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Preface

Environment is a multi-disciplinary topics directly related to the nature, human being and their activities. Concerns have been growing widely about changing environment and its impact upon the lives of the earth. In fact, areas of most researchers and efforts of most scientists are being concentrated towards environment in one way or the other. Accordingly, priority of the Government of Nepal has also been focused towards environment, be that in the name of "the Climate Change" or "Conservation" or " the quality of life of the people". Therefore, Central Bureau of Statistics (CBS), in the context of the increasing demand for environment related data, has been attempting to bring out special publication since decades and the present edition "Environment Statistics of Nepal 2013" is the eighths in the series.

This is an update to the previous edition and has compiled data based on the classification of the United Nations Framework for the Development of Environment Statistics 1995 (UN FDES,1995) covering topics on economic issues, social and demographic issues, air and climate, land and soil, water, other natural resources, waste, human settlements and natural disasters. I hope that this edition will be useful to planners, policy makers and other users as well.

I would like to express my gratitude to the government and non-government agencies for providing valuable data and supports to bring out this publication in its present form.

I heartily thank to Mr. Suman Raj Aryal and Dr. Rudra Suwal, Deputy Director Generals of the bureau for their overall guidance to bring out this publication. Mr. Sushil Kumar Sharma, Director, Environment Statistics Section deserves special thanks for shouldering the responsibility to accomplish the whole tasks of the compilation and bringing out this publication in time. Statistical Officers Mr. Manohar Ghimire and Mr. Tulsi Prasad Paudel are also thankful for their sincere involvement in the compilation of this publication. Similarly, I would like to thank Director Mr.Mahesh Chand Pradhan, Statistical Officers Ms. Ranju Khadka and Mr.Damodar Shrestha and Statistical Assistant Mr. Govinda Dumre for their contributions in this publication.

Finally, I would like to request all users to provide invaluable suggestions and comments that would be useful for further improvement in the future publications of this kinds.

June, 2014
Kathmandu, Nepal

Bikash Bista
Director General
Central Bureau of Statistics

Acronyms and Abbreviations

ARI	Acute respiratory Tract infection
As	Arsenic
BHC	Boron hydrogen carob
BOD	Biological oxygen demand
Bq	Becquerel
Ca	Calcium
CBS	Central Bureau of Statistics
Cd	Cadmium
CDD	Control of diarrhea diseases
CFC	Chlorofluorocarbons
cfu	Coliform
CFUG	Community Forest User Group
CH_4	Methane
CITES	Convention on International Trade in Endangered Species of World Fauna and Flora
CO	Carbon monoxide
CO_2	Carbon dioxide
COD	Chemical oxygen demand
COFOG	Classification of Functions of Government
COICOP	Classification of Individual Consumption by Purpose
COPNI	Classification of the Purposes of Non-Profit Institutions
CPC	Central Product Classifications
dBA	Decibel A
DDT	Dichloro diethene tricloroethen
DHM	Department of Hydrology Meteorology
DO	Dissolved oxygen
DMG	Department of Mines and Geology
DWSS	Department of Water Supply and Sewage
DWIDP	Departmenty of Water Induced Disaster Prevention
EIA	Environmental Impact Assessment
FISIM	Financial Intermediation Services Indirectly Measured
ft^3	Cubic feet
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNDI	Gross National Disposable Income
GNI	Gross National Income
Ha	Hectare
HC	Hydrocarbon
HHs	Households
HIV	Human immunodeficiency virus
Hr	Hour

HSU	Hatridge smoke unit
HVAS	High volume air sampler
ICIMOD	International Centre for Integrated Mountain Development
IPCC	Intergovernmental Panel on Climate Change
ISIC	International Standard Industrial Classifications
ITTA	International Tropical Timber Agreement
IUCN	The World Conservation Union (International Union for the Conservation of Nature and Natural Resources)
K_2O	Potassium oxide
kg	Kilogram
KL	Kiloliter
Km	Kilometer
Km^2	Square kilometer
KUKL	Kathmandu Upatyaka Khanepani Limited
KWh	Kilowatt hour
L	Liter
L/d/p	Liter / day / person
lcd	Liter consumption/day
LD	Laser dust
L_{dn}	Level day-night
L_{eq}	Equivalent sound presser level
LPG	Liquefied petroleum gas
LRMP	Land Resource and Mapping Project
Lt/min	Liter per minute
m	Meter
M	Million
M^2.	Square meter
M^3	Cubic meter
m^3/ min	Cubic meter per minute
m^3/yr	Cubic meter per year
MB	Multi-bacilli
mb	Mill bar
MDGs	Millennium Development Goals
MDT	Multi-drug therapy
mg/l	Milligram per liter
mg/m^3	Milligrams per cubic meter
ml	Local magnitude / milliliter
mld	Million liter/day
mm	Millimeter
mrem/hr	Milli radiation equivalent to man/hour
mt.	Metric ton
mtO	Mineral trepanation oil
N	Nitrogen
NA	Not Available

Na	Sodium
NARC	Nepal Agriculture Research Council
NAST	Nepal Academy of Science and Technology.
NDHSs	Nepal Demographic and Health Surveys
NLSS	Nepal living standards survey
NO_2	Nitrogen dioxide
NP	National Parks
NSIC	Nepal Standard Industrial Classifications
NTU	Nephelometer turbidity unit
NWSC	Nepal Water Supply Corporation
O_3	Ozone
ºC	Degree Celsius
ODS	Ozone depleting substance
P_2O_5	Phosphorus pentaoxide
pb	Lead
pH	Hydrogen-in concentration
PM_{10}	Particulate matter less than 10 microgram (0.07 g/m3)
PO_3	Phosphate
ppb	Parts per billion
ppm	Parts per million
ppt	Parts per trillion
RETs	Renewable Energy Technologies
SAE	Small Area Estimation
SEEA	Integrated Environmental and Economic Accounting
SO_2	Sulphur dioxide
SO_4	Sulphate
SO_x	Oxides of Sulphur
SPM	Suspended Particulate Matter
STD	Sexually Transmitted Diseases
TCU	True color unit
TDS	Total Dissolved Solids
TOE	Tones of Oil Equivalent
TSP	Total suspended particulates
TSS	Total Suspended Solids
TYIP	Three Year Interim Plan
UNEP	United Nations Environment Programme
UNFDES	United Nations Framework for the Development of Environment Statistics
UV	Ultra Violet
WECS	Water and Energy Commission Secretariat
WHO	World Health Organization
WP	Watt Power
WW	Waste Water
µe's	Micro- environments
µg/m^3	Microgram per cubic meter

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Chapter I
Introduction

Introduction

Background

Environment can be defined as the physical surrounding of people of which they are a part and on which they are dependant for their activities like physiological functioning, production and consumption. The physical environment extends from air, water and land to natural resources like energy carriers, soil and plants, animals and ecosystems. The availability and use of natural resources have a bearing on the outcome and the pace of development process. For an urbanized society, a large part of environment is human made. There is always linkage between artificial environment and natural environment. Commonly, the term 'Environment' is restricted to ambient environment. In that view, the indoor environment (home, workplace) is regarded as an isolated piece of environment, to be treated on its own terms.

Environment problems such as global warming, melting of snow in the Himalayas, decreasing productivity in agriculture despite technology development etc. do not confine to any country or continent nor it is limited to the developing or the developed world. Therefore, United Nations and other global institutions have been paying attention towards environment management since decades. It has been realized that sustainability of the development depends much upon the management of the environment and hence, the expenditure on environmental management today is in fact, a reliable investment for the safe future.

United Nations initiated actions towards the environment by establishing United Nations Environment Programme (UNEP) in 1972 that aims to coordinate the development of environmental policy by keeping the global environment under review and bringing emerging issues to the attention of the governments and the international community for action.

Environment Statistics and Indicators

Environment statistics describe human activities with a view to enumerate his/her interactions with the environment. The scope of environment statistics depends largely on the environmental problems on the political agenda; the geographic situation of a country, its state of development, and its political system taken together determine the bulk of this agenda. A tropical, densely populated country with much rain and situated on the coast envisages other problems than a sparsely populated landlocked country with a desert climate. Also, problems of sustainable agriculture and forestry, of eco-tourism, or of biodiversity conservation or of climate change are likely to be much more important to the biodiversity-rich, resource-dependent economies of the developing world. The scope generally includes the media of the natural environment (air/climate, water, land/soil), the biota found within these media, and human settlements. It therefore, describe the quality and availability of natural resources, human activities and natural events that effect the environment, the impacts of these activities and events and social responses to these impacts.

Environment Statistics is relatively young branch and multi-disciplinary area in the field of official statistics. The sources of environmental statistics are dispersed and variety of methods is applied in their compilation. They generally provide a synthesis of data from various subject areas and sources to help in the formulation and evaluation of integrated socio-economic and environmental policies.

Development activities now have been linked to the environmental management and accordingly, the demand for environment related information has also increased day-by-day. Therefore, efforts are being made for the development of environment statistics. The United Nations Statistical Division (UNSD) developed United Nations Framework for the Development of Environment Statistics (UNFDES) (a list of environmental indicators) in collaboration with the Inter-governmental Working Group on the Advancement of Environment Statistics. The fourth meeting of the Working Group (Stockholm, 6 - 10 February 1995) agreed on the List of environmental and related socioeconomic indicators given below. It provides framework for the member countries to compile and manage environmental statistics. The Statistical Commission, at its twenty-eighth session (New York, 27 February - 3 March 1995), approved this list for international compilation by UNSD. The indicators that are bolded in the list were intended for short-term compilation directly from national statistical services or from other international organizations or specialized agencies.

Framework for Development of Environment Statistics (FDES) Information categories				
Agenda 21 Issues (clusters)	**A. Socioeconomic activities, events** (pressure /driving force)	**B. Impacts and Effects events** (part of state)	**C. Responses to impacts events** (response)	**D. Inventories, stocks, background conditions events** (part of state)
ECONOMIC ISSUES	Real GDP per capita growth rate Production and consumption patterns Investment share in GDP	EDP/EVA per capita Capital accumulation (environmentally adjusted)	Environmental protection expenditure as % of GDP Environmental taxes and subsidies as % of government revenue	Produced capital stock
SOCIAL/DEMO-GRAPHIC ISSUES	Population growth rate Population density Urban/rural migration rate Calorie supply per capita	% of urban population exposed to concentrations of SO2, particulates, ozone, CO and Pb Infant mortality Rate Incidence of environmentally related diseases		Population living in absolute poverty Adult literacy rate Combined primary and secondary school enrollment ratio Life expectancy at birth Females per 100 males in secondary school
AIR/CLIMATE	Emissions of CO2, SO2 and NOx Consumption of ozone depleting substances	Ambient concentrations of CO, SO2, NOx O3 and TSP in urban areas Air quality index	Expenditure on air pollution abatement Reduction in consumption of substances and emissions	Weather and climate conditions
LAND/SOIL	Land use change Livestock per km2 of arid and semi-arid lands Use of fertilizers Use of agricultural pesticides	Area affected by soil erosion Land affected by desertification Area affected by Stalinization and water logging	Protected area as % of total land area	Arable land per capita
WATER Fresh water resources	Industrial, agricultural and municipal discharges directly into freshwater bodies Annual withdrawals of ground and surface water Domestic consumption of water per capita Industrial, agricultural water use per GDP	Concentration of lead, cadmium, mercury and pesticides in fresh water bodies Acidification of fresh water bodies BOD and COD in fresh water bodies Water quality index by fresh water bodies	Waste water treatment, total and by type of treatment (% of population served) Access to safe drinking water (% of population served)	Groundwater reserves
Marine water resources	Industrial, agricultural and municipal discharges directly into marine water bodies	Deviation in stock from maximum sustainable yield of marine species Loading of N and P in		

		coastal waters		
OTHER NATURAL RESOURCES				
Biological resources	Annual round wood production Fuel wood consumption per capita Catches of marine species	Deforestation rate Threatened, extinct species	Reforestation rate Protected forest area as % of total land area	Forest Inventory Ecosystems inventory Fauna and flora inventory Fish stocks
Mineral (including energy) resources	Annual energy consumption per capita Extraction of other mineral resources	Depletion of mineral resources (% of proven reserves) Lifetime of proven reserves		Proven mineral reserves Proven energy reserves
WASTE	Municipal waste disposal Generation of hazardous waste Imports and exports of hazardous wastes	Area of land contaminated by toxic waste	Expenditure on waste collection and treatment Waste recycling	
HUMAN SETTLEMENTS	Rate of growth of urban population % of population in urban areas Motor vehicles in use per 1000 habitants	Area and population in marginal settlements Shelter index % of population with sanitary services	Expenditure on low-cost housing	Stock of shelter and infrastructure
NATURAL DISASTERS	Frequency of natural disasters	Cost and number of injuries and fatalities related to natural disasters	Expenditure on disaster prevention and mitigation	Human settlements vulnerable to natural disasters

The above FDES helps in the development, coordination and organization of environment statistics. FDES is generally utilized for reviewing environment problems, identifying variables for statistical descriptions of the quantifiable aspects of environment issues, assessing data requirements, sources and availability and structuring databases on environmental aspects. Censuses, surveys, the use of administrative records and monitoring networks are the methods of data collection for environmental subject areas.

Policy makers, administrators and development workers are not only users of environment statistics. Further the demand for data environmental aspects arises from business, industry, scientific research institutes, the mass communication media, and the general public and international organizations. International organizations, in particular, require comparable data to assess global environmental issues.

Environment Management in Periodic Plans

In the context of Nepal, policies and programs on environment management have been incorporated in the periodic plans. However, priorities varied and immediate needs are reflected in the plans. Issues relating to Environment have been addressed since the sixth five years periodic plans. Policy regarding the environmental subjects has been reflected in national, international treaties or general conventions. It has become essential to incorporate those policies followed and continued in the development plans and programs realizing the problems of climate change and environmental degradation.

In early seventies, priorities were given to address soil erosion, flood and landslides and conserve forest resources in the policies, strategies and programs of the periodic plans. In early eighties, emphasis was given on the policy of reducing water pollution generated by industries and urban areas. At the same time, efforts were made to manage resources through people's participation. Remarkable achievements were gained in community forestry but problems began to emerge in urban areas and industrial estates particularly of pollution of solid waste, air, water and noise. On

the other hand, rural areas continue to suffer from soil erosion, flood, landslides and reduction in the sources of water. Nevertheless, various initiatives were taken by the government, Non-Governmental Organizations (NGOs), and private sector to address these problems. The government formulated policies and enacted Acts and regulations such as Environment Protection Act, 1996, Environment Protection Rules, 1997 and Ozone Depleting Substances Consumption Rules, 2001 etc. Environment Impact Assessment (EIA) of development works was institutionalized and standards related to the industrial effluents air quality were implemented. But, the outcome of these efforts was not achieved satisfactorily.

Nepal has been facing two types of environmental challenges, problems generated by the pressure on natural resources and air as well as water pollution, and the problems generated by climate change for which the country is not responsible but has to face it and it could even be dangerous in future. The Three Year Interim Plan (TYP) of Nepal (20010/11 - 2012/13) has mentioned the major problems of environment management such as monitoring system being not effective regarding the implementation of approved standard including as mentioned in the report on EIA, institutional capacity not strengthened as expected, coordination mechanism not strengthened amongst the inter ministries, and environment related policies and programs not adaptable with sectoral policies and programs.

In pursuing national development, an approach paper to the TYP (FY 2013/14 – 2015/16) aims to Nepal increasingly needs to keep in mind the goals of environmental protection and adaptation to climate change. Nepal has ratified several national and international treaties and conventions regarding these issues and has arranged for the corresponding national policies and legislative and institutional infrastructure to uphold its commitments. To minimise stress on the environment and to mitigate the impacts of climate change, Nepal has adopted the notion of green development. With the participation of the Nepal and other governments and national as well as international non-government agencies, efforts have been made to frame strategic programmes to promote national and local adaption, initiate carbon trading, and internalize and address environment-sensitive issues. The lack of institutional capacity, the absence of inter-agency relationships to handle issues relating to climate change, and the shortage of adequate means and resources are some of the problems faced by this sector. An approach paper to the TYP (FY 2013/14 – 2015/16) has mentioned the following major policies and operating policies to be adopted in the environment sector.

- To make environmental management an integral component of development programmes.
- To adapt climate change and sustainably conserve and manage natural resources by pursuing disaster risk mitigation, poverty alleviation and environmental protection
- To make meteorological services reliable, trustworthy, regular and good-quality in order to mobilize them in efforts to mitigate the impacts of climate change.
- To make new laws pertaining to environmental conservation will be drafted, and the environmental policy, existing laws, rules and mechanisms will be strengthened and updated and institutional capacities will be enhanced
- Through the Local Adaption Programme of Action, the National Adaption Programme of Action will be executed at the local level and efforts to alleviate poverty will be expanded.
- To make Programmes for spreading public awareness about protecting and preserving the environment will be carried out
- The Ministry of Science, Technology and Environment will serve as a focal agency to coordinate all the activities related to environmental conservation and climate change
- By enforcing the treaties and conventions to which Nepal is a party, and especially taking advantage of the Clean Development Mechanism under the Kyoto Protocol, the agencies concerned will be mobilized to derive maximum benefits
- Partnerships will be forged among the donor agencies, non-government organizations, local bodies, community institutions and other agencies in order to coordinate activities related to environment and climate change
- The development of environment-friendly, climate change-adaptive infrastructure will be emphasized. Inter-agency coordination in the planning and implementation of environment-friendly development measures will be strengthened.
- The concept of green economy will be integrated into all economic programmes.
- Pollution levels in the rivers in Kathmandu and other metropolises will be reduced and air, land, water, and sound pollution will be controlled.
- Actions regarding hazardous waste management will be taken in coordination with the agencies concerned.
- Additional environmental standards will be framed and implemented in the areas of air, land, water, and sound pollution
- Special programs for reducing various types of pollution will be designed and implemented in order to keep urban pollution within a certain limit and to preserve the beauty of rural areas.

- Mechanisms for the enforcement of 'the polluter pays' and 'removing pollution is good' principles will be developed and implemented; the use of low-polluting means of transport and environment-friendly fuel will be promoted.
- Advanced technology will be employed to minimize the growing levels of pollution.
- To reconcile the sometimes conflicting demands of environmental protection and poverty alleviation, poverty alleviation programmes with an environmental dimension will be effectively implemented.
- The existing weather forecasting system will be made more reliable and trustworthy.
- Early warning systems for floods will be initiated by utilizing appropriate technology.
- To improve the collection of data from the currently existing water-and-weather centres, a telemetry system will be developed and expanded,
- Provisions will be made for spending a certain portion of revenue generated from natural resources for the conservation of natural resources and environmental research and development.

