments and suggestions of Dr. Ananda Raj Joshi and Mr. Pradyumna K. Kotta of SACEP, and Mr. Choudhury R. C. Mohanty and Mr. Purna C. L. Rajbhandari of UNEP/EAP-AP. Finally, ICIMOD expresses its thanks to all contributors and reviewers representing various organisations in Kathmandu, Nepal, as well as the core group of participants at the SEAMCAP Meeting and its staff members who were involved in this project.

I am hopeful that the efforts of all these committed people will provide a richer, more accurate information base for conserving the endangered environment of Nepal and the mountains of the HKH and allow Nepal to participate effectively in the global environment agenda.

J. Gabriel Campbell

Director General

International Centre for Integrated Mountain Development

Kathmandu

March 2001

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Acronyms and Abbreviations

ADB	Asian Development Bank
AEPC	Alternative Energy Promotion Centre
AIC	Agricultural Inputs Corporation
AIT	Asian Institute of Technology
APP	Agricultural Prospective Plan
APROSC	Agricultural Projects Services Centre
ARI	acute respiratory infection
ASD	Agricultural Statistics Division
BHC	benzene hexachloride
BOD	biological oxygen demand
BOD ₅	biological oxygen demand (5 days)
BPP	Biodiversity Profile Project
CBO	community-based organisation
CBS	Central Bureau of Statistics
CDG	Central Department of Geography
CDR	Central Development Region
CEDA	Centre for Economic Development and Administration
CFC-12	chlorofluorocarbon
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	chemical oxygen demand
DDC	district development committee
DFI	district forest inventory
DFRS	Department of Forest Research and Survey
DHM	Department of Hydrology and Meteorology
DHS	Department of Health Services
DMG	Department of Mines and Geology
DNPWC	Department of National Parks and Wildlife Conservation
DISCO	District Soil Conservation Office
DO	dissolved oxygen
DoA	Department of Agriculture
DoC	Department of Customs
DoF	Department of Forests
DoF	Department of Finance
DoHS	Department of Health Services
DoI	Department of Irrigation

DoR	Department of Roads
DPR	Department of Plant Resources
DPTC	Disaster Prevention Technical Centre
DSCWM	Department of Soil Conservation and Watershed Management

ECOS	Environmental Conservation through Education and Research
EDR	Eastern Development Region
EIA	environmental impact assessment
ENPHO	Environment and Public Health Organisation
ESPS	Environment Sector Programme Support
EPA	Environmental Protection Act
EPC	Environmental Protection Council
EPR	Environmental Protection Rule
EURO-1	European Standard One

FINNIDA	Finnish International Development Agency
FSD	Forest Survey Division

GDP	gross domestic product
GEO	Global Environment Outlook
GHG	greenhouse gas
GIS	geographic information systems
GLOF	glacial lake outburst flood
GTZ	German Agency for Technical Co-operation
GWRDP	Groundwater Resource Development Project

HC	hydrocarbon
HCFC	hydro-chlorofluorocarbon
HMG	His Majesty's Government
HMGN	His Majesty's Government of Nepal
HOPE	Hidden Opportunities for Productivity and Environment
HSD	high speed diesel
HSU	Hartridge smoke unit
HVS	high volume sampler

ICS	improved cooking stove
ICIMOD	International Centre for Integrated Mountain Development
IEC	information, education, and communication
INGO	international government organisation
IPCC	Intergovernmental Panel on Climate Change
ITTA	International Tropical Timber Agreement
IUCN	International Union for Conservation of Nature

JEC	Japan Environment Corporation
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KMC	Kathmandu Metropolitan City
KVVECP	Kathmandu Valley Vehicular Emission Control Programme
LEADERS	Legal and Environmental Analysis and Development Research

LPG	liquefied petroleum gas
LRMP	Land Resources Mapping Project

LRTI	lower respiratory tract infection
LWK	live weight of killed animal
MENRIS	Mountain Environment and Natural Resources Information System
MFSC	Ministry of Forest and Soil Conservation
MHPP	Ministry of Housing and Physical Planning
MLD	Ministry of Local Development
MNR	Mountain Natural Resources
MoA	Ministry of Agriculture
MoE	Ministry of Education
MoF	Ministry of Finance
MoH	Ministry of Health
MoHA	Ministry of Home Affairs
MoI	Ministry of Industry
MoPE	Ministry of Population and Environment
MoWR	Ministry of Water Resources
MPFS	Master Plan for the Forestry Sector
MUAN	Municipal Association of Nepal
MWDR	Mid-Western Development Region
NAA	Nepal Agricultural Association
NARC	Nepal Agricultural Research Council
NARMSAP	Natural Resource Management Sector Assistance Programme
NBSM	Nepal Bureau of Standards and Metrology
NEA	Nepal Electricity Authority
NECG	Nepal Environment Conservation Group
NEPAP	Nepal Environmental Policy and Action Plan
NESS	Nepal Environmental and Scientific Services
NFI	National Forest Inventory
NGO	non-government organisation
NHDR	Nepal Human Development Report
NOC	Nepal Oil Corporation
NORAD	Norwegian Agency for Cooperation and Development
NPC	National Planning Commission
NSIC	Nepal Standard of Industrial Classification
NTFP	non-timber forest product
NTU	nephelometer turbidity unit
NVMES	Nepal Vehicular Mass Emission Standard
NWSC	Nepal Water Supply Corporation
ODS	ozone depleting substance
OPD	outpatients department
PAH	poly aromatic hydrocarbon
PARDYP	People and Resource Dynamics in Mountain Watersheds of the Hindu Kush-Himalayas
RWSSP	Rural Water Supply and Sewerage Project
SACEP	South Asia Co-operative Environment Programme
SEAMCAP	Strengthening Environmental Assessment and Monitoring Capabilities in South Asia and the Greater Mekong