Millennium Development Goals and Progress Status in Achieving the Environment Sustainability Goals in Nepal

Nepal has made significant progress in achieving its MDGs. In fact, given the difficult context— a decade-long armed conflict, political instability, and unfinished national political agenda regarding peace-building, constitution- writing and state-restructuring— its achievements should be considered remarkable. Its targets for poverty and hunger, universal primary education, gender equality and women's empowerment, child mortality, and maternal health are likely to be achieved, while those for HIV/AIDs, malaria and other diseases, environmental sustainability, and global partnership are unlikely to be achieved in totality.

Environmental sustainability is not being addressed adequately, and will require much more effort and resources to achieve targets. Environment sustainability is directly related with the people's livelihoods and economic development. Nepal is highly vulnerable to the risks of climate change, although its contribution to green house gas (GHG) emissions is very low and negligible role in global warming. Community based initiatives are essential for effective conservation and sustainable use of forests and biodiversity and for biodiversity loss. As the climate change became an international issue, environmental protection and conservation has gained more attention in Nepal. Government of Nepal has given importance to poverty alleviation, food security and climate change by creating the employment opportunities through its three years' periodic plans/programs.

After climate change became an international priority, Meeting the needs of a growing population for sustainable energy is one of the biggest challenges facing Nepal, especially in light of the need to reduce poverty and address climate change. Nepal must adopt improved and affordable energy-efficient technology if it is to reduce poverty and sustain prosperity. Its demand for energy should be increasingly met by renewable sources in order to limit the adverse impact on the environment. It should replace out-dated infrastructure and technologies gradually and invest in efficient energy usage, renewable energy sources, and minimally carbon-intensive technologies; all areas of investment which promise both financial and environmental benefits. The government is committed to phasing out inefficient fossil fuel subsidies. In embracing renewable-energy technology, it should provide targeted support, perhaps in the nature of subsidies, to poor and marginalized communities and rural areas. Providing people with access to modern and reliable energy to cook and light their homes has enormous social, economic, and environmental benefits. The government can use a combination of taxation, subsidy, regulation and partnership to encourage innovations in clean energy. Although access to safe drinking water is a basic human right, many Nepalese have access to only basic, not medium- or high quality water supply services, and continuous access is rarely guaranteed. The 2015 MDG targets focus on improving the quality of the sources of water collection and on reducing the amount of time spent collecting water. Nepal must now ensure that safe drinking water is universally accessible nearby, or at, schools and homes, especially those located in slums and squatter settlements, and that tourists, too, are adequately provisioned. Investments in safe drinking water should complement investments in sanitation and hygiene so that Nepal can reduce the currently high incidence of diarrheal diseases. The nation must expand sanitation infrastructure and offer more public services as well as establish, or strengthen, national, sub-national and local policies regarding the collection, recycling and usage of wastewater.

Monitoring and evaluation of the policies and programs are keys to the successful implementation of the plan. However, proper monitoring and evaluation has been difficult due to data and information gaps.

Development of Environment Statistics in Nepal

The need of statistics on environmental aspects has been realized particularly after 1970s. Formerly, problems of environment were not so acute as today. Policy makers, planners, development workers felt the need of new dimension of official statistics namely environment statistics for the sustainable development of the country.

The development of Environment Statistics is still at infancy stage in Nepal. It is a new area in the Statistical System of Nepal. Central Bureau of Statistics (CBS) first published a compendium on Environment Statistics in 1994 which provided valuable insights into the importance and usefulness of the subject matter. 'A Compendium on Environment Statistics 1998 Nepal' was brought as second publication with an attempt to analyze available data on various aspect of the environment of Nepal. However, database on the environment was limited. Therefore, CBS continued attempts to bring out the environment related statistics by compiling and publishing its publication 'Environment Statistics of Nepal, 2001' in the form of environment database of Nepal. The present issue of 'Environment Statistics of Nepal, 2013' is the eighth in the series.

The present issue has been organized with data on various aspects of the Nepalese environment as follows:
Chapter I outlines introductory remarks on environmental statistics and policy focus.

Chapter II of the book contains statistical tables related to economic issues. Macro-economic indicators are presented in tables particularly, GDP by industrial sectors, GDP growth rates, production and consumption patterns. Also, estimates of agricultural production and manufacturing sectors are provided. The data presented in this chapter are based on Manufacturing Establishment Censuses and Surveys, Ministry of Agriculture Development, the data compiled for National Accounting purposes etc.

Chapter III contains a social and demographic aspect which includes population data provided by National Population Censuses of Nepal and Nepal Demographic and Health Surveys (NDHS). Education data was provided by Ministry of Education. Poverty data is based on Nepal Living Standards Survey (NLSS). Data on calorie intake and malnutrition are based mainly on Small Area Estimation (SAE) conducted by CBS.

Chapter IV presents data on air and climate based on the data obtained from the Department of Hydrology and Meteorology. Data on temperature, rainfall, wind speed and sunshine duration are collected from stations located in various districts of the country.

Chapter V deals mainly on land and soil data, land use, livestock in arid and semi arid land, use of fertilizer and pesticides. Major sources of data are National Sample Censuses of Agriculture conducted by CBS, Land Resource and Mapping Project (LRMP), Department of Forest, Department of Forest Research and Survey, Water and Energy Commission Secretariat (WECS). Information provided by specific surveys and secondary sources are also included.

Chapter VI deals on water. Data on supply of drinking water provided by various agencies, quality of water, standards set for water use for various purposes are presented in this chapter. Major sources of data were Department of Irrigation, Department of Water Supply and Sewage (DWSS), Nepal Water Supply and Corporation (NWSC) and Water and Energy Commission Secretariat (WECS).

Chapter VII contains data on other natural resources, extraction of mineral resources, forestry etc.

Chapter VIII contains data on waste disposal and hazardous waste management.

Chapter IX covers human settlement and data included in the chapter are mainly urban population, housing status, vehicles in use etc. Major sources of information are CBS and Department of Transport Management, Department of Road etc.

Chapter X contains information on natural disasters provided by Ministry of Home Affairs, Department of Water Induced Disaster Prevention, Department of Mines and Geology etc.

Appendices include a list of Policies Acts and Rules, Conventions related to environment management, Agenda 21, major divisions/sections of International Classifications such has ISIC, CPC, COFOG, COICOP, COPNI, COPP, CEPA, SEEA Assts classification and MDGs.

A Glossary has also been included to facilitate for common understanding.

Chapter II

Economic Issues

Table 2.1: Summary of Macro Economic Indicators of Nepal, 2000/01-2013/14

Description	2057/58	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66	2066/67	2067/68	2068/69	2069/70R	2070/71P
	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Percapita GDP (NRs.)	19072	19410	20337	21689	23292	25279	28905	31946	38172	45435	51594	56880	62196	69919
Annual Change in nominal percapita GDP (%)		1.77	4.78	6.64	7.40	8.53	14.34	10.52	19.49	19.03	13.56	10.25	9.35	12.42
Percapita GNI (NRs.)	19146	19384	20309	21620	23357	25471	29200	32257	38626	45782	51879	57337	62677	71305
Annual Change in nominal percapita GNI (%)		1.25	4.77	6.46	8.03	9.05	14.64	10.47	19.74	18.53	13.32	10.52	9.31	13.77
Percapita GNDI (NRs.)	21979	22265	23430	25051	27218	30346	34323	39417	48262	56549	63499	73082	80964	96155
Annual Change in nominal percapita GNDI (%)		1.30	5.23	6.92	8.65	11.49	13.10	14.84	22.44	17.17	12.29	15.09	10.79	18.76
Percapita GDP at constant price (NRs.)	19072	18675	18984	19436	19670	19884	21129	22110	22793	23561	24144	24962	25578	26619
Annual Change in real percapita GDP (%)		-2.08	1.66	2.38	1.20	1.09	6.26	4.64	3.09	3.37	2.48	3.39	2.47	4.07
Percapita GNI at constant price (NRs.)	19146	18657	18962	19401	19802	20186	21569	22567	23301	24152	24664	25582	26326	27762
Annual Change in real percapita GNI (%)		-2.55	1.63	2.32	2.07	1.94	6.85	4.63	3.25	3.65	2.12	3.72	2.91	5.45
Percapita GNDI at constant price (NRs.)	21979	21430	21876	22479	23076	24050	25354	27577	29114	29831	30188	32607	34008	37437
Annual Change in real percapita GNDI (%)		-2.50	2.08	2.76	2.65	4.22	5.42	8.77	5.57	2.46	1.20	8.01	4.30	10.08
Percapita incomes in US$														
Nominal Percapita GDP (US$)	259	255	261	293	328	350	410	491	497	610	714	702	707	703
Nominal Percapita GNI (US$)	260	254	261	292	329	352	414	496	502	614	718	708	713	717
Nominal Percapita GNDI (US$)	298	292	301	339	383	420	487	606	628	759	879	902	920	967
Final Consumption Expenditure as percentage of GDP	88.34	90.51	91.44	88.25	88.44	91.02	90.18	90.17	90.57	88.55	86.03	89.01	89.90	91.08
Gross Domestic Saving as percentage of GDP	11.66	9.49	8.56	11.75	11.56	8.98	9.82	9.83	9.43	11.45	13.97	10.99	10.10	8.92
Gross National Saving as percentage of GDP	26.91	24.20	23.77	27.25	28.41	29.03	28.56	33.22	35.87	35.91	37.04	39.47	40.27	46.44
Exports of goods and services as percentage of GDP	22.56	17.74	15.70	16.68	14.58	13.45	12.86	12.78	12.42	9.58	8.90	10.07	10.70	12.14
Imports of goods and services as percentage of GDP	33.24	28.49	28.55	29.46	29.48	31.32	31.72	33.26	34.66	36.40	32.92	33.58	37.51	40.30
Gross Fixed Capital Formation as percentage of GDP	19.20	19.56	19.92	20.34	19.94	20.72	21.07	21.88	21.35	22.21	21.41	20.77	22.58	23.13
Resource Gap as percentage of GDP(+/-)	4.56	3.95	2.36	2.72	1.96	2.17	-0.12	2.90	4.19	-2.36	-0.95	4.97	3.37	9.37
Workers' Remittances as percentage of GDP					11.12	14.94	13.76	17.49	21.22	19.43	18.55	23.54	25.67	30.21
Exchange rate (US$: NRs)	73.70	76.25	77.83	73.97	71.05	72.32	70.49	65.02	76.88	74.54	72.27	81.02	87.96	99.43
Population (millions)	23.15	23.67	24.20	24.75	25.30	25.87	25.18	25.53	25.89	26.25	26.49	26.85	27.21	27.58

R = Revised/P = Preliminary

Source: Central Bureau of Statistics

Table 2.2: Gross Value Added by Industrial Division (at current prices)

Rs. millions

	Industrial Classification	2057/58	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66	2066/67	2067/68	2068/69	2069/70R	2070/71P
		2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
A	Agriculture and forestry	153781	163925	170634	183621	196686	208591	223536	243323	305477	391519	473270	500465	527869	583692
B	Fishing	1844	2165	2168	2504	2682	3113	3287	3868	4076	4236	4879	5819	6646	8659
C	Mining and Quarrying	1817	2149	2310	2507	2748	3134	3417	4375	5084	5926	6956	8166	9616	11253
D	Manufacturing	38409	37736	38826	41673	44885	47840	52172	57185	65447	70924	80531	91164	100312	108745
E	Electricity gas and water	7750	9138	11447	11974	12782	13172	14841	15219	14629	15244	16002	17518	20368	21726
F	Construction	25585	28838	30955	33254	36644	40952	45099	54134	63741	77289	89356	98539	108979	120863
G	Wholesale and retail trade	69928	64778	68695	79219	79839	90214	92648	105306	124121	161067	179306	198164	228747	267510
H	Hotels and restaurants	8459	7143	7540	8942	8895	9398	10043	11503	13943	17347	21057	25307	29886	35303
I	Transport, storage and communications	31425	34959	39362	46283	51336	61250	69555	76818	92618	95304	105834	122354	140537	156500
J	Financial intermediation	11455	12202	12861	13728	17342	21979	28467	33539	39100	46083	50111	58529	62183	67278
K	Real estate, renting and business activities	35267	36525	38251	39991	49242	60042	70791	73636	81625	93747	106236	123213	138587	150900
L	Public Administration and defence	5288	7237	8070	8019	9548	10967	12227	14352	18556	21695	24830	30547	32236	42578
M	Education	17372	20823	24582	26313	31671	34996	40939	48722	62642	61384	67739	81797	91736	114833
N	Health and social work	4178	4626	5408	5825	7017	7842	8568	10963	13744	15382	17087	20431	22327	26555
O	Other community, social and personal service activities	12896	11808	12436	14140	15262	16840	21774	26500	34089	41423	46947	55461	58028	73374
	Total GVA including FISIM	*425,454*	*444,052*	*473,545*	*517,994*	*566,579*	*630,330*	*697,364*	*779,442*	*938,890*	*1,118,571*	*1,290,142*	*1,437,474*	*1,578,058*	*1,789,768*
	Financial Intermediation Services Indirectly Measured (FISIM)	12026	13655	13221	17294	18094	19212	21505	24185	29362	35156	41660	49992	55205	65172
	Gross Domestic Product (GDP) at basic prices	*413,428*	*430,396*	*460,325*	*500,699*	*548,485*	*611,118*	*675,859*	*755,257*	*909,528*	*1,083,415*	*1,248,482*	*1,387,482*	*1,522,853*	*1,724,596*
	Taxes less subsidies on products	28090	29046	31906	36050	40927	42966	51968	60401	78744	109358	118472	139862	169790	203921
	Taxes on Products					41266				79396	110264	119482	141011	171004	205205
	Subsidies on Products					339				652	905	1010	1149	1215	1284
	Gross Domestic Product (GDP)	*441,519*	*459,443*	*492,231*	*536,749*	*589,412*	*654,084*	*727,827*	*815,658*	*988,272*	*1,192,774*	*1,366,954*	*1,527,344*	*1,692,643*	*1,928,517*

R = Revised, P = Preliminary

Note : NSIC Division P & Q are included in the Division O.

Source : Central Bureau of Statistics.

Table 2.3: Gross Value Added by Industrial Division (at constant 2000/01 prices)

Rs. millions

NSIC	Industrial Classification	2057/58	2058/59	2059/60	2060/61	2061/62	2062/63	2063/64	2064/65	2065/66	2066/67	2067/68	2068/69	2069/70R	2070/71P
		2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
A	Agriculture and forestry	153781	158417	163676	171394	177304	180260	181958	192514	198257	202196	211271	220950	223310	233850
B	Fishing	1844	2005	2085	2340	2507	2755	2838	3045	3207	3321	3516	3781	3883	4074
C	Mining and quarrying	1817	1977	2040	2031	2169	2348	2383	2513	2531	2585	2637	2770	2861	2966
D	Manufacturing	38409	36364	36380	37163	38136	38898	39891	39545	39132	40291	41923	43445	45059	45899
E	Electricity gas and water	7750	8631	10274	10693	11117	11562	13065	13204	12750	12989	13564	14690	14731	15438
F	Construction	25585	27225	27798	27701	28503	30690	31453	33043	33371	35430	37126	37207	37931	39016
G	Wholesale and retail trade	69928	61837	63233	70066	65694	68099	64292	66962	70481	75237	76298	78967	84328	91776
H	Hotels and restaurants	8459	6917	7056	7955	7525	8001	8278	8851	9056	9646	10244	11000	11605	12429
I	Transport, storage and communications	31425	34055	35825	38509	40985	42001	44094	48226	51585	54657	57504	62160	66770	71789
J	Financial intermediation	11455	11892	12090	12838	15957	19843	22103	24142	24632	25327	26163	27071	26825	27305
K	Real estate, renting and business activities	35267	33543	32212	31538	34700	36900	41240	45544	46421	47818	48894	50346	51706	53261
L	Public administration and defence	5288	7237	8070	8019	8551	9139	9262	9319	10012	10405	10806	11203	11822	12492
M	Education	17372	21030	23913	25138	27606	28640	30738	32716	36233	38638	39799	42019	44506	47196
N	Health and social work	4178	4487	5171	5487	6109	6470	6888	7474	8191	8581	9012	9591	10129	10691
O	Other community, social and personal service activities	12896	11785	12303	13955	13483	13933	16643	18204	20520	22966	24599	26163	27369	28647
	Agriculture, Forestry and Fishing	155625	160421	165761	173734	179810	183015	184796	195559	201464	205517	214786	224730	227193	237924
	Non-Agriclture	269830	266979	276366	291092	300535	316525	330331	349744	364914	384570	398569	416631	435643	458904
	Total GVA including FISIM	*425,454*	*427,400*	*442,127*	*464,826*	*480,345*	*499,540*	*515,127*	*545,303*	*566,377*	*590,086*	*613,355*	*641,362*	*662,836*	*696,828*
	Financial Intermediation Services Indirectly Measured (FISIM)	12026	13308	12428	16172	17180	19105	21476	23043	23725	24327	25821	26725	26919	28136
	Gross Domestic Product (GDP) at basic prices	*413,428*	*414,092*	*429,699*	*448,654*	*463,165*	*480,435*	*493,651*	*522,260*	*542,652*	*565,759*	*587,534*	*614,637*	*635,917*	*668,692*
	Taxes less subsidies on products	28090	27957	29789	32350	34574	34051	38388	42257	47455	52770	52160	55643	60183	65528
	Gross Domestic Product (GDP)	*441,518*	*442,049*	*459,488*	*481,004*	*497,739*	*514,486*	*532,038*	*564,517*	*590,107*	*618,529*	*639,694*	*670,279*	*696,101*	*734,219*

R = Revised, P = Preliminary

Note : NSIC Division P & Q are included in the Division O.

Source : Central Bureau of Statistics.

Table 2.4 : Production of Agricultural Commodities

(unit in '000 mt)

Agricultural Commodities	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Food grains	**6465**	**6985**	**7172**	**7248**	**7361**	**7745**	**7767**	**7656**	**7329**	**8069**	**8115**	**7763**	**8615**	**12293**	**11330**
Paddy	3710	4030	4216	4165	4133	4456	4290	4209	3681	4299	4524	4023	4460	5072	4505
Maize	1346	1445	1484	1511	1569	1590	1716	1734	1820	1879	1931	1855	2067	2179	1999
Wheat	1086	1184	1158	1258	1344	1387	1442	1394	1515	1572	1344	1557	1746	1846	1727
Millet (Kodo)	291	295	283	283	283	283	290	291	285	291	293	300	303	3151	3055
Barley	32	31	30	31	32	28	29	28	28	28	23	28	30	35	34
Buckwheat													9	10	10
Cash Crops	**3202**	**3428**	**3678**	**3876**	**4020**	**4102**	**4276**	**4597**	**4698**	**4694**	**4933**	**5183**	**5719**	**5710**	**5817**
Sugarcane	1972	2103	2212	2248	2343	2305	2376	2463	2600	2485	2354	2495	2932	2930	2930
Oilseeds	120	123	132	135	125	133	142	139	136	134	135	155	175	179	179
Tobacco	4	4	4	4	3	3	3	3	3	3	2	2	2	3	2
Jute	15	15	16	16	17	17	16	17	17	17	18	13	13	14	16
Potato	1091	1183	1314	1473	1531	1643	1739	1975	1943	2055	2424	2518	2597	2584	2690
Other Crops	**2029**	**2175**	**2383**	**2463**	**2585**	**2679**	**2903**	**2992**	**3164**	**3457**	**3713**	**3993**	**4336**	**4672**	**4623**
Pulses	229	237	243	250	257	265	271	267	274	270	255	262	318	320	357
Fruits	456	447	487	474	519	511	553	535	575	631	686	707	794	1030	939
Vegetables	1343	1490	1653	1738	1800	1890	2065	2190	2299	2539	2754	3004	3204	3299	3302
Tea	4	5	6	7	8	12	13	13	15	16	16	17	17	19	21
Coffee	0.05	0.07	0.09	0.14	0.19	0.22	0.25	0.30	0.46	0.28	0.27	0.31	0.40	0.4	0.4
Cotton	0.68	0.74	0.46	0.15	0.06	0.01	0.01	0.06	0.05	0.07	0.06	0.11	0.11	0.13	0.15
Honey	0.139	0.15	0.16	0.53	0.53	0.58	0.6	0.65	0.65	1	0.85	1	1.2	1.5	1.6
Cocoon	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	NA	0.03	0.04
Mushroom											1	1.1	1.3	1.5	1.7
Spice Crops	**108.16**	**110.45**	**124.27**	**132.38**	**201.06**	**219.86**	**223.26**	**226.91**	**238.64**	**243.1**	**276**	**321.23**	**357.21**	**364.3**	**345.1**
Cardamom	4.33	6.53	6.08	6.18	5.68	5.98	6.07	6.65	6.79	7.1	7	5.23	5.21	6	5.8
Turmeric	8.43	10.59	13.06	15.17	21.59	23.03	23.23	23.57	25.4	25	32	38	41	35.3	35.7
Ginger	81.80	74.99	84.37	87.91	140.06	150.59	152.7	154.20	160.58	161	179	211	240	255	235
Chilies	4.82	6.36	6.53	7.08	10.87	11.97	12.62	13.78	15.57	19	24	28	27	27	27.9
Garlic	8.78	11.97	14.23	16.03	22.67	28.28	28.61	28.72	30.31	31	34	39	44	41	40.7

Source : Ministry of Agriculture Development (Agri-Business Promotion and Statistics Division).

Table 2.5 : Production of Livestock Products

Products	Unit	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Milk Production	**(000 mt)**	**1124**	**1159**	**1196**	**1232**	**1274**	**1312**	**1352**	**1389**	**1445**	**1496**	1557	**1623**	**1681**
Cow Milk		343	352	362	369	380	385	293	401	414	429	442	469	492
Buff Milk		781	807	834	863	895	927	959	988	1032	1067	1115	1154	1188
Meat Production	**(000 mt)**	**194**	**199**	**204**	**208**	**215**	**219**	**227**	**234**	**242**	**249**	**277**	**288**	**295**
Buffalo		125	128	131	134	139	142	147	151	157	162	168	172	175
Mutton (Sheep)		3	3	3	3	3	2	3	2	3	3	3	3	3
Goat		38	39	40	41	42	43	45	46	48	50	52	54	56
Pig		15	16	16	15	16	16	16	16	17	17	18	18	19
Chicken		13	14	15	16	16	16	16	16	17	17	36	40	43
Duck		0	0	0	0	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Egg Production	**No (000)**	**50732**	**53842**	**55736**	**57557**	**59013**	**600800**	**614848**	**631253**	**629940**	**643203**	**704000**	**801370**	**887240**
Hen Egg		49157	52276	54173	56003	57652	587219	600966	617455	616312	629793	690628	788310	874194
Duck Egg		1576	1566	1564	1553	1361	13581	13882	13798	13628	13410	13490	13060	13046
Wool Production	**(000 kg)**	**614**	**609**	**601**	**598**	**590**	**587**	**588**	**585**	**584**	**580**	**587**	**587**	**588**
Fish Production	**(000 mt)**	**33**	**35**	**37**	**40**	**42**	**45**	47	**48**	**48**	**50**	**52**	**56**	**58**

Source : Ministry of Agriculture Development, Agri-Business Promotion and Statistics Division.

Table 2.6: Quarterly Manufacturing Production Index

ISIC	CPC	Overall Index of Manufacturing Production		Annual 2066/67	Annual 2067/68	I Qrt 2068/69	II Qrt 2068/69	III Qrt 2068/69	IVQrt 2068/69	Annual 2068/69	IQrt 2069/70	IIQrt 2069/70	IIIQrt 2069/70	IVQrt 2069/70	Annual 2069/70	IQrt 2070/71	IIQrt 2070/71**
				102.60	107.12	100.46	108.97	117.45	119.60	111.62	113.40	115.80	118.38	116.54	116.03	119.25	113.89
151		**Manufacture of Vegetable,Oils & Fats**	**9.62**	**98.08**	**94.81**	**99.40**	**94.07**	**80.00**	**64.23**	**84.43**	**98.45**	**97.58**	**80.10**	**82.10**	**89.56**	100.45	97.05
	2160	Vegetable ghee	5.72	91.82	71.74	68.78	59.83	50.33	43.76	55.68	86.39	72.20	43.10	48.46	62.54	48.43	48.04
	2163	Mustard oil	1.32	107.85	99.08	111.19	111.19	151.53	105.65	119.89	139.73	136.30	127.20	102.26	126.37	124.04	94.76
	2165	Soyabean oil	2.57	106.97	143.94	161.47	161.47	109.17	88.44	130.14	104.04	134.14	138.20	146.59	130.74	204.06	207.31
152		**Manufacture of dairy products**	**1.91**	**109.87**	**108.17**	**102.90**	**98.72**	**118.07**	**120.39**	**110.02**	**111.74**	**106.66**	**118.43**	**106.94**	**110.94**	**109.43**	111.40
	2211	Processed Milk	1.91	109.87	108.17	102.90	98.72	118.07	120.39	110.02	111.74	106.66	118.43	106.94	110.94	109.43	111.40
153		**Manufacture of grain mill products, Prepared animal feeds**	**9.35**	**91.95**	**99.08**	**108.78**	**109.16**	**110.80**	**116.36**	**111.28**	**107.20**	**134.72**	**104.10**	**99.35**	**111.34**	**119.54**	136.30
	2316	Rice	7.79	89.37	97.42	106.67	106.67	108.55	113.33	108.81	104.08	136.53	98.53	95.14	108.57	119.64	135.56
	2311	Wheat flour	1.39	104.82	105.57	117.57	119.77	124.06	133.53	123.73	123.02	125.87	134.33	120.18	125.85	121.09	143.40
	2331	Animal feed	0.16	105.88	122.83	134.83	137.44	105.20	114.95	123.11	121.38	123.86	112.27	123.36	120.22	101.70	111.39
		Manufacture of other food products	**6.45**	**104.02**	**107.77**	**81.64**	**151.48**	**162.98**	**97.05**	**123.29**	**91.62**	**137.89**	**220.36**	**88.62**	**134.62**	**98.52**	117.70
	2342	Biscuit	0.94	103.28	94.57	87.29	75.39	67.02	77.18	76.72	99.70	94.57	96.62	71.07	90.49	69.70	65.99
	2341	Bread	1.07	83.85	128.12	127.27	127.27	157.76	168.08	145.10	133.59	139.36	143.00	167.66	145.90	168.75	173.60
	2353	Sugar	1.82	105.07	117.06	0.00	253.00	276.96	0.00	132.49	-	163.74	456.04	0.00	154.94	0.00	71.70
	2365	Chocolate	0.73	102.85	100.65	103.24	106.69	104.76	115.57	107.56	138.93	143.25	141.68	130.23	138.52	167.53	204.54
	2372	Noodles	1.17	113.19	110.50	145.89	164.10	166.54	152.63	157.29	131.06	138.09	149.52	155.32	143.50	157.46	154.81
	2391	Processed tea	0.72	118.59	74.07	86.47	55.08	61.18	153.68	89.10	138.25	121.20	96.04	67.47	105.74	115.11	70.04
155		**Manufacture of beverages**	**6.71**	**124.12**	**135.84**	**121.31**	**136.85**	**157.48**	**168.66**	**146.08**	**142.80**	**149.96**	**149.41**	**169.27**	**152.86**	**163.78**	110.71
	2412	Liquor rectified	2.21	108.49	132.94	115.08	155.71	154.73	154.21	144.93	116.54	124.50	131.52	151.38	130.99	121.73	158.86
	2423	Beer	2.38	151.63	152.88	123.12	124.99	181.15	183.66	153.23	167.08	186.98	191.32	166.27	177.91	152.58	103.49
	2449	Soft drink	2.13	109.56	119.78	125.75	130.55	133.86	166.89	139.26	142.88	134.98	121.09	191.20	147.54	219.97	68.81
160		**Manufacture of tobacco products**	**6.66**	**101.78**	**125.08**	**115.00**	**114.03**	**124.01**	**123.53**	**119.15**	**121.51**	**117.62**	**116.63**	**120.44**	**119.05**	**130.16**	128.03
	2501	Cigarette	6.66	101.78	125.08	115.00	114.03	124.01	123.53	119.15	121.51	117.62	116.63	120.44	119.05	130.16	128.03

171		**Manufacture of textiles**	**6.31**	**93.88**	**70.84**	**59.40**	**57.88**	**71.87**	**92.93**	**70.52**	**91.57**	**54.71**	**69.44**	**82.66**	**74.60**	**57.39**	56.64
	2621	Yarn	1.50	74.59	55.97	58.62	54.09	103.77	58.28	68.69	8.56	54.31	78.37	62.51	65.94	55.37	53.20
	2669	Clothes	4.81	99.90	75.47	59.65	59.07	61.93	103.73	71.09	98.75	54.83	66.66	88.94	77.30	58.02	57.71
172		**Manufacture of other Textiles**	**4.17**	**89.29**	**84.22**	**93.43**	**98.22**	**96.10**	**121.53**	**102.32**	**113.40**	**95.27**	**102.71**	**99.45**	**102.71**	**125.34**	111.49
	2721	Woolen carpet	2.91	93.74	66.32	80.71	88.09	82.82	113.52	91.29	84.65	83.64	83.22	92.96	86.12	105.95	83.58
	2715	Jute goods	1.26	79.02	125.57	122.80	121.60	126.77	140.03	127.80	179.80	122.15	147.72	114.43	141.03	170.14	175.93
181		**Manufacture of wearing apparel**	**1.17**	**115.24**	**116.74**	**92.18**	**79.87**	**95.75**	**119.68**	**96.87**	**134.65**	**115.94**	**111.80**	**82.17**	**111.14**	**123.37**	135.89
	2825	Garment	1.17	115.24	116.74	92.18	79.87	95.75	119.68	96.87	134.65	115.94	111.80	82.17	111.14	123.37	135.89
191		**Manufacture of tanning and dressing of leather**	**0.53**	**155.65**	**100.87**	**97.12**	**69.59**	**78.28**	**80.81**	**81.45**	**83.40**	**81.61**	**96.16**	**65.66**	**81.71**	**65.52**	100.49
	2912	Processed leather	0.53	155.65	100.87	97.12	69.59	78.28	80.81	81.45	83.40	81.61	96.16	65.66	81.71	65.52	100.49
201		**Manufacture of saw milling and planning of wood**	**0.67**	**109.52**	**58.66**	**49.44**	**49.44**	**59.92**	**53.03**	**52.96**	**67.38**	**55.29**	**45.43**	**37.32**	**51.36**	**46.54**	45.85
	3110	Wood sawn	0.67	109.52	58.66	49.44	49.44	59.92	53.03	52.96	67.38	55.29	45.43	37.32	51.36	46.54	45.85
202		**Manufacture of products of wood**	**0.60**	**112.61**	**116.30**	**116.99**	**116.99**	**94.93**	**97.00**	**106.48**	**126.97**	**112.11**	**111.25**	**130.68**	**120.25**	**152.97**	160.83
	3141	Ply wood	0.60	112.61	116.30	116.99	116.99	94.93	97.00	106.48	126.97	112.11	111.25	130.68	120.25	152.97	160.83
210		**Manufacture of paper & paper products**	**2.57**	**94.97**	**77.30**	**81.51**	**83.60**	**81.01**	**89.71**	**83.96**	**90.74**	**77.71**	**88.88**	**87.74**	**86.27**	**84.30**	70.88
	3214	Paper excluding newsprint	0.57	75.69	68.96	73.75	72.90	79.89	95.67	80.55	105.18	83.22	82.01	76.43	86.71	54.74	63.46
	3215	Cartoon box	2.00	100.51	79.69	83.74	86.68	81.33	87.99	84.94	86.60	76.13	90.85	90.99	86.14	92.79	73.01
232		**Manufacture of refined petroleum products**	**1.04**	**105.56**	**111.57**	**90.20**	**90.20**	**106.78**	**106.57**	**98.44**	**107.56**	**86.16**	**87.04**	**128.83**	**102.40**	**106.78**	109.97
	3338	Lube Oil	1.04	105.56	111.57	90.20	90.20	106.78	106.57	98.44	107.56	86.16	87.04	128.83	102.40	106.78	109.97
		Manufacture of Basic Chemical	**1.19**	**111.30**	**106.51**	**68.40**	**89.51**	**84.51**	**78.71**	**80.28**	**58.03**	**57.00**	**152.49**	**100.70**	**92.05**	**78.25**	92.20
241	3441	Rosin	1.19	111.30	106.51	68.40	89.51	84.51	78.71	80.28	58.03	57.00	152.49	100.70	92.05	78.25	92.20
242		**Manufacture of other chemical products**	**5.35**	**100.89**	**110.65**	**113.18**	**111.85**	**131.75**	**127.53**	**121.08**	**140.20**	**136.82**	**127.85**	**126.33**	**132.80**	**118.26**	106.73
	3511	Paint	0.75	105.28	149.93	178.53	169.10	172.96	170.21	172.70	238.60	184.55	175.11	135.50	183.44	202.10	163.37
	3529	Medicine	1.63	100.06	113.34	114.30	114.30	147.36	139.77	128.94	139.26	141.36	147.72	148.16	144.13	148.46	148.49
	3532	Soap	2.97	100.24	99.26	96.05	96.05	112.78	110.04	103.73	115.87	122.28	105.01	112.03	113.80	80.51	69.50

252		**Manufacture of plastic product**	**5.74**	**101.71**	**94.10**	**81.80**	**92.79**	**147.92**	**127.78**	**112.57**	**119.71**	**116.04**	**120.07**	**131.91**	**121.93**	**140.72**	121.34
	3641	plastic product	**5.74**	101.71	94.10	81.80	92.79	147.92	127.78	112.57	119.71	116.04	120.07	131.91	121.93	140.72	121.34
269		**Manufacture of non Metallic**															
		mineral products n.e.c	**7.92**	**104.48**	**133.63**	**71.69**	**111.87**	**150.02**	**158.32**	**122.98**	**100.20**	**120.97**	**145.18**	**141.61**	**126.99**	**109.13**	123.18
	3735	Bricks	1.62	88.13	77.48	0.00	96.53	111.83	166.00	93.59	-	135.38	159.66	120.88	103.98	0.00	151.73
	3744	Cement	5.28	114.69	161.66	89.40	117.41	170.57	163.24	135.16	128.79	115.13	145.79	157.59	136.83	147.66	122.75
	3769	concrete	0.76	43.64	40.54	76.10	98.60	95.94	99.53	92.54	101.13	108.68	102.92	50.11	90.71	37.10	50.53
	3756	Hume pipe	0.26	176.65	186.46	146.04	133.76	128.68	182.54	147.75	141.12	185.83	165.93	213.71	176.64	217.11	166.40
271		**Manufacture of basic iron and steel**	**11.71**	**107.78**	**111.53**	**120.96**	**111.69**	**110.18**	**107.462**	**112.57**	**129.00**	**113.64**	**111.91**	**135.91**	**122.62**	**127.79**	115.56
	4124	Iron rod & billets	5.54	110.96	110.46	119.60	119.60	105.76	98.14	110.78	133.20	110.81	98.45	126.33	117.20	127.82	114.56
	4127	GI pipe	6.17	104.93	112.49	122.18	104.58	114.14	115.83	114.18	125.23	116.18	124.00	144.51	127.48	127.76	116.45
273		**Manufacture of casting of metals**	**0.86**	**89.04**	**115.51**	**124.82**	**135.91**	**106.27**	**106.21**	**118.31**	**120.29**	**110.71**	**103.56**	**72.32**	**101.72**	**88.90**	75.23
	4291	Domestic metal product	0.31	97.48	84.39	93.38	93.38	84.42	78.70	87.47	73.68	77.60	86.46	63.48	75.31	93.03	78.54
	4153	almuneum products	0.55	84.28	133.05	142.55	159.88	118.59	121.72	135.68	146.56	129.37	113.20	77.31	116.61	86.58	73.37
281		**Manufacture of structural metal**	**7.17**	**101.91**	**110.69**	**119.87**	**123.61**	**112.74**	**187.52**	**135.94**	**118.90**	**140.66**	106.54	165.16	132.81	153.07	148.71
	4219	Structural metal Product	7.17	101.91	110.69	119.87	123.61	112.74	187.52	135.94	118.90	140.66	106.54	165.16	132.81	153.07	148.71
313		**Manufacture of electric machinary apparatus**															
	4651	**Manufacture of wire & cable**	**1.74**	**102.84**	**138.31**	**162.47**	**182.46**	**150.67**	**120.92**	**154.13**	**152.01**	**149.40**	**157.31**	**69.63**	**132.09**	**222.23**	146.56
	4651	Electrical wire & cable	1.74	102.84	138.31	162.47	182.46	150.67	120.92	154.13	152.01	149.40	157.31	69.63	132.09	222.23	146.56
361		**Manufacture of Furniture Manufacture**	**0.56**	**99.98**	**104.37**	**87.90**	**103.91**	**108.15**	**114.67**	**103.66**	**121.56**	**115.16**	**108.66**	**101.87**	**111.81**	**108.44**	112.80
	3814	Furniture	0.56	99.98	104.37	87.90	103.91	108.15	114.67	103.66	121.56	115.16	108.66	101.87	111.81	108.44	112.80

**Weights are based on Census Of Manufacturing Establishments(CME)2006/2007*
*** Preliminary Estimates*
Note : Methodology for quarterly indices are reviewed and revised.