SEI	Stockholm Environment Institute
SEI	significant environmental issues
SIDA	Swedish International Co-operative Development Agency
SoE	State of the Environment
SWMRMC	Solid Waste Management and Resource Mobilisation Centre
TDFB	Town Development Fund Board
TDN	total digestible nutrients
TDS	total dissolved solid
TFR	total fertility rate
TPC	Trade Promotion Centre
TSP	total suspended particulates
TSS	total suspended solids
TU	Tribhuvan University (Kathmandu)
UBC	University of British Columbia
UDLE	Urban Development Through Local Efforts
UNDP	United Nations Development Programme
UNEP/EAP-AP	United Nations Environment Programme/Environmental Assessment Programme for Asia and the Pacific
UNICEF	United Nations Children's Fund
URBAIR	Urban Air Quality Management Strategy in Asia
URTI	upper respiratory tract infection
USEPA	United States Environmental Protection Agency
VDC	village development committee
VOC	volatile organic matter
WDR	Western Development Region
WECS	Water and Energy Commission Secretariat
WHO	World Health Organisation

Symbols and Units

Exchange (buying) rate for 1 US dollar (average for the year)

Year

1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

Nepali rupees (NRs)

27.4 29.1 42.7 42.6 49 49.1 50.5 56.3 56.8 62.5 68.2 70.5

Symbol (Chemical)

As	arsenic
C	carbon
CH ₄	methane
Cl ⁻	chloride ion
CO	carbon monoxide
CO ₂	carbon dioxide
O ₂	oxygen (gas)
O ₃	ozone
N	nitrogen
NO ₂	nitrogen dioxide
NO _x	oxides of nitrogen
P	phosphorus
Pb	lead
S	sulphur
SO ₂	sulphur dioxide
SO _x	sulphur oxide

Units and Symbols

cm	centimetre
db	decibel
g	gram
Gj	gigajoule
h	hour
kg	kilogramme
kgoe	kilogramme oil equivalent
km	kilometre
kj	kilojoule

l	litre
lcd	litre consumption per day
m	metre
masl	metres above sea level
ml	millilitre
mld	million litres per day
m ³	cubic metres
mg	milligram
µg	microgram
pH	hydrogen-ion concentration
ppm	parts per million
PM-10	particulate matter ≤10 µm diameter
toe	tonnes of oil equivalent

UNDP	United Nations Development Programme
UNEP/EAP-AP	United Nations Environment Programme/Environmental Programme for Asia and the Pacific
UNICEF	United Nations Children's Fund
URBAIR	Urban Air Quality Management Strategy in Asia
URTI	upper respiratory tract infection
USEPA	United States Environmental Protection Agency
VDC	village development committee
VOC	volatile organic matter
WDR	Western Development Region
WECS	Water and Energy Commission Secretariat
WHO	World Health Organisation

Units and Symbols

Ar	arsenic
C	carbon
CH ₄	methane
Cl ⁻	chloride ion
CO	carbon monoxide
CO ₂	carbon dioxide
O ₂	oxygen (gas)
O ₃	ozone
N	nitrogen
NO	nitrogen dioxide
NO _x	oxides of nitrogen
P	phosphorus
Pb	lead
S	sulphur
SO ₂	sulphur dioxide
SO _x	sulphur oxide

Units and Symbols

cm	centimetre
db	decibel
g	gram
GJ	gigajoule
h	hour
kg	kilogramme
kgoe	kilogramme oil equivalent
km	kilometre
MJ	megajoule

Notes

Exchange rate

Values in Nepalese rupees have been converted to US\$ at the exchange rates shown

Exchange (buying) rate for 1 US dollar (average for the year)

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Nepali rupees (NRs)	27.4	29.1	42.7	42.6	49	49.1	50.5	56.3	56.8	67.6	68.2	70.5

Dates

Annual data for Nepal are sometimes collected according to the Gregorian calendar (January to December) but often according to the Nepali calendar (Bikram Sambat, which runs from approximately 15th April to 14 April the following year). In the latter case, year dates are given in the form 1978/79 and so on.

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Back Pocket

Transparent pullout sheet, outline map of Nepal with district names and boundaries, to use as an overlay with maps