Table 2.7 : Production of Various Minerals and Quarrying Products

Minerals	Unit	2002/3	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2008/9	2010/11	2011/12	2012/13
1. Clay	mt	13736	12181	14785	13117	14208	14135	8950	9585	1321.5	9066.25	13400
2. Limestone (Chemical grade)	mt	13025	388109	263701	402130	822.42	701950	582999	514023	768150	1276452	4719542
3. Magnesite	mt											
4. Kynite												
i. I. Q.	mt	3.79	10.35	26.82	20.7	16.39	14.85	10.39	236.07	22.26	20.1	19.335
ii. G. Q.	kg.	420	1115	2880	2300	1810	1610	650	1063	2585.6	2900	
5. Quartz crystal												
i. I. Q.	mt	177	121.5	109.2	94.9	90.05	77.8	NA	26	3.4	NA	6.614
ii. G. Q.	kg	1765	1215	NA	NA	905	930	NA	1216	1003	239	
6. Salt	mt	5	3.5	2.45	NA	2.45	NA	NA				
7. Talc	mt	6905	3435	5832	6648	NA	NA	NA	5674.2	3556.1	6935	5140.28
8. Tourmaline (I.Q.)	mt	NA	NA	7	6.6	4.9	3.5	2	39.5	67.76	59.12	26.718
9. Coal	mt	11848	10459	9259	11963	16374	13845	14819	11798.5	13165	9406.38	14084.1
10. Lignite	mt	NA	58	30	NA	98	60	NA	NA	NA	NA	NA
11.Mica	mt	NA	NA	NA	NA	9.05	13	NA	NA	NA	NA	NA
12. Limestone (Cement grade)	mt	269379	388109	263701	402130	NA	NA	NA	NA	NA	NA	NA
13. Marble	mt	NA	NA	NA	NA	NA	NA	NA	2688.8	1124	13595.2	2994.5
i. Aggregates	m^3	40936	40368	48157	44954	NA	NA	8062	2979.5	1118.7	13593.2	NA
ii. Chips	mt	395	481	436	384	945	441	1047	15253.3	15564	1414	NA
iii. Crazy	Sq. m.	681	728	NA	NA	NA	NA	NA	NA	NA	NA	NA
iv. Slab	Sq. m	46197	56014	2358	2811	NA	NA	NA	NA	NA	NA	NA

NA= Not Available

Note: 1) contractors (lease holders)

2) The above production data have been compiled on the basis of mining licence renewal period

3) The mining licence renewal period is the last date of fiscal year since 1981.

Sources: Department of Mines and Geology

Table 2.8 : Supply of Forest Products

Forest Production	Unit	Year							
		2002/03	2003/04	2004/05	2005/06	2007/08	2008/09	2009/10	2011/12
Herbal	kg	NA	NA	4575579	4575579	3380857	NA	2171522	2546155
Timber	ft^3	890189	973043	926310	924843	1271515	NA	1225713	675561
Fuel wood	Chatta	1160.32	829.87	NA	NA	1713	NA	1351.97	437
Lauth Salla	kg	NA	NA	7535	7535	13353	NA	5000	750
Khair	ft^3	5112785	500106	16210	16210	587661	32057	258445	18413
Argeli	kg	NA	NA	13999	13999	20128	26656	6760	99062
Khoto	kg	NA	5803	4091748	4091747	8009249	3276906	3105607	2704157
Lokta	kg	NA	NA	109953	109953	70000	64616	13233	NA
Other forest products	kg	NA	NA	NA	NA	4.1E+07	NA	30331799	NA

Source : Department of Forests (Community Forest Division)

Table 2.9 : Food Consumption Pattern (NLSS Food Basket Composition)

(per capita/g/d)

S. N.	Food Items	1995/96	2003/04	2010/11
1	Fine rice	26.15	26.4	39.41
2	Coarse rice	217.3	219.35	288.64
3	Beaten rice, flattened rice	3.47	3.50	9.16
4	Maize	58.55	59.1	31.61
5	Maize flour	40.07	40.45	48.13
6	Wheat flour	91.77	92.64	82.25
7	Millet	35.57	35.91	17.97
8	Black Gram *(Mas)*	1.9	1.92	3.47
9	Lentil *(Musuro)*	8.17	8.25	8.63
10	Rahar	1.02	1.03	
11	Red Gram	0.72	0.73	1.48
12	Horse Gram *(Chana)*			2.53
13	Beans			2.34
14	Eggs	0.49	0.49	2.27
15	Milk	30.7	31.06	63.43
16	Baby milk/ power milk	0.01	0.01	0.09
17	Curd/ whey	1.21	1.22	34.37
18	Ghee	1.17	1.19	1.49
19	Vegetable oil	0.22	0.22	0.73
20	Mustard oil	7.35	7.42	12.77
21	Potatoes	28.88	29.15	64.07
22	Colocassia			14.32
23	Onions	5.84	5.90	16.19
24	Cauliflower/ cabbage	4.06	4.10	10.73
25	Tomatoes	2.41	2.43	4.08
26	Pointed gourd			4.52
27	Bitter gourd			4.21
28	Bananas	3.70	3.74	10.39
29	Citrus fruit	0.85	0.85	7.69
30	Mangoes	4.99	5.04	5.12
31	Apples	0.37	0.38	2.26
32	Pineapple	0.10	0.10	0.33
33	Papaya	1.70	1.71	3.29
34	Fish	1.72	1.73	5.39
35	Mutton	1.64	1.66	3.45
36	Buffalo meat	1.79	1.81	4.71
37	Chicken	1.08	1.09	6.15
38	Salt	13.31	13.44	13.18
39	Sugar	3.55	3.58	10.22
40	Gur (sakhar)	0.77	0.78	0.9
41	Sweets (mithai)	1.91	1.93	0.55
42	Tea	0.25	0.26	

Note : Food consumption of the NLSS-III poverty basket is obtained by adjusting the NLSS-II basket for the change in the demographic composition of an average Nepali household.

Source : Central Bureau of Statistics.

Table 2.10 : District Wise RETs Installed under Alternative Energy Promotion Centre

S.N.	District	No.of System Installed (2011/12)					No.of System Installed (2012/13)				
		Biogas	SHS (including SSHS)	ICS (Including MICS)	IWM	MHPs (KW)	Biogas	SHS(including SSHS)	ICS(including MICS)	IWM	MHPs (KW)
1	Achham	—	1786	936	20	151	0	3790	1840	34	70
2	Arghakhachi	22	495	1594	—	—	15	832	1840	—	—
3	Baglung	22	330	3119	—	301	59	123	2129	—	124
4	Baitadi	2	1030	1751	59	30	0	3150	2035	66	—
5	Bajhang	74	2732	670	18	114	95	2974	945	86	209.5
6	Bajura	—	1003	1410	8	—	0	1141	1044	16	48
7	Banke	372	579	—	—	—	562	2244	—	—	—
8	Bara	308	63	735	—	—	436	453	1655	—	—
9	Bardiya	719	273	2400	—	—	1300	159	1	—	—
10	Bhaktapur	15	—	133	—	—	6	—	106	—	—
11	Bhojpur	3	513	2914	—	36	16	1322	2069	—	20
12	Chitwan	749	613	—	1	—	1309	1224	—	18	—
13	Dadeldhura	15	440	893	20	25	2	675	1571	24	—
14	Dailekh	—	4343	2533	—	—	0	8049	2555	126	—
15	Dang	1700	606	2273	—	—	1223	2012	1749	—	—
16	Darchula	11	1047	1624	42	—	13	1968	431	47	43
17	Dhading	574	1277	2704	22	39	946	1383	2274	19	26
18	Dhankuta	22	171	3599	—	80	6	29	2568	—	40
19	Dhanusha	16	6	2572	—	—	55	9	2280	—	—
20	Dolakha	114	91	3511	29	146	122	542	3305	27	37
21	Dolpa	—	50	—	—	30	0	384	—	19	—
22	Doti	40	1158	1814	29	—	20	2274	1910	85	102.5
23	Gorkha	342	220	2127	12	860	508	407	2086	16	—
24	Gulmi	43	916	1729	—	9.5	31	957	1838	—	47.5
25	Humla	1	252	95	—	50	0	247	4	—	—
26	Ilam	361	55	2528	—	—	289	256	2743	—	22.7
27	Jajarkot	5	2310	1127	21	14	1	4569	1383	56	—
28	Jhapa	788	—	3002	—	—	970	51	4281	—	186
29	Jumla	—	613	—	4	85	0	1436	207	51	—
30	Kailali	1641	1394	7054	10	—	2156	4396	7529	7	—
31	Kalikot	5	1770	820	—	36.5	17	3025	1850	51	—
32	Kanchanpur	960	93	1903	—	—	1094	161	1282	—	—
33	Kapilbastu	227	5	2940	—	—	355	70	4408	—	—
34	Kaski	540	41	946	—	50	589	32	1493	—	—
35	Kathmandu	23	—	89	—	—	14	—	97	—	—
36	Kavre	512	90	2364	—	95.37	655	292	2148	29	26
37	Khotang	2	571	3442	—	249	11	835	2449	—	86
38	Lalitpur	111	37	255	—	—	104	18	492	—	—
39	Lamjung	411	96	1749	—	66	717	196	1456	—	18
40	Mahottari	77	299	2548	—	—	205	303	1934	—	—
41	Makawanpur	2081	497	1881	25	8	1945	1456	1258	10	—
42	Manang	—	1	41	—	—	0	—	—	—	140
43	Morang	437	207	—	—	—	500	368	—	—	—
44	Mugu	—	1000	130	—	—	0	655	123	—	—
45	Mustang	1	44	44	—	—	0	16	—	—	—
46	Myagdi	32	224	1492	—	15	46	479	1258	—	30
47	Nawalparasi	339	818	1859	—	23	507	1142	1490	—	18
48	Nuwakot	331	107	2984	52	—	463	137	2608	62	23
49	Okhaldhunga	39	881	1700	—	53.7	43	1078	2024	98	103
50	Palpa	438	582	1620	—	28	378	1314	1190	—	43
51	Panchthar	41	184	2205	—	29.5	40	1334	2042	—	81
52	Parbat	9	51	2081	—	—	7	30	1258	—	—
53	Parsa	53	6	1159	—	—	99	82	2538	—	—
54	Pyuthan	92	557	2284	4	—	146	1305	1794	—	—
55	Ramechhap	190	703	2346	—	113	185	1288	2351	11	13
56	Rasuwa	61	11	465	4	—	105	69	441	66	—
57	Rautahat	117	429	3659	—	—	179	1125	5498	—	—
58	Rolpa	11	4677	1744	6	46.5	0	6207	1606	40	54
59	Rukum	5	2833	714	—	—	0	6195	955	34	102
60	Rupandehi	236	35	1893	—	—	303	5	4068	—	—
61	Salyan	4	2388	2044	21	10	0	5947	2056	38	—
62	Sankhuwasava	29	751	1685	—	—	11	832	1683	—	—
63	Saptari	17	164	—	—	—	19	136	—	—	—
64	Sarlahi	310	647	—	—	—	493	922	—	—	—
65	Sindhuli	537	2079	1979	48	26	708	3361	1958	45	—
66	Sindhupalchok	96	172	3235	27	—	137	165	2408	34	48
67	Siraha	41	47	1680	—	—	61	139	4327	—	—
68	Solukhumbu	22	257	1675	—	99.5	5	255	1430	—	30
69	Sunsari	120	21	2548	—	—	124	34	3034	—	—
70	Surkhet	270	2258	1592	56	—	211	7201	1820	34	—
71	Syanja	472	106	1620	—	—	433	124	1058	—	—
72	Tanahu	1425	743	1194	—	—	716	466	1287	—	—
73	Taplejung	9	1126	2615	—	91	19	780	2163	—	—
74	Tehrathum	36	84	2981	—	—	33	59	2394	—	—
75	Udayapur	251	1324	2210	—	—	295	2630	2307	7	—
	Total	**18979**	**53382**	**129262**	**538**	**3010.57**	**22112**	**99324**	**130,414**	**1256**	**1791.2**

SHS- Solar Home System, SSHS- Small Solar Home System, MICS- Metallic Improved Cooking Stove,ICS- Improved Cooking Stove (Mud),IWM- Improved Water Mill,MHPs- Micro Hydro Projects
Source: Alternative Energy Promotion Centre

Table 2.11 : Primary Production and Import of Coal in Nepal,1998/99-2012/13

(Unit in 000 tons)

Year	Primary Production	Import	Total	Change in %
1998/99	10.95	104.22	115.17	
1999/00	17.53	400.62	418.15	263.07
2000/01	16.59	279.84	296.43	-29.11
2001/02	9.61	248.39	258.00	-12.96
2002/03	11.85	215.91	227.76	-11.72
2003/04	10.46	279.84	290.30	27.46
2004/05	9.29	247.88	257.17	-11.41
2005/06	11.96	400.62	412.58	60.43
2006/07	19.58	239.48	259.06	-37.21
2007/08	14.02	314.12	328.14	26.67
2008/09	14.82	293.76	308.58	-5.96
2009/10	11.8	473.15	484.95	57.15
2010/11	13.16	476.25	489.41	0.92
2011/12	9.41	355.77	365.18	-25.38
2012/13	14.08	443.32	457.40	25.25

Source: Department of Mines & Department of Customs

Table 2.12 : Consumption of Petroleum Products in Nepal, 2000/01-2012/13

Year	Petrol (kl)	High Speed Diesel(kl)	Kerosene Oil (kl)	Llight Diesel Oil (kl)	Furnace Oil (kl)	Aircraft Turbine Oil (kl)	L.P. Gas (mt)
2000/01	59245	326060	316381	3416	20934	63131	40102
2001/02	63271	286233	386592	2413	18255	47453	48757
2002/03	67457	299973	348620	610	14496	52839	56079
2003/04	67586	299730	310826	577	12653	64041	66142
2004/05	75989	315368	239328	88	2696	66825	77594
2005/06	80989	294329	226637	290	3695	64335	81005
2006/07	101912	306687	197850	179	4558	63778	93562
2007/08	100842	302706	155216	306	2919	68938	96837
2008/09	124169	446468	70089	377	2171	68935	115813
2009/10	162275	612505	55788	238	2589	82631	141171
2010/11	187641	655128	49495	227	1415	101314	159286
2011/12	199749	648513	41808	0	435	109808	181411
2012/13	221676	716747	24721	258	2450	115786	207038

Sourec : Nepal Oil Corporation, 2014

Table 2.13 : Energy Consumption by Sector, 2001/02-2011/012

Sector	Year									
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2011/12
Residential	7381.58	7512.13	7654.50	7778.20	7921.48	8103.48	8239.74	8364.02	8568.36	7094.97
Industrial	294.15	280.83	321.80	299.41	395.10	300.11	328.21	312.23	437.56	696.83
Transport	282.12	298.04	308.11	325.99	351.51	377.93	352.79	538.58	700.09	628.79
Commercial	115.46	122.66	124.73	125.17	89.72	72.15	114.63	70.53	77.46	302.66
Agriculture	65.14	67.76	67.84	72.37	67.77	70.64	59.14	85.54	108.16	103.23
Others	10.66	11.36	12.51	14.35	14.64	15.96	17.79	17.25	19.40	-
Total	**8149.11**	**8292.78**	**8489.49**	**8615.49**	**8840.22**	**8940.27**	**9112.30**	**9388.15**	**9911.03**	**8826.48**

Source: Water and Energy Commission Secretariat.

Table 2.14 : Energy Consumption by Sector and Type, 2001/02-2012/13

('000 TOE)

category		Year										
	Fuel type	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2011/12*	2012/13
Traditional	Fuel wood	6315.03	6451.17	6590.26	6732.71	6861.77	6999.37	7149.43	7300.67	7458.48	6274.15	7152.535
	Agri. residue	305.61	312.67	319.91	327.62	328.63	337.17	336.91	344.54	354.57	310.30	353.7466
	Animal dung	466.92	476.73	486.74	496.96	507.40	518.05	528.93	540.04	551.38	448.41	511.1869
	Total	**7087.56**	**7240.57**	**7396.91**	**7557.29**	**7697.80**	**7854.59**	**8015.27**	**8185.25**	**8364.43**	**7032.87**	**8017.47**
Commercial	Coal	152.06	134.24	171.09	151.55	243.16	144.49	193.40	181.87	292.89	347.86	415.1066
	Electricity	118.86	127.48	140.17	156.57	163.53	179.68	190.06	182.29	219.89	247.69	257.1665
	LPG	56.33	64.79	76.41	89.64	93.58	108.09	111.87	133.80	163.09	209.62	239.1866
	Kerosene	328.89	296.59	264.43	203.15	192.81	168.32	132.05	59.63	47.46	35.57	20.47304
	Gasoline	49.72	53.00	53.40	59.44	63.64	80.08	79.24	97.57	127.51	156.75	175.2904
	High speed Diesel	254.72	266.95	266.74	279.45	261.93	272.93	269.38	415.12	545.08	577.12	641.81
	Light diesel oil	2.21	0.56	0.54	0.08	0.27	0.16	0.28	0.35	0.22	0.00	0.00
	Fuel oil	13.56	12.99	9.89	-0.65	0.03	1.24	0.64	0.00	0.00	0.42	2.79
	Air turbine fuel	40.27	44.48	54.35	56.71	54.60	54.12	58.50	58.50	70.12	93.19	98.35
	Other Petroleum	12.25	13.80	15.55	17.52	19.74	22.24	2.92	9.61	10.25	10.21	4.50
	Total	**1028.87**	**1014.88**	**1052.57**	**1013.46**	**1093.29**	**1031.35**	**1038.34**	**1138.74**	**1476.51**	**1678.42**	**1854.67**
Renewable	Biogas	31.68	35.82	38.72	43.35	47.56	52.13	55.94	60.84	66.04	101.55	158.6451
	Micro-hydro	0.98	1.11	1.24	1.34	1.53	2.12	2.64	3.19	3.89	6.87	7.24331
	Solar	0.02	0.04	0.05	0.06	0.07	0.07	0.10	0.13	0.15	0.02	0.021272
	Total	**32.68**	**36.97**	**40.01**	**44.75**	**49.16**	**54.32**	**58.68**	**64.16**	**70.08**	**108.44**	**165.91**
Grand Total		**8149.11**	**8292.42**	**8489.49**	**8615.50**	**8840.25**	**8940.26**	**9112.29**	**9388.15**	**9911.02**	**8819.73**	**10038.05**

** Survey data, WECS*

Source: Water and Energy Commission Secretariat

Table 2.15 : Annual Production of Improved Seeds

(mt.)

Seeds	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Paddy	353	493.51	559.95	643.78	661.17	885.95	931.15	950.97	1209.1	1200.46	774
Wheat	1680	1666.76	2237.33	2859.24	2450.7	2878.54	2989.79	3554.58	2982.56	2180.93	2877.23
Maize	20	17.34	1.54	10.69	5.8	0.64	4	0.05	0.84	0	0.34
Vegetable	2.3	0.35	2.35	2.77	8.38	16	5.1	6.75	0.75	2.92	0.12
Lentil	17	12.64	15.08	21.9	26.01	4.96	11.53	6.25	12.73	8.58	17
Jute	4	1.21	6.08	5.25	1.59	1.48	2.75	1.12	0	0	0
Mustard	0.9	0.04	1.03	5.88	4.34	1.02	1.55	1.54	3.02	1.76	2
Others	0	0.432	1.6	1.64	0	0.4	0	0.51	2.02	0.2	0.22
Total	2077.2	2192.3	2825	3551.2	3158	3789	3945.9	4521.8	4211.02	3394.85	3670.9

Source : National Seed Company Ltd.

Table 2.16 : Crop Species Registered in Nepal

Crops Species	Number of Species Registered										
	1997*	2002+	2003+	2004	2005	2006	2007	2008	2009	2010	2013
Cereal crops											
Paddy		48	48	49	49	55	44	44	44	48	74
Maize		17	15	17	17	19	12	14	16	16	51
Wheat		28	28	29	29	30	17	17	19	20	22
Barley		6	6	6	6	6	6	6	6	6	6
Millet		3	3	3	3	3	3	3	3	3	3
Total	**92**	**102**	**100**	**104**	**104**	**113**	**82**	**84**	**88**	**93**	**156**
Leguminous											
Leguminous and Pulse	17	25	25	28	27	31	22	22	33	33	35
Vegetables	22	44	44	46	46	44	44	44	46	46	333
Oil Crops	10	12	12	16	16	16	15	15	15	15	17
Total	**49**	**81**	**81**	**90**	**89**	**91**	**81**	**81**	**94**	**94**	**385**
Others(Jhuse Til)											1
Grass crops										2	5
Total										**2**	**6**
Industrial/Cash Crops											
Jute		2	2	2	2	2	2	2	2	2	2
Ginger		1	1	1	1	1	1	1	1	1	1
Sugarcane	2	2	2	4	4	4	4	4	4	4	4
Tobacco	1	1	1	1	1	1	1	1	1	1	1
Cotton/Fiber Crops	-	1	1	1	1	1	1	1	1	1	1
Total	**3**	**7**	**7**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
Grand Total	153	190	188	203	209	220	179	93	97	198	556

**Nepal Gazette vol.47, No. 11 (1997).+Updated Registration List of the Pesticide.*

Source: Nepal Agriculture Research Council and National Seed Board.

Table 2.17 : Maximum Residual Limits (MRL) of Pesticides in Foodstuffs

Pesticides	Max. Residual Limit (MRL)	Pesticides	Max. Residual Limit (MRL)
Aldrin, Dieldrin	0.01 mg/kg	DDT	Absent
Chlordane	0.02 mg/kg	Dichlorvos	1 mg/kg
Diazinon	0.05 mg/kg	Fenitrothion	0.02mg/kg
	37.05 mg/kg	Hydrogen Phosphide	.02 mg/kg
Hydrogen Cyanide	0.01 mg/kg	Inorganic Bromide	25 mg/kg
	4.00 mg/kg	Lindane	.01 mg/kg
Malathion	0.01 mg/kg	Phosphamidon	.05 mg/kg
Fenithion	0.10 mg/kg	Carbofuran	.10 mg/kg
Phenthoate	0.05 mg/kg	Dithiocarbamates	.20 mg/kg
Carbendazim	0.50 mg/kg	Phorate	.05 mg/kg
Oxydemeton methyl	0.02 mg/kg	Trichlorfon	.05mg/ kg
Paraquat dichloride	0.025 mg/kg	Decmethrin/ Deltamethrin	.50mg/kg
Chlorphyrifos	0.05 mg/kg	Monocrothphos	.025 mg/kg
Chlorfenvinphos	0.025 mg/kg	Prethrins	Absent
Carbaryl	1.5mg/kg		

Source : Nepal Gazette 5 Feb 2001

Table 2.18 : Small Scale Manufacturing Establishments by Region and Rural-Urban Area

Region	No. of Establishments			Changed Number	
	1991/92	1999/00	2009/10	(1999/00-1991/92)	(2009/10-1999/00)
Development Region					
Eastern	11635	11639	8701	4	-2938
Central	21414	21170	14456	-244	-6714
Western	6047	5448	5074	-599	-374
Mid western	5057	2852	2677	-2205	-175
Far western	2265	2562	1418	297	-1144
Rural-urban				0	
Rural	11488	13926	20002	2438	6076
Urban	34930	29745	12324	-5185	-17421
Nepal	**46418**	**43671**	**32326**	**-2747**	**-11345**

Source: Central Bureau of Statistics (Surveys of Small Manufacturing Establishments).

Table 2.19 : Manufacturing Establishments by Region and Rural-Urban Area

Area	No. of Establishments				
	1991/92	1996/97	2001/02	2006/07	2011/12
Development Region					
Eastern	749	704	825	819	1081
Central	2747	2019	1496	1618	1433
Western	439	519	583	612	955
Mid western	17	182	153	190	376
Far western	159	133	156	207	231
Rural-urban					
Rural	1478	1594	1615	1871	2470
Urban	2633	1963	1598	1575	1606
Nepal	**4111**	**3557**	**3213**	**3446**	**4076**

Source: Central Bureau of Statistics (Censuses of Manufacturing Establishments).

Table 2.20 : Summary of Fish Production in Nepal, 2012/13

S.N.	Particulars	No. of Pond	Area (ha.)	Production (kg.)	Yield (kg./ha.)
Fish Production from Aquaculture Practices					
1	Pond Fish Culture				
	Mountain	85	5	9000	1800
	Hill	1940	210	440000	2095
	Tarai	29995	7805	30772000	3943
	Total	**32020**	**8020**	**31221000**	**3893**
2	Other area (ghols)		2700	4050000	1500
3	Paddycum fish culture(ha)		100	45000	450
4	Cage fish culture(m3)		60000	360000	
5	Enclosure fish culture(ha)		100	140000	1400
6	Trout Fish Culture in Raceway(m2)		10000	180000	
7	Fish Production in Public Sector			24000	
Fish Production from Capture Fisheries					
8	Rivers		395000	7110000	18
9	Lakes		5000	850000	170
10	Reservoirs		1500	385000	257
11	Marginal/ Swamps / Ghols etc.		11100	5990000	540
12	Irrigated Paddy Fields		398000	7165000	18
Total Fish Production				**57520000**	

Source : Directorate of Fisheries Development

Table 2.21 : Environment Protection Expenditure of Nepal

(Rs. million)

Economic Accounts and Environmental Transaction					
Sectors	**Years**				
	2006/07	**2007/08**	**2008/09**	**2009/10**	**2010/11R**
Corporation (Financial Non-financial Corporation)	321.68	339.56	370.03	388.06	405.17
Government	4631.31	7075.67	8803.58	8765.89	10047.01
Household	311.69	314.89	318.13	321.40	341.43
NPISH	3111.99	3111.99	3435.36	3602.80	3761.57
Total Expenditure	8376.66	10842.11	12927.09	13078.15	14555.18
GDP at Current Price	727827	815658	988272	1193679	1369430
Environment Expenditure as percent of GDP (at Current Price)	**1.15**	**1.33**	**1.31**	**1.10**	**1.06**

R = Revised,

Sources :Central Bureau of Statistics (Environment Statistics Section,Preliminary Report)

Chapter III

Social and Demographic Issues

Table 3.1 : Social and Demographic Indicators

Parameter	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Socio-economic Indicators													
Literacy Rate	54.1*			50.6							65.9**		
Male	65.5*			63.5							75.1**		
Female	42.8*			38.9							57.4**		
Adult literacy Rate (15+)	49.2			48							59.57		
Male	62.7			64.5							71.6		
Female	34.9			33.8							48.78		
Labor force participation rate (LFPR)								83.4					81.1
Male participation (%)						48.9		87.5					85.6
Female participation (%)						68.6		80.1					77.5
Households with access to improved sources of drinking piped water (%)	52.9		14.4								83.0		
Households with toilet facility (%)	46.1		38.7								56		
Households with access to electricity (%)	39.4										69.9		
Households with radio facility (%)	53.1										50.8		
Households using firewood for cooking (%)	65.6			83.7							64		
Households with telephone (%)	12.5										7.4		
Mobile Phone											64.6		
Demographic Indicators													
Crude birth rate (per 1000 popn)	33.6	33.1	31.28		30.62	30	29.2	27.7			24.3		
Crude death rate (per 1000 popn)	9.62	9.6	9.22		8.96	8.7	8.5	8.3					
Total fertility rate (per women)		4.1	3.7		3.6	3.5					2.6		
Urban		2.1									1.6		
Rural		4.4									2.8		
Infant mortality rate (per 1000 live births)	65.3	64.4					48			48	46		
Urban											38		
Rural											55		
Child mortality rate (per 1000 live births)	105.4	91.2					61			61	54		
Urban											45		
Rural											64		
Life expectancy at birth (yrs)	60.8	59.7	62.2		62.8	63	63.7	64.1			68.8		69.1
Male	60.8		61.76		62.3	62.9	63.3	63.6					
Female	61		62.5		63.1	63.7	64.1	64.5					
Annual population growth rate	2.25										1.35		
Maternal mortality rate (per 1000 live births)		415					281				229		
Median age of population		20.1											
Male		19.7											
Female		20.5											
Currently use contraception % (any methods 15-49)	39.3					48					49.7		
Mean age at marriage													
Male		21.9											
Female		19.5											
Abortion											7.5		
Urban											14.7		
Rural											6.7		
Other Indicators													
HDI (Human development index)	0.401				0.429	0.527	0.44					0.49***	
HPI (Human poverty index)	39.6											31.12	
GDI (Gender related index)	0.452					0.452	0.52		0.545			0.482***	
GEM (Gender Empowerment Measurement)						0.351	0.351		0.486			0.568	

* 6 years and above population *** using geometric mean ** 5 years and above population

Source : NPC,CBS, Department of Health Services,Nepal Demographic and Health Survey,Nepal Human Development Report, 2014

Table 3.2 : Population Distribution and Composition, 1971-2011

(population in %)

Population Distribution	1971	1981	1991	2001	2011
Nepal (Number of Population)	**11554983**	**15022839**	**18491097**	**23151423**	**26494504**
Ecological belt					
Mountain	9.9	8.7	7.8	7.29	6.73
Hill	52.5	47.7	45.5	44.28	43.01
Tarai	37.6	43.6	46.7	48.43	50.27
Residence					
Rural	96	93	91	86	82.93
Urban	4	7	9	14	17.07
Development					
Eastern	24	24	24	23	21.93
Central	33	33	34	35	36.45
Western	21	21	20	20	18.60
Mid-western	13	13	13	13	13.39
Far western	9	9	9	9	9.63
Total	**100**	**100**	**100**	**100**	**100**
Population composition					
By age					
0-14	40	41	42	39	34.91
15-59	54	53	52	54	56.96
60-+	6	6	6	7	8.13
Total	**100**	**100**	**100**	**100**	**100**
By sex					
Male	50.34	51.22	49.87	49.95	48.5
Female	49.66	48.78	50.13	50.05	51.5
Sex ratio	101.4	105	99.5	99.8	94.2
By caste/ethnic group					
Chhetri			16.1	15.3	16.6
Bramhin			13.8	12.7	12.2
Magar			7.2	7.1	7.1
Tharu			6.7	6.8	6.6
Tamang			5.5	5.6	5.8
Newar			5.6	5.5	5
Muslim			4.1	4.2	4.4
Others			40.9	42.7	42.3
Total			**100**	**100**	**100**
By literacy					
Male		34	54	65.5	75.1
Female		12	25	42.8	57.4
Total		**23.3**	**39.6**	**54.1**	**65.9**

Table 3.2 : Population Distribution and Composition, 1971-2011

(contd...)

(population in %)

Population Distribution	1971	1981	1991	2001	2011
By religion					
Hindu		90	86	81	81.3
Baudha		5	8	11	9
Islam		3	4	4	4.4
Others		2.5	2.1	4	5.3
By Mother Tongue					
Nepali		58	50	48.6	44.6
Maithali		11.1	11.8	12.3	11.7
Bhojpuri		7.6	7.5	7.5	6
Tharu		3.6	5.4	5.8	5.8
Tamang		3.5	4.9	5.2	5.1
Newar		3	3.5	3.6	3.2
Others		13.2	16.9	17	23.6
By employment status					
Employer				3.81	2.15
Employee				24.63	27.47
Self employed				62.73	65.82
Unpaid family worker				8.83	1.33
Not stated					3.24
By occupation					
Agriculture		91.4	81.1	65	60.43
Non- agriculture		6.3	18.6	35	37.54
Not stated		2.3	0.3	0	2.03
Occupational classifications					
Manager / Administrator / Legislator		0.1	0.3	0.6	1.41
Professional		0.9	1.8	2.5	3.99
Technician				1.7	2.09
Clerks/office assistance		0.7	1.1	2.03	1.27
Service worker		1.5	9.2	7.9	8.29
Agriculture / livestock / forestry / fisheries		92.2	81.2	65.7	60.43
Craft production worker				9.3	8.07
Plant production worker				1.4	2.22
Elementary				8.8	9.94
Armed force					0.24
Not stated					2.03

Source: Central Bureau of Statistics (National Population Censuses 1971,1981,1991,2001 and 2011).

Table 3.3 : Population and Household

S.N.	Description	1961	1971	1981	1991	2001	2011
1	Population ('000)	9412	11556	15023	18491	23151	26494
2	Average annual population growth rate	1.64	2.05	2.62	2.08	2.25	1.35
3	Number of households	1738975	2084062	2585154	3328198	4253220	5427302
4	Average household size	5.3	5.5	5.8	5.6	5.44	4.88

Source : Central Bureau of Statistics

Table 3.4 : Poverty Head Count Rate

S.N.	Region	Poverty Head count Rate			Distribution of the Poor		
		1995/96	2003/04	2010/11	1995/96	2003/04	2010/11
1	**Development Region**						
	Eastern	38.9	29.3	21.44	21	23.4	19.8
	Central	32.5	27.1	21.69	26.9	32.2	30.8
	Western	38.6	27.1	22.25	18.7	16.7	16.9
	Mid Western	59.9	44.8	31.68	18.5	17.7	16.4
	Far Western	63.9	41	45.61	14.8	9.9	16.0
2	**Ecological Belt**						
	Mountain	57	32.6	42.27	10.7	7.5	11.8
	Hill	40.7	34.5	24.32	41.9	47.1	42.8
	Tarai	40.3	27.6	23.44	47.4	45.4	45.4
3	**Residence**						
	Urban	21.6	9.6	15.46	3.6	4.7	11.7
	Rural	43.3	34.6	27.43	96.4	95.3	88.3
4	**Nepal**	**41.8**	**30.8**	**25.16**	**100**	**100**	**100**

Source : Central Bureau of Statistics (Nepal Living Standard Surveys,1995/96, 2003/04, 2010/11)

Table 3.5 : Poverty Gap in Rural and Urban, Nepal

	Year	Urban	Rural	Nepal
Poverty Gap Index	1995/96	6.54	12.14	11.75
	2003-04	2.18	8.5	7.55
	2010/11	3.19	5.96	5.43
	1995/96-2003/04 Change (%)	-66.67	-29.98	-35.74
	2003/04-2010/11Change (%)	46.33	-29.88	-28.08
Squared Poverty Gap Index	1995-96	2.65	4.83	4.67
	2003-04	0.71	3.05	2.7
	2010/11	1.01	2.00	1.81
	1995/96-2003/04 Change (%)	-73.21	-36.85	-42.18
	2003/04-2010/11Change (%)	42.25	-34.43	-32.96

Source : Central Bureau of Statistics (Nepal Living Standard Surveys,1995/96 , 2003/04 and 2010/011).

Table 3.6 : Status of Calorie Consumption and Malnutrition

(proportion)

Region	Calorie Intake Shortfall (k_0)		Stunting (S_o)<5 age		Underweight (U_o) <5 age		Wasting (W_o) <5 age	
	NLSS-II 2003/04	Small Area Estimation CBS	Nepal Demographic and Health Survey 2006	Small Area Estimation CBS	Nepal Demographic and Health Survey 2006	Small Area Estimation CBS	Nepal Demographic and Health Survey 2006	Small Area Estimation CBS
Development Region								
Eastern	0.364	0.376	0.439	0.476	0.408	0.434	0.079	0.091
Central	0.362	0.399	0.519	0.5	0.516	0.447	0.124	0.108
Western	0.267	0.372	0.498	0.501	0.436	0.434	0.068	0.089
Mid-western	0.418	0.443	0.515	0.539	0.473	0.49	0.073	0.088
Far-western	0.377	0.499	0.530	0.540	0.543	0.489	0.114	0.088
Ecological Belt								
Mountain	0.400	0.452	0.586	0.614	0.473	0.451	0.062	0.053
Hill	0.371	0.418	0.523	0.524	0.433	0.414	0.051	0.059
Tarai	0.330	0.374	0.465	0.473	0.504	0.484	0.134	0.133
Residence								
Urban	0.426	0.416	0.363	0.368	0.331	0.335	0.085	0.078
Rural	0.339	0.395	0.506	0.522	0.483	0.467	0.096	0.98
Nepal	**0.352**	**0.398**	**0.497**	**0.504**	**0.473**	**0.452**	**0.095**	**0.096**

Nutrition Status	DHS 2001^	DHS 2006^	DHS 2011^	NLSS- III 2010/11*
Stunting (So)<5 age %	57	49	41	41.5
Underweight (Uo) <5 age %	43	39	29	31.1
Wasting (Wo) <5 age %	11	13	11	13.7

*Source : * Central Bureau of Statistics (Nepal Living Standard Surveys, 2003/04).^ Demographic Health Surveys*

Table 3.7 : Percentage Distribution of Boys and Girls Enrolled in Different levels of Schools

(In Percent)

Years	Girls /Boys	Pre -primary	Primary (1-5)	Lower Secondary (6-8)	Secondary (9-10)	Higher Secondary (11-12)
2001	Girls	44.5	44.8	42.2	41.4	
	Boys	55.5	55.2	57.8	58.6	
2002	Girls	44.7	45.4	42.9	42.9	
	Boys	55.3	54.6	57.1	57.1	
2003	Girls	44.2	45.4	43.6	43.8	
	Boys	55.8	54.6	56.4	56.2	
2004	Girls	46.0	46.3	45.2	44.6	
	Boys	54.0	53.7	54.8	55.4	
2005	Girls	46.2	47.4	45.7	45.8	
	Boys	53.8	52.6	54.3	54.3	
2006	Girls	47.8	48.3	46.6	46.1	
	Boys	52.2	51.7	53.4	53.9	
2007	Girls	46.0	48.9	47.1	46.0	
	Boys	54.0	51.1	52.9	54.0	
2008	Girls	49.4	49.5	48.2	47.2	
	Boys	50.6	50.5	51.8	52.8	
2009	Girls	47.6	50.1	49.0	48.1	51.3
	Boys	52.4	49.9	51.0	51.9	48.7
2010	Girls	48.0	50.4	49.9	48.8	48.8
	Boys	52.0	49.6	50.1	51.2	51.2
2011	Girls	72.1	50.4	50.5	49.7	51.2
	Boys	73.6	49.6	49.5	50.3	48.8
2012	Girls	48.1	50.5	50.9	49.8	50.5
	Boys	51.9	49.5	49.1	50.2	49.5

Source : Department of Education (School Level Educational Statistics at a Glance).

Table 3.8 : Gross Enrolment Rate (GER) in Different Levels of Schools

Year	Boys / Girls	Gross Enrolment Ratio (GER)				
		Pre Primary	Primary	Lower Secondary	Secondary	Higher Secondary
			(1-5)	(6-8)	(9-10)	(11-12)
2001	Total	12.8	124.7	63.2	43.8	
	Girls	11.7	114.7	54	36	
	Boys	13.8	134.1	72.2	51.8	
2002	Total	19.8	118.4	57.5	44.8	
	Girls	17.6	109.4	51.2	38.7	
	Boys	22	127.1	63.4	50.7	
2003	Total	20.1	126.7	60	46.4	
	Girls	NA	117.1	54.3	41.3	
	Boys	NA	136	65.2	51.5	
2004	Total	39.4	130.7	80.3	50.4	
	Girls	37.3	124.2	73.9	45.2	
	Boys	41.4	137	86.4	55.4	
2005	Total	69.9	145.4	76	59.3	
	Girls	66.6	141.8	68.2	45.5	
	Boys	73.1	148.8	84	53	
2006	Total	41.4	138.8	71.5	56.7	
	Girls	40.9	138.4	65.4	53.1	
	Boys	41.9	139.2	77.9	60.2	
2007	Total	60.2	138.5	78.8	55.9	
	Girls	56.8	139.6	75.9	52.4	
	Boys	63.4	137.6	81.6	59.3	
2008	Total	49.7	142.8	80.1	59.5	
	Girls	48.6	145.6	81.1	61.6	
	Boys	50.7	140.2	79.0	57.3	
2009	Total		141.4	88.7	65.7	23.6
	Girls		146.1	89.3	64.5	24.6
	Boys		137.1	88.2	66.8	22.6
2010	Total	70	139.5	94.5	66.3	26.0
	Girls	69.2	144.8	97.0	66.5	26.9
	Boys	70.9	134.5	92.1	66.1	25.2
2011	Total	72.9	135.9	100.0	70.1	28.9
	Girls	72.1	141.2	104.1	71.9	30.2
	Boys	73.6	131	96.0	68.4	27.6
2012	Total	73.7	130.1	100.6	71.7	31.6
	Girls	73.1	132.7	105.5	73.6	32.6
	Boys	74.3	127.5	96.1	69.9	30.7

Source : Department of Education (School Level Educational Statistics at a Glance).

Table 3.9 : Net Enrolment Rate (NER) in Different Levels of Schools 2001-2012.

(In percentage)

Year	Boy / Girl	Net Enrolment Ratio (NER)			
		Primary	Lower Secondary	Secondary	Higher Secondary
		(1-5)	(6-8)	(9-10)	(11-12)
2001	Total	81.1	39.4	25.5	
	Girls	75.1	33.7	20.9	
	Boys	86.9	45	30.2	
2002	Total	82.3	40.4	27.5	
	Girls	76.8	35.8	23.9	
	Boys	88.7	44.7	31	
2003	Total	83.5	42.9	29.5	
	Girls	77.5	38.7	26.3	
	Boys	89.4	46.8	32.7	
2004	Total	84.2	43.9	32	
	Girls	78	40.2	28.8	
	Boys	90.1	47.6	35.2	
2005	Total	86.8	46.5	32.4	
	Girls	83.4	43.1	29.2	
	Boys	90.1	49.8	35.5	
2006	Total	87.4	52.3	34.7	
	Girls	85.5	47.8	32.4	
	Boys	89.3	57.1	37	
2007	Total	89.1	52.9	35.3	
	Girls	87.4	49.6	32.8	
	Boys	90.7	56.1	37.7	
2008	Total	91.9	57.3	36.4	
	Girls	90.4	56.6	35.0	
	Boys	93.2	58.0	37.8	
2009	Total	93.7	63.2	40.8	6.6
	Girls	92.6	61.9	40.1	6.8
	Boys	94.7	64.3	41.4	6.8
2010	Total	94.5	69.3	46.5	7.8
	Girls	93.6	68.5	45.9	7.9
	Boys	95.3	70.0	47.0	7.6
2011	Total	95.1	70.0	52.1	9.4
	Girls	94.5	69.5	51.4	9.7
	Boys	95.6	70.5	52.7	9.1
2012	Total	95.3	72.2	54.3	10.4
	Girls	94.7	71.8	54.0	10.6
	Boys	95.9	72.6	54.6	10.2

Source: Department of Education (School Level Educational Statistics at a Glance).

Table 3.10 : Inter-Zonal Life-Time Migrants, Nepal, 1971-2001

Year	Place of Birth	Place of Enumeration				% Out-Migration	Net-Migration
		Mountain	Hill	Tarai	Total		
1971	Mountain	-	15667	33990	49657	11.1	-39959
	Hill	9258	-	376074	385332	86.6	-359966
	Tarai	440	9699	-	10139	2.3	399925
	Total	**9698**	**25366**	**410064**	**445128**	**100.0**	
	% In-migration	**2.2**	**5.7**	**92.1**	**100.0**		
1981	Mountain	-	134,254	162,832	297,086	32	-261,467
	Hill	33,423	-	561,211	594,634	64	-424,711
	Tarai	2,196	561,211	-	37,865	4.1	686,178
	Total	**35,619**	**169,923**	**724,043**	**929,585**	**100.0**	
	% In-migration	**3.8**	**18.3**	**77.9**	**100.0**		
1991	Mountain	-	76,503	121,826	198,329	16.1	-161,655
	Hill	32,003	-	895,888	927,891	75.5	-753,923
	Tarai	4,671	97,465	-	102,136	8.3	915,578
	Total	**36,674**	**173,968**	**1,017,714**	**1,228,356**	**100.0**	
	% In-migration	**3.0**	**14.2**	**82.9**	**100.0**		
2001	Mountain	-	125597	169825	295422	17.1	-255103
	Hill	33895	-	1157035	1190930	68.9	-830759
	Tarai	6424	234574	-	240998	14	1085862
	Total	**40319**	**360171**	**1326860**	**1727350**	**100.0**	
	% In-migration	**2.3**	**20.9**	**76.8**	**100.0**		

Source : Central Bureau of Statistics(Population Monograph of Nepal ,2003 vol II)

Table 3.11 : Inter-Zonal Migrants for Both Sexes, Nepal, 2001

Origin	Destination				% Out-Migration	Net-Migration
	Mountain	Hill	Tarai	Total		
Nepal						
Mountain	-	125,597	169,825	295,422	17.1	-255,103
Hill	33,895	-	1,157,035	1,190,930	68.9	-830,759
Tarai	6,424	234,574	-	240,998	14	1,085,862
Total	**40,319**	**360,171**	**1,326,860**	**1,727,350**	**100**	
% In-migration	**2.3**	**20.9**	**76.8**	**100**		
						Male
Mountain	-	57,170	84,783	141,953	16.8	-127,610
Hill	10,822	-	567,513	578,335	68.4	-400,001
Tarai	3,521	121,164	-	124,685	14.8	527,611
Total	**14,343**	**178,334**	**652,296**	**844,973**	**100**	
% In-migration	**1.7**	**21.1**	**77.2**	**100**		
						Female
Mountain	-	68,428	85,040	153,468	17.4	-127,511
Hill	23,061	-	589,528	612,589	69.4	-430,746
Tarai	2,896	113,415	-	116,311	13.2	558,257
Total	**25,957**	**181,843**	**674,568**	**882,368**	**100**	
% In-migration	**2.9**	**20.6**	**76.4**	**100**		

Source : Central Bureau of Statistics(Population Monograph of Nepal ,2003 vol II)

Table 3.12 : Statistics on Crime, Corruption, Traffic Accidents in Nepal, 2001/02-2012/13

Cases	Year											
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Crime (Case Number)*	29867	36763	26586	9320	11,329	10413	11672	NA	16753	19575	21577	22632
Corruption (Case Number)+	2522	3966	3732	4759	4324	3564	2732	4149	4295	6145	8839	11298
Traffic Accident*	NA	4030	5532	3868	4545	916	1483	5519	7438	8803	8892	8484

*Source : * Police Headquarter*
+ Commission for Investigation Abuse Authority.

Table 3. 13 : Number of Hard Drug Users by Sex, Nepal, 2012

Area	Number of current hard drug users by sex					
	2012			2006		
	Total	Male	Female	Total	Male	Female
Kathmandu Valley	36998	33513	3485	17458	15580	1878
Sunsari	7407	6956	451	3186	2854	332
Kaski	6917	6414	503	5112	4794	318
Morang	6415	6228	187	1316	1266	50
Jhapa	6008	5764	244	3523	3378	145
Rupandehi	5997	5750	247	2587	2454	133
Chitawan	4515	4151	364	2071	1880	191
Banke	4050	3876	174			
Parsa	2130	1993	137	1301	1212	89
Makawanpur				481	462	19
Others	11097	10559	538	9274	9074	200
Total	**91534**	**85204**	**6330**	**46309**	**42954**	**3355**

Source : Central Bureau of Statistics (Survey on Hard Drug Users in Nepal, 2006,2012)

Table 3.14 : Number of Environment Related NGOs and INGOs Affiliated with Social Welfare Council

S.N.	District	NGOs					S.N.	District	NGOs				
		2003/4	2004/5	2007/8	2008/9	2012/13			2003/4	2004/5	2007/8	2008/9	2012/13
1	Taplejung	3	3	4	4	5	39	Syangja	6	6	6	6	8
2	Panchthar	8	9	4	4	5	40	Kaski	29	35	40	41	43
3	Ilam	5	5	6	6	6	41	Manang	0	0	0	0	0
4	Jhapa	14	16	16	17	19	42	Mustang	0	1	1	1	1
5	Morang	16	18	17	17	21	43	Myagdi	2	2	3	4	4
6	Sunsari	15	15	18	19	21	44	Parbat	7	8	8	9	9
7	Dhankuta	1	1	2	3	3	45	Baglung	4	4	4	4	4
8	Terhathum	1	2	3	3	3	46	Gulmi	6	6	6	6	8
9	Sankhuwasabha	1	1	1	1	1	47	Palpa	8	9	11	12	13
10	Bhojpur	2	2	2	2	2	48	Nawalparasi	10	12	13	16	18
11	Solukhumbu	2	2	3	3	3	49	Rupandehi	2	3	18	18	20
12	Okhaldhunga	3	3	3	3	3	50	Kapilbastu	6	7	8	8	9
13	Khotang	2	2	2	2	2	51	Arghakhanchi	2	2	5	5	5
14	Udayapur	1	2	4	4	4	52	Pyuthan	2	2	2	2	3
15	Saptari	14	14	14	16	21	53	Rolpa	1	1	2	2	2
16	Siraha	7	9	11	11	13	54	Rukum	0	0	1	2	2
17	Dhanusa	8	9	12	14	15	55	Salyan	8	8	9	9	9
18	Mahottari	6	7	9	9	9	56	Dang	16	18	21	24	34
19	Sarlahi	3	4	6	9	11	57	Banke	15	18	19	20	21
20	Sindhuli	19	20	11	11	12	58	Bardiya	18	18	28	20	20
21	Ramechhap	3	3	4	4	4	59	Surkhet	21	23	13	13	15
22	Dolakha	10	11	10	10	11	60	Dailekh	3	3	6	6	9
23	Sindhupalchok	10	12	9	9	9	61	Jajarkot	1	1	1	1	3
24	Kavre	7	9	14	14	17	62	Dolpa	3	4	4	4	5
25	Lalitpur	35	38	61	66	78	63	Jumla	1	1	1	1	2
26	Bhaktapur	7	7	8	9	10	64	Kalikot	7	8	8	9	13
27	Kathmandu	391	429	481	503	562	65	Mugu	2	2	7	8	10
28	Nuwakot	4	5	5	6	9	66	Humla	2	2	2	2	3
29	Rasuwa	1	1	1	2		67	Bajura	2	2	3	3	3
30	Dhading	9	10	11	11	15	68	Bajhang	3	5	7	7	7
31	Makwanpur	12	13	15	18	20	69	Achham	4	5	8	8	10
32	Rautahat	2	6	10	11	15	70	Doti	5	5	6	6	8
33	Bara	6	9	10	13	13	71	Kailali	15	16	21	28	32
34	Parsa	6	8	8	8	13	72	Kanchanpur	12	16	23	27	28
35	Chitawan	37	41	41	41	46	73	Dadeldhura	3	3	5	5	5
36	Gorkha	9	10	11	11	11	74	Baitadi	2	2	5	5	6
37	Lamjung	10	11	13	13	13	75	Darchaula	1	3	4	4	4
38	Tanahu	7	7	7	7	10		**Total**	**926**	**1035**	**1196**	**1260**	**1431**
INGOs													
1	Lalitpur	0	0	0	3	NA	2	Kathmandu	3	3	3	4	NA
								Total	**3**	**3**	**3**	**7**	

Source: Social Welfare Council

Table 3.15 : Percentage distribution of labour underutilization (15 years and older)

Labour Underutilization Rate (in percent)							
	Unemployment Rate	Time Related Underemployment	Skill Missmatched	Inadequate Earnings	Labour Underutilization Rate	Employed Others	Total
	(1)	(2)	(3)	(4)	(5)=(1)+(2)+(3)+(4)	(6)	(7)
Sex							
Male	3.2	13.9	4.9	11.0	32.9	67.1	100.0
Female	3.4	13.0	3.6	3.3	23.4	76.6	100.0
Urban/Rural							
Urban	8.0	9.5	5.9	17.1	40.5	59.5	100.0
Rural	2.5	14.1	3.9	5.1	25.6	74.5	100.0
Literacy							
Literate	4.1	13.5	7.0	9.7	34.3	65.7	100.0
Not literate	2.1	13.3	0.0	2.7	18.1	81.9	100.0
Age Group							
15 -- 24	5.9	13.8	10.4	5.7	35.8	64.2	100.0
25 -- 44	3.3	13.4	3.1	9.7	29.5	70.5	100.0
45 +	1.3	13.1	0.7	4.2	19.3	80.7	100.0
Consumption quintiles							
Lowest (First)	2.2	14.5	3.5	5.1	25.3	74.7	100.0
Second	1.9	14.2	3.8	5.5	25.4	74.7	100.0
Middle	2.7	16.0	4.0	4.1	26.7	73.3	100.0
Fourth	3.3	12.0	4.4	6.8	26.5	73.6	100.0
Highest (Fifth)	6.4	10.5	5.2	13.1	35.2	64.9	100.0
Nepal	**3.3**	**13.4**	**4.2**	**6.9**	**27.8**	**72.2**	**100.0**

Source : Annual Household Survey,2012/13, CBS

Table 3.16 : Current activity status of persons aged 15 years and older

	Employed	Unemployed	Not in labour force	Total	Labour force participation rate
Sex					
Male	82.9	2.7	14.4	100.0	85.6
Female	74.9	2.6	22.5	100.0	77.5
Urban/Rural					
Urban	61.0	5.3	33.7	100.0	66.3
Rural	82.4	2.1	15.5	100.0	84.5
Literacy					
Literate	75.6	3.2	21.1	100.0	78.9
Not literate	82.9	1.7	15.3	100.0	84.7
Age Group					
15 -- 19	59.2	2.7	38.1	100.0	61.9
20 -- 24	72.5	5.8	21.7	100.0	78.3
25 --29	82.1	4.1	13.8	100.0	86.2
30 -- 34	87.9	3.7	8.4	100.0	91.6
35 -- 39	91.7	3.1	5.3	100.0	94.7
40 -- 44	92.9	0.7	6.4	100.0	93.6
45 -- 49	91.9	0.9	7.2	100.0	92.8
50 -- 54	88.8	0.9	10.3	100.0	89.7
55 -- 59	85.4	2.1	12.5	100.0	87.5
60+	65.1	0.6	34.3	100.0	65.7
Consumption quintiles					
Lowest (First)	85.9	2.0	12.2	100.0	87.9
Second	85.9	1.7	12.4	100.0	87.6
Middle	82.2	2.2	15.6	100.0	84.4
Fourth	78.8	2.7	18.6	100.0	81.4
Highest (Fifth)	64.0	4.3	31.6	100.0	68.4
Nepal	**78.4**	**2.7**	**18.9**	**100.0**	**81.1**

Source : Annual Household Survey, 2012/13,CBS

Table 3.17 : Nominal household mean consumption with distribution by categories

Composition of nominal household consumption (in percent)								
	Food	Alcohol and tobacco	Rent	Utilities	Education	Durables	Non-food others	Total
Urban/rural								
Urban	45.1	2.2	19.4	1.2	6.7	1.8	23.6	100.0
Rural	62.5	4.3	9.8	0.7	2.2	0.9	19.6	100.0
Consumption Quintile								
Lowest (Small)	67.1	4.4	9.3	0.8	0.9	0.4	17.2	100.0
Second	63.9	4.5	9.4	0.7	2.0	0.6	18.8	100.0
Third	61.5	4.3	9.7	0.7	2.7	0.9	20.1	100.0
Fourth	54.4	3.7	12.6	0.8	4.6	1.4	22.3	100.0
Highest (Fifth)	40.6	2.1	20.2	1.1	6.6	2.9	26.4	100.0
Nepal	**59.2**	**4.0**	**11.6**	**0.8**	**3.0**	**1.1**	**20.4**	**100.0**

Source : Annual Household Survey, 2012/13,CBS

Table 3.18 : Nominal per capita consumption by decile

	Urban		Rural		Nepal	
Household Consumption Decile	Per capita mean consumption (Rs)	Share in total consumption (in percent)	Per capita mean consumption (Rs)	Share in total consumption (in percent)	Per capita mean consumption (Rs)	Share in total consumption (in percent)
Lowest (Small)	15433	0.4	14452	4.6	14488	3.3
Second	19863	0.4	19556	6.2	19563	4.4
Third	22954	1.0	23028	7.1	23023	5.2
Fourth	26537	1.3	26397	8.1	26407	5.9
Fifth	30362	1.7	30409	9.2	30405	6.8
Sixth	35245	2.8	35476	10.3	35450	8.0
Seventh	41240	3.8	41099	11.7	41117	9.2
Eighth	51655	9.0	50723	12.5	50951	11.4
Nineth	68757	15.2	67672	15.3	68008	15.3
Highest (Tenth)	150202	64.5	116215	15.1	136663	30.6
Nepal	**84134**	**100.0**	**36694**	**100.0**	**44596**	**100.0**

Source : Annual Household Survey, 2012/13,CBS

Chapter IV
Air and Climate

Table 4.1 : Annual Mean Temperature by Stations

S.N.	District / Stations Name	Latitude	Longitude	Elevation (masl)	Mean Temperature (^{0}c)									
					2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Banke, Nepalganj	28^0 06'	81^0 40'	165	22.6	25.1	25.5	25.6	24.2	24.3	24.6	24.8	24.3	24.8
2	Bara, Simara Airport	27^0 10'	84^0 59'	130	23.8	24	24.5	24.4	24.3	24.4	24.9	25	NA	24.4
3	Bhaktapur, Nagarkot	27^0 42'	84^0 59'	2163	9.9	8.8	9.2	8.6	14.6	14.5	14.6	15.1	14.5	14.6
4	Bhojpur,Bhojpur*	27^0 11'	85^0 13'	1595	-	-	-	-	-	-	-	-	-	-
5	Chitawan, Rampur	27^0 37'	84^0 25'	256	24.4	24.5	24.7	24.9	24.5	24.3	24.8	24.8	NA	22.2
6	Dadeldhura,Dadeldhura	29^0 18'	80^0 35'	1848	16.6	16.8	16.5	17.4	17.0	16.8	17.4	17.5	NA	17.6
7	Dailekh,Dailekh	28^0 51'	81^0 43'	1402	18.8	19.2	18.9	17.9	19.1	20.2	20.2	20.1	20.2	21.3
8	Dang ,Ghorahi	28^0 03'	82^0 30'	634	21.5	21.9	22.4	22.5	21.9	22.0	22.7	NA	NA	NA
9	Darchula,Darchula	29^0 51'	80^0 34'	1097	20.7	21.0	20.1	21	20.3	20.4	21.3	21.5	22.3	NA
10	Dhankuta,Dhankuta	26^0 59'	87^0 21'	1210	19.8	19.7	19.9	20.4	20.1	NA	20.6	20.9	20.1	20.7
11	Dolakha, Jiri	27^0 38'	86^0 14'	2003	14.3	14.3	14.2	14.9	5.3	14.3	14	NA	14.2	14.5
12	Dolpa, Dunai	28^0 56'	82^0 55'	2058	16.5	15.7	13.8	NA	14.4	NA	NA	NA	NA	NA
13	Doti, Dipayal	29^0 15'	80^0 57'	617	23.5	23.8	22.6	22.9	22.5	22.3	22.8	23.0	23.7	24.0
14	Gorkha,Gorkha	28^0 00'	84^0 37'	1097	20.8	17.1	20.2	22.7	22.0	22.9	21.9	22.5	22.2	21.8
15	Gulmi,Tamghas	28^0 04'	83^0 15'	1530	17.1	17.6	17.6	18.1	17.4	NA	18.0	18.5	17.7	17.8
16	Ilam,Ilam Tea State	26^0 55'	87^0 54'	1300	15.7	NA	16.8	20.2	23.5	NA	20.4	NA	NA	NA
17	Dhanusha,Janakpur Airport	26^0 43'	85^0 58'	90	24.6	24.8	25.2	25.3	25.0	25.0	25.5	25.4	NA	25.1
18	Jhapa, Kankai	26^0 35'	87^0 54'	143	24	24.5	25	25	24.5	24.6	24.8	24.9	24.4	24.2
19	Mustang,Jomsom	28^0 47'	83^0 43'	2744	11.6	12.1	11.8	12.3	11.9	11.5	11.8	12	11.4	11.2
20	Jumla,Jumla	29^0 17'	82^0 14'	2300	13.1	13.4	12.9	13.9	13.5	13.3	13.7	13.7	13.1	12.8
21	Kailali, Dhangadi	28^0 41'	80^0 41'	170	15	14.7	15	15.1	24.0	24.0	24.4	24.5	24.0	24.2
22	Kanchanpur, Mahendera Nagar	29^0 02'	80^0 13'	176	21.1	23.8	24.2	24.3	24.8	NA	24.4	24.6	NA	NA
23	Kaski, Lumle	28^0 18'	84^0 00'	1740	16.5	16.2	16.2	20.7	16.4	16.4	17.1	17.1	16.2	16.6
24	Kaski, Pokhara Airport	28^0 13'	83^0 48'	827	21.5	21.6	21.4	22	21.4	21.3	22.1	22.0	21.0	21.4
25	Kathmandu ,Kathmandu Airport	27^0 42'	85^0 22'	1336	19.2	19.2	19.4	19.8	19.5	19.5	20.0	20.3	19.3	19.3
26	Lamjung, Khudibazar	28^0 17'	84^0 22'	823	23	23.2	23.7	24.6	21.4	21.0	21.8	22.4	21.3	21.1
27	Makawanpur, Hetauda	27^0 25'	85^0 03'	474	22.5	22.3	23.1	23.7	23.3	23.4	24	23.8	NA	23.2
28	Manang, Chame	28^0 33'	84^0 14'	2680	NA	11.5	10.8	11.6	11.2	10.6	10.5	10	10.6	NA
29	Morong,Biratnagar Airport	26^0 29'	87^0 16'	72	24.3	24.5	25.2	25.2	24.9	24.9	25.2	25.2	24.7	24.9
30	Nawalparasi, Dumkauli	27^0 41'	84^0 13'	154	24.2	24.4	24.8	24.9	24.6	24.7	25.1	25.1	24.4	24.3
31	Nuwakot,Nuwakot	27^0 55'	85^0 10'	1003	NA	NA	21.5	22.5	22.1	22.0	22.7	NA	NA	22.2
32	Okhaldhunga,Okhaldhunga	27^0 19'	86^0 30'	1720	17.5	17.4	17.4	18	17.3	17.5	18.1	18.1	17.2	16.5
33	Palpa, Tansen	27^0 52'	83^0 33'	1343	14.1	20.5	20.1	21	21.0	20.2	20.4	19.9	20.5	20.0
34	Rautahat, Gaur	27^0 11'	85^0 10'	244	24.8	24.7	24.5	26.1	25.6	26.1	21.8	20.4	NA	19.1
35	Rupandehi,Bhairahawa Airport	27^0 31'	83^0 26'	109	24.5	24.8	25.2	25.3	25.0	24.9	25.3	25.2	24.7	25.0
36	Saptari Rajbiraj	26^0 33'	86^0 45'	91	22	23.8	25.7	25.2	23.7	25.7	25.1	25.1	24.2	24.6
37	Samkhuwasabha, Chainpur	27^0 17'	87^0 20'	1329	19.3	18.1	17.9	18	17.9	18.6	19.2	NA	18.6	19.1
38	Sunsari,Dharan	26^0 49'	87^0 17'	444	23.7	24.1	23.5	25	24.3	24.6	25.3	25.2	24.4	24.4
39	Surkhet, Birendranagar	28^0 36'	81^0 37'	720	21.7	22	22	22.4	21.8	21.9	22.3	22.9	22.5	22.4
40	Syangja,Syangja	28^0 06'	83^0 53'	868	20.9	21.1	20.7	21.5	21.1	20.7	21.6	21.6	20.9	21.0
41	Tanahaun, Khairenitar	28^0 10'	84^0 00'	823	23	23.2	23.7	24.6	23.7	23.3	23.8	23.8	23.3	23.1
42	Taplejung, Taplejung	27^0 21'	87^0 40'	1732	16.4	16.3	16.9	17.2	16.9	16.9	17.4	17.6	16.9	16.9

NA= Not Available; masl = meter above sea level
** Station has been closed since 2004*
Source: Department of Hydrology and Meteorology

Table 4.2 : Precipitation by District and Station

(precipitation in mm)

S. N.	District / Station Name	Latitude	Longitude	Elevation (masl)	1971-2000				
					Annual	Monsoon	Winter	Pre Monsoon	Post Monsoon
1	Banke, Nepalganj	28^0 06'	81^0 40'	165	1350.8	1137.8	60.7	93.1	59.2
2	Bara, Simara Airport	27^0 10'	84^0 59'	130	1806.2	1488.7	41.4	193.4	82.6
3	Chatara,Sunsari	26^0 49’	87°10’	183	2137.9	1694.9	40.1	243.5	159.4
4	Chitawan, Rampur	27^0 37'	84^0 25'	256	1995.8	1634.5	48.1	221.1	92.1
5	Dadeldhura,Dadeldhura	29^0 18'	80^0 35'	1848	1383.7	1003.8	131.4	200.7	47.9
6	Dang , Ghorahi	28^0 03'	82^0 30'	634	1600.8	1341.9	57.7	127.2	74
7	Dhankuta,Dhankuta	26^0 59'	87^0 21'	931	1008.7	722.5	38.7	182.6	64.8
8	Dhanusha, Janakpur	26^0 43'	85^0 58'	90	1395.6	1137.4	34.7	150.4	73.1
9	Doti, Dipayal	29^0 15'	80^0 57'	617	1145.2	802.4	122.8	172.4	47.6
10	Gorkha,Gorkha	28^0 00'	84^0 37'	1097	1779.6	1352.3	57.6	305.4	64.3
11	Gulmi,Tamghas	28^0 04'	83^0 15'	1530	1954.3	1585.2	85.1	216.3	67.7
12	Ilam, Ilam Tea State	26^0 55'	87^0 54'	1300	1713	1370.5	37.1	227.2	78.3
13	Jhapa, Kankai (Gaida)	26^0 35'	87^0 54'	143	2903.6	2391.2	39.2	312	161.2
14	Mustang, Jomsom	28^0 47'	83^0 43'	2744	257.7	135.4	24.3	58.8	39.1
15	Jumla,Jumla	29^0 17'	82^0 14'	2300	843.6	544.3	88.1	162.1	49.1
16	Kailali, Dhangadi	28^0 41'	80^0 41'	170	1792.5	1561.7	68.5	109.9	52.4
17	Kaski, Lumle	28^0 18’	83°48’	1740	5360.4	4541.4	100.5	481.8	236.7
18	Kaski, Pokhara	28^0 13'	84^0 00'	827	3951.5	3126.6	79.1	550.4	195.4
19	Kathmandu ,Kathmand Airport	27^0 42'	85^0 22'	1336	1439.7	1125.6	46.3	203.3	64.5
20	Lamjung, Khudibazar	28^0 17'	84^0 22'	823	3364.5	2750	95.6	395.8	123
21	Makawanpur, Hetauda	27^0 25'	85^0 03'	474	2331.3	1917.1	52.4	258.4	103.3
22	Manang, Chame	28^0 33'	84^0 14'	2680	935.3	575.7	102.7	183.6	73.2
23	Morang, Biratnagar	26^0 29'	87^0 16'	72	1881.1	1522.5	31.4	227.6	99.6
24	Nawalparasi, Dumkauli	27^0 41'	84^0 13'	154	2289.4	1907.8	51.5	240.9	89.2
25	Bara,Nijgadh	27^{0}11’	85°10’	244	2033	1673	40.1	216.8	103
26	Nuwakot,Nuwakot	27^0 55'	85^0 10'	1003	1978	1639.1	51	208.9	78.9
27	Okhaldhunga,Okhaldhunga	27^0 19'	86^0 30'	1720	1755.2	1401.6	38.1	233.4	82.1
28	Palpa , Tansen	27^0 52’	83°32’	1067	1520.7	1274.1	71	130.4	45.3
29	Parbat, Kushma	28^0 13’	83°42’	891	2498	2044.4	68.7	269.1	99.1
30	Dailekh,Dailekh	28^0 51'	81^0 43'	1402	1838.5	1504.1	96.6	182.4	55.4
31	Dolakha, Jiri	27^0 38'	86^0 14'	2003	2266	1815.4	52.1	307.9	90.6
32	Rupandehi, Bhairahawa	27^0 31'	83^0 26'	109	1673.1	1444.6	44.8	105.7	78
33	Sankhuwasava, Chainpur	27^0 17’	87°20’	1329	1435	982.3	36.6	334.3	81.8
34	Saptari, Rajbiraj	26^0 33'	86^0 45'	91	1493.1	1231.4	35.1	157.1	69.5
35	sindhuli,Sindhuligadhi	27^0 17’	85°58’	1463	2827.2	2232.2	50.7	368.8	175.6
36	Surkhet, Birendranagar	28^0 36'	81^0 37'	720	1603.1	1312.6	96.2	139.2	55.1
37	Syangja, Syngja	28^0 06'	83^0 53'	868	2888.8	2281.1	73.4	418.8	115.5
38	Tanahu, Khairanitar	28^0 02’	84°06’	500	2328.8	1707.3	67.1	464	90.4
39	Taplejung,Taplejung	27^0 21'	87^0 40'	1732	2010.9	1401.7	56	447.5	105.7

Note : 30 years in normal.

Source: Department of Hydrology and Meteorology

Table 4.3 : Annual Rainfall by Station

(rain fall in mm)

S. N.	Station	Latitude	Longitude	Elevation (masl)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Banke, Nepalganj	28^0 06'	81^0 40'	165	1279	967	NA	929	1184	1242	2567	1781	1585	1503	1396	1080
2	Bara, Simara Airport	27^0 10'	84^0 59'	130	2297	1949	2150	1965	1864	1861	2897	1643	1312	1580	1832	893
3	Bhaktapur, Nagarkot	27^0 42'	84^0 59'	2163	185	2321	2260	1807	1797	1669	2000	1512	1503	1715	2178	1768
4	Bhojpur,Bhojpurr*	27^0 11'	85^0 13'	1595	1304	1178	1086	-	-	-	-	-	-	-		
5	Chitawan, Rampur	27^0 37'	84^0 25'	256	234	2644	2694	2042	1732	1997	2743	1786	1909	2400	1184	1636
6	Dadeldhura,Dadeldhura	29^0 18'	80^0 35'	1848	132	1293	1391	1194	1102	941	1669	1479	1746	1527	1251	NA
7	Dailekh,Dailekh	28^0 51'	81^0 43'	1402	NA	1327	1999	1281	1792	1784	1697	1986	1686	1163	1785	NA
8	Dang , Ghorahi	28^0 03'	82^0 30'	634	1633	1364	1700	1318	1557	1266	1878	1363	1551	1569	NA	NA
9	Darchula,Darchula	29^0 51'	80^0 34'	1097	227	2183	2864	2616	2281	2386	3256	2336	2533	2963	NA	2254
10	Dhankuta,Dhankuta	26^0 59'	87^0 21'	1210	959	1090	1086	951	1156	859	964	NA	933	870	834	707
11	Dolakha, Jiri	27^0 38'	86^0 14'	2003	NA	NA	2839	2613	2015	1980	NA	2863	2010	2556	2682	2325
12	Dolpa, Dunai	28^0 56'	82^0 55'	2058	174	NA	273	203	94	266	175	292	200	458	441	NA
13	Doti, Dipayal	29^0 15'	80^0 57'	617	998	1025	1261	1034	987	907	1035	1096	1359	954	176	982
14	Gorkha,Gorkha	28^0 00'	84^0 37'	1097	1872	1743	1729	1613	1277	1114	1763	NA	1476	1900	1999	1896
15	Gulmi,Tamghas	28^0 04'	83^0 15'	1530	1974	1399	2314	1234	1570	1457	2239	1773	1794	1490	1807	1923
16	Ilam,ilam Tea State	26^0 55'	87^0 54'	1300	1331	1542	2001	NA	NA	1119	NA	NA	1243	NA	NA	NA
17	Dhanusha,Janakpur Airport	26^0 43'	85^0 58'	90	1775	1591	2008	2199	1307	1292	2563	1211	1320	964	NA	1042
18	Jhapa, Kankai	26^0 35'	87^0 54'	143	244	2311	2748	2451	1832	1697	2495	2860	2568	3027	2622	1839
19	Mustang,Jomsom	28^0 47'	83^0 43'	2744	240	308	319	230	309	302	312	NA	322	286	222	215
20	Jumla,Jumla	29^0 17'	82^0 14'	2300	728	842	843	685	670	748	832	967	696	795	945	785
21	Kailali, Dhangadi	28^0 41'	80^0 41'	170	1485	1626	2309	1418	1742	1448	2602	2677	2286	2070	1822	883
22	Kanchanpur, Mahendranagar	29^0 03'	80^0 22'	176	1407	2006	NA	NA	1680	1056	NA	NA	2843	1949	1593	1666
23	Kaski, Lumle	28^0 18'	84^0 00'	1740	5936	5730	6310	6096	4923	4162	6056	5902	4873	5700	5653	4689
24	Kaski, Pokhara Airport	28^0 13'	83^0 48'	827	4512	4484	4362	4129	2967	3024	4272	3263	3256	3967	3487	3266
25	Kathmandu,Kathmandu, Airport	27^0 42'	85^0 22'	1336	1621	1871	1740	1583	1236	1391	1346	1220	1205	1479	1655	1465
26	Lamjung, Khudibazar	28^0 17'	84^0 22'	823	314	3304	3849	3849	2838	2852	3372	3690	2642	3281	3338	3099
27	Makawanpur, Hetauda	27^0 25'	85^0 03'	474	2680	3323	2998	3103	2411	2114	2588	2134	2125	2676	2587	1626
28	Manang, Chame	28^0 33'	84^0 14'	2680	530	909	NA	974	1174	947	1683	1017	482	1235	NA	NA
29	Morang,Biratnagar Airport	26^0 29'	87^0 16'	72	2279	1923	2108	2144	1596	1300	2117	1700	1690	1870	1920	1058
30	Nawalparasi, Dumkauli	27^0 41'	84^0 13'	154	297	2591	3280	2611	2213	2117	3264	1966	1924	2668	2203	2148
31	Nuwakot,Nuwakot	27^0 55'	85^0 10'	1003	2484	2111	2216	2007	1589	1255	1550	NA	882	NA	NA	NA
32	Okhaldhunga,Okhaldhunga	27^0 19'	86^0 30'	1720	2192	2001	1716	1619	1902	1696	2180	NA	1594	1574	1896	1721
33	Palpa , Tansen	27^0 52'	83^0 33'	1343	-	-	1799	1509	1294	1130	1571	1536	1344	1734	1129	1942
34	Bara, Nijghad	27^0 11'	85^0 10'	244	2130	2524	2326	2929	NA	NA	NA	NA	1108	1146	1540	NA
35	Rupandehi,Bhairahawa	27^0 31'	83^0 26'	109	2016	1269	1953	1524	1768	1214	2066	1669	1504	1904	1284	1387
36	Samkhuwasabha, Chinpur	27^0 17'	87^0 20'	1329	173	1683	1745	1392	1332	1521	2395	1249	1348	1669	1327	1275
37	Saptari Rajbiraj	26^0 33'	86^0 45'	91	182	2024	1763	2185	NA	NA	NA	1212	951	1141	1680	969
38	Sindhuli, Sindhilighadi	27^0 17'	88^0 58'	1463	2787	2919	2617	NA	NA	NA	1711	1279	1543	NA	2263	1822
39	Sunsari, Dharan	26^0 49'	87^0 17'	444	2616	2214	2325	2326	2027	1751	2167	2280	1887	2711	1637	1836
40	Surkhet, Birendranagar	28^0 36'	81^0 37'	720	1722	1538	1849	1425	1810	1485	1864	1508	1726	1975	1659	1173
41	Syangja,Syangja	28^0 06'	83^0 53'	868	3260	3861	3328	3114	2249	2675	3498	NA	2979	2904	2832	2735
42	Tanahaun, Khairenitar	28^0 10'	84^0 00'	823	227	3058	2056	2113	2089	2202	2151	2122	2979	1877	2406	2026
43	Taplejung,Taplejung	27^0 21'	87^0 40'	1732	1912	2173	2505	1746	1795	2147	2055	1766	1409	2233	1435	2006

** Station has been closed since 2004 Source: Department of Hydrology and Meteorology.*

Table 4.4 : Average Sunshine Duration by Station

(hr/day)

S. N.	District / Station Name	Latitude	Longitude	Elevation (masl)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Banke, Nepalganj	28^0 06'	81^0 40'	165	NA	NA	NA	7.40	7.30	6.90	7.70	7.30	7.39	7.46
2	Bara, Simara Airport	27^0 10'	84^0 59'	130	7.10	7.10	7.80	7.20	6.90	7.60	7.30	7.30	NA	7.27
3	Dadeldhura,Dadeldhura	29^0 18'	80^0 35'	1848	7.50	8.00	7.20	NA	7.30	6.70	7.70	7.30	6.6	6.4
4	Dhankuta,Dhankuta	26^0 59'	87^0 21'	1210	6.90	NA	6.80	6.70	6.40	6.70	6.90	6.70	6.38	7.33
5	Doti, Dipayal	29^0 15'	80^0 57'	617	6.80	NA	6.70	6.70	NA	6.80	7.30	7.70	5.65	6.68
6	Jumla,Jumla	29^0 17'	82^0 14'	2300	6.90	NA	7.20	NA	NA	6.70	7.60	7.40	6.37	7.79
7	Kaski, Pokhara Airport	28^0 13'	83^0 48'	827	6.60	6.40	6.50	6.60	6.30	6.40	NA	6.40	NA	NA
8	Kathmandu Kathmandu Airport	27^0 42'	85^0 22'	1336	NA	5.60	6.00	6.10	5.50	6.00	6.40	6.35	5.93	6.72
9	Morang, Biratnagar Airport	26^0 29'	87^0 16'	72	6.70	NA	7.40	6.80	6.40	6.50	6.50	6.10	6.04	7.1
10	Okhaldhunga,Okhaldhunga	27^0 19'	86^0 30'	1720	6.00	NA	5.80	6.10	5.40	6.20	6.60	6.00	6.07	6.51
11	Rupandehi, Bhairahawa Airport	27^0 31'	83^0 26'	109	NA	NA	7.30	7.10	6.90	NA	7.60	7.40	NA	NA
12	Surkhet, Birendranagar	28^0 36'	81^0 37'	720	NA	NA	NA	NA	6.90	6.80	7.40	7.20	7.4	7.73
13	Taplejung,Taplejung	27^0 21'	87^0 40'	1732	NA	NA	NA	6.10	NA	6.00	6.80	6.30	5.86	6.52
14	Kailali,Dhangadhi	28^0 41'	80^0 41'	170	6.50	NA	7.00	7.10	6.60	6.30	7.50	6.80	6.57	6.77
15	Lalitpur,Khumaltar	27°40’	85° 20’	1350	5.80	6.20	6.60	6.60	5.70	6.30	6.50	6.60	6.16	6.8

Source: Department of Hydrology and Meteorology.

Table 4.5 : Average Wind Speed by Station

(km/hr)

S. N.	Station Name	Year												
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Arghakhanchi (Khanchikot)	NA	NA	NA	6.7	5.6	6.6	NA	NA	NA	NA	NA	NA	NA
2	Bardia (Chishapani)	NA	NA	NA	NA	NA	7.2	NA	NA	NA	NA	NA	NA	NA
3	Rupandehi,Bhairahawa Agriculture	2.8	NA	2.7	2.5	2.8	2.7	2.7	NA	NA	NA	NA	NA	NA
4	Bhojpur,Bhojpur*	0.7	0.7	0.8	1.2	-	-	-	-	-	-	-	-	-
5	Dadeldhura,Dadeldhura	3.1	2.2	1.8	1.8	2.3	3.4	2.9	2.6	2.6	2.8	NA	2.11	NA
6	Dhankuta,Pakhribas	NA	NA	1.1	0.8	1.3	1.2	1.3	N.A	0.9	N.A	NA	NA	NA
7	Dhankuta, Dhankuta	4.2	4.1	4.1	3.8	3.9	3.9	3.5	3.2	3.3	3.1	2.9	2.51	2.54
8	Dolakha (Jiri)	NA	NA	NA	2.5	2.9	3.2	3.1	N.A	3.0	N.A	3.2	2.92	NA
9	Doti, Dipayal	NA	NA	1.1	0.9	0.8	1.4	2	1.9	1.5	1.6	NA	NA	NA
10	Ilam , Ilam Tea State	NA	NA	NA	NA	NA	1.2	1.2	NA	NA	NA	NA	NA	NA
11	Jhapa, Kankai Gaida	1.4	1.2	1.2	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	Mustang,Jomsom	NA	NA	NA	15.6	16.1	NA	NA	NA	NA	NA	NA	NA	NA
13	Jumla,Jumla	NA	NA	5.8	5.2	6.0	5.4	5.6	5.3	4.6	4.8	4.4	4.16	
14	Kailai, Dhangadhi	NA	NA	NA	NA	NA	NA	NA	1.7	1.7	1.6	NA	NA	NA
15	Kanchanpur,Mahendranagar	1.9	1.9	1.9	NA	1.8	2.4	2.1	NA	NA	NA	NA	NA	NA
16	Kaski ,Lumle	1.4	1.3	1.1	1.1	1.1	1.3	1.3	1.4	1.2	0.8	0.7	0.76	NA
17	Kathmandu ,Kathmandu Airport	1.0	0.8	1.0	0.9	0.8	0.8	NA	0.7	0.9	0.6	0.6		NA
18	Lalitpur ,Khumaltar	3.1	3.1	2.8	3.1	3.1	3.0	3.0	3.0	3.2	3.0	3.0	2.68	NA
19	Kaski, Malepatan	1.0	0.7	0.7	0.5	0.3	0.3	0.3	0.4	0.3	0.2	0.28	NA	NA
20	Morang, Biratnagar Airport	1.5	1.1	2.2	2.8	2.0	1.8	NA	5.9	6.5	5.0	2.8	1.24	2.25
21	Bhaktpur, Nagarkot	6.2	NA	NA	5	4.4	4.3	3.7	2.9	2.7	0.9	NA	NA	NA
22	Banke, Nepalganj	NA	2.4	2.6	2.5	2.6	2.8	2.0	1.9	1.5	1.6	NA	NA	NA
23	Banke,Khajura	NA	NA	1.6	1.7	1.9	2.2	1.9	1.9	1.9	1.8	NA	NA	NA
24	Banke, Sikta	NA	NA	1.3	1.6	1.6	1.9	1.5	0.6	0.8	0.6	NA	1.49	NA
25	Okhaldhunga,Okhaldhunga	3.6	2.8	4.1	3.4	2.3	2.7	4.3	4.3	3.8	2.0	2.3	2.03	4.76
26	Parsa, Parwanipur	2.3	NA	2.1	2.0	2.2	2.5	1.7	0.7	1.3	-0.4	0.5	NA	NA
27	Kaski, Pokhara Airport	2.7	2.4	2.1	2.4	2.3	2.3	NA	1.9	2.1	2.3	NA	2.57	NA
28	Siraha, Lahan	NA	NA	3.1	3.5	3.3	3.9	NA	N.A	1.9	1.1	NA	NA	NA
29	Sunsari ,Tarahara	NA	NA	3.9	4.5	4.0	4.5	7.0	6.4	6.2	N.A	6.3	NA	NA
30	Surkhet ,Birendranagar	2.1	2.1	2.0	1.7	1.5	1.6	1.2	1.3	1.6	1.0	NA	NA	NA
31	Surkhet ,Pusmacamp	1.8	NA	2.1	1.9	1.7	1.6	1.9	1.6	N.A	N.A	NA	NA	NA
32	Taplejung, Taplejung	2.5	3.1	3.0	NA	2.6	2.5	NA	1.5	1.8	1.7	1.7	1.68	1.68

NA= Not Available
** Station has been closed since 2004*
Source: Department of Hydrology and Meteorology

Table 4.6 : Air Quality Data Sheet Monitoring Parameter : PM10 Month / Year : Falgun 2070 (13th Feb 2014 - 14 Mar 2014)

Date BS	Date AD	Day	Putalisadak				Machhe Gaun				Bhaktapur			
			Head No.	Filter Paper No.	PM10(µg/m3)	Remarks	Head No.	Filter Paper No.	PM10(µg/m3)	Remarks	Head No.	Filter Paper No.	PM10(µg/m3)	Remarks
1	13-Feb	Thu	7	P117	224		1	M117	48		8	B104	109	
2	14-Feb	Fri	8	P118	276		2	M118	40		1	B105	102	rainfall
3	15-Feb	Sat	1	P119	112		3	M119	54		2	B106	99	rainfall
4	16-Feb	Sun	2	P120	382		4	M120	38		3	B107	80	rainfall
5	17-Feb	Mon	3	P121	127		5	M121	49		4	B108	86	
6	18-Feb	Tue	4	P122	262		6	M122	53		5	B109	106	
7	19-Feb	Wed	5	P123	311		7	M123	35		6	B110	117	
8	20-Feb	Thu	6	P124	187		8	M124	46		7	B111	120	
9	21-Feb	Fri	7	P125	213		1	M125	58		8	B112	123	
10	22-Feb	Sat	8	P126	269		2	M126	42		1	B113	135	
11	23-Feb	Sun	1	P127	324		3	M127	35		2	B114	132	
12	24-Feb	Mon	2	P128	64		4	M128	47		3	B115	145	
13	25-Feb	Tue	3	P129	339		5	M129	32		4	B116	138	
14	26-Feb	Wed	4	P130	226		6	M130	26		5	B117	133	
15	27-Feb	Thu	5	P131	236		7	M131	45		6	B118	127	
16	28-Feb	Fri	6	P132	232		8	M132	42		7	B119	112	
17	1-Mar	Sat	7	P133	133		1	M133	21		8	B120	93	rainfall
18	2-Mar	Sun	8	P134	191		2	M134	79		1	B121	102	
19	3-Mar	Mon	1	P135	299		3	M135	54		2	B122	115	
20	4-Mar	Tue	2	P136	277		4	M136	31		3	B123	121	
21	5-Mar	Wed	3	P137	213		5	M137	46		4	B124	122	
22	6-Mar	Thu	4	P138	266		6	M138	40		5	B125	135	
23	7-Mar	Fri	5	P139	188		7	M139	47		6	B126	131	
24	8-Mar	Sat	6	P140	127		8	M140	31		7	B127	125	
25	9-Mar	Sun	7	P141	162		1	M141	39		8	B128	139	
26	10-Mar	Mon	8	P142	248		2	M142	47		1	B129	133	
27	11-Mar	Tue	1	P143	337		3	M143	85		2	B130	140	
28	12-Mar	Wed	2	P144	261		4	M144	56		3	B131	152	
29	13-Mar	Thu	3	P145	247		5	M145	63		4	B132	145	
30	14-Mar	Fri	4	P146	260		6	M146	77		5	B133	135	

Source : Department of Environment

Table 4.7 : Noise Level at Different Areas

(dBA)

Traffic Area	Day Hour			Night Hour	
	Nepal Observed	WHO Guideline	Indian Guideline	Nepal Observed	Indian Guideline
High Traffic Area		70			
Kalanki, Kathmandu	74			70	
Shahidgate, Kathmandu	67			69	
Putalisadak, Kathmandu	75			69	
Maitighar, Kathmandu	71			70	
TU Gate, Kirtipur, Kathmandu	58			58	
Lagankhel, Lalitpur	70			70	
Satdobato, Lalitput	70			71	
Kupandol, Lalitpur	77			75	
Suryabinayak, Bhaktapur	71			81	
Thimi Bus Stop, Bhaktapur	65			53	
Ramananda Chowk, Janakpur	68			62	
Commercial Cum Residence Area			64		55
Asan Chowk , Kathmandu	74			67	
Naya Bazar, Kirtipu, Kathmandu	64			62	
Manbhawan, Lalitpur	71			67	
Bhanu Chowk, Janakpur	70			67	
Commercial Cum Tourist Area			65		55
Thamel Chowk, Kathmandu	75			61	
Darbar Squar, Bhaktapur	59			50	
Mangal Bazar, Lalitpur	69			59	
Janaki Mandir, Janakpur	73			70	
Old Residence Area					45
Lagan, Kathmandu	68			67	
Panga, Kirtipur, Kathmandu	60			57	
Bhatkepati, Kirtipur, Kathmandu	52			60	
Pimbhal, Lalitpur	57			51	
Katunje, Bhaktapur	52			65	
Bhairab Mandir, Bhaktapur	67			51	
Maharaj Sagar, Janakpur	58			61	
New Residence Area			55		45
Samakhushi, Kathmandu	55			60	
Sano Thimi, Bhaktapur	62			62	
Sanitar, Bhaktapur	60			53	
Sainbu, Lalitpur	45			42	
Khumaltar, Lalitpur	53			54	
Industrial Area		70	75		70
Balaju Yantra Shala, BID	78			70	
Chirag Foam Ind. Pvt. Ltd., BID	63			54	
Balaju Industrial Gate, BID	74			68	
Supreme Textile,PID	61			58	
Himal Tents Pvt. Ltd., PID	61			56	
Patan Industrial Gate, PID	70			70	

Source: Nepal Health Research Council and World Health Organization, Assessment of Noise Pollution and Development of Criteria for its Prevention and Control, June 2003.

Table 4.8 : Average Indoor Radon Concentration (CRn) and annual effective dose in the Dwellings of Kathmandu Valley

S.No.	Name of district	Number of Dwellings	Radon Concentration ((CRn)) (Bq/m3)			Annual effective dose (mSv)
			Minimum	Maximum	Average±2σ	
1	Bhaktapur	24	36±8	415±71	90±17	1.54
2	Kathmandu	40	8±2	161±29	56±11	0.96
3	Lalitpur	25	8±2	787±134	93±17	1.59
Arithmetic mean					80±15	1.36

Source: Nepal Academy of Science and Technology

Table 4.9 : PM_{10}, TSP, SO_2, NO_2, Co and pb Measurements

(Average Time 8 hrs.)

Major city (Site)	Altitude (masl)	Date	Time	Parameters				
				PM_{10}	TSP	NO_2	Co	pb
				($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
Pokhara	827	26/11/2000	10:00-18:00	90.2	118.5	9.1	NA	0.11
Birganj	91	30/11/2000	10:00-18:00	482.9	567.8	23	378	0.27
Biratnagar	125	4/12/2000	08:00-16:00	961.4	1024.3	24.5	1145.5	0.24
Janakpur	90	7/11/2000	11:00-19:00	1820.9	2019.5	20.7	859.11	0.53
Narayanghat	256	10/12/2000	08:00-16:00	196.3	260.3	14.8	NA	0.04
Butawal	205	19/12/2000	07:00-15:00	1076.6	1150.2	21.38	229.09	0.09
Bhairahawa	110	22/12/2000	07:00-15:00	864.8	926.41	23.28	1145.5	0.13
Nepalganj	144	26/12/2000	07:00-15:00	2104.8	2222.5	17.78	1445.5	0.23
Mahendranagar	176	29/12/2000	08:00-16:00	355.05	378.54	17.14	NA	0.04

Note : Data were collected using high volume air sampler.
Source: Nepal Health Research Council and Nepal Environmental and Scientific Services (P) Ltd., (Transport Sector Air Pollution Survey, at Nine Major Urban Cities of Nepal, the World Conservation Union, Sept, 2001).

Table 4.10 : Ozone Depleting Substance (ODS) Protection Status-Montreal Protocal, 1987

A) Montrial Protocal : Controlled Substance-1					
No	Annex	Group	Chemical Composition of Ozone Depleting Substance	Name of Ozone Depleting Substance	Ozone-Depleting Potencial
1	A	1	Trichlofluoromethane $CFCl_3$	(CFC -11)	1.0
2	A	1	Dichlorodifluoromethane CF_2Cl_2	(CFC -12)	1.0
B) Montrial Protocal : Controlled Substance-2					
1	C	1	Chlorodifluoromethane CHF_2Cl	(HCFC -2402)	0.055
C) Montrial Protocal : Controlled Substance-3					
1	A	II	Bromochlorodifluoromethane (CF_2BrCl)	Halon-1211	3.0
2	A	II	Bromotrifluoromethane (CF_3Br)	Halon-1301	10.0
3	A	II	Dibromotetrafluoromethane ($C_2F_4Br_2$)	Halon-1213	6.0
4	B	II	Carbon Tetrachloride (CCl_4)	Carbon Tetrachloride	1.1
5	B	III	1,1,1-trichloroethane($C_2H_2Cl_3$)	Methyl Chloroform	0.1
6	E	I	Bromomethane (CF_3Br)	Methyl Bromide	0.6

D) Phase Out rate of CFC-11 and CFC-12	
Year	**CFC-11 and CFC-12 (MT)**
2000	29.058
2001	26
2002	23
2003	20
2004	17.0
2005	14
2006	11
2007	8
2008	5
2009	2
2010	0

Source : Nepal Gazette 2057/6/9 . Aditional 36

Table 4.11: Physiographic and Bioclimatic Zones of Nepal

Physiographic Zone	Area (%)	Elevation (m)	Bioclimatic Zone
High Himal	23	above 5000	Nival (Tundra and Arctic)
High Mountains	19	4,000-5,000	Alpine
		3,000-4,000	Sub-alpine
Middle Mountains	29	2,000-3,000	Montane(Temperate)
		1,000-2,000	Subtropical
Siwalik	15	500-1,000	Tropical
Terai	14	below 500	Tropical

Source: Ministry of Forest and Soil Conservation

Table 4.12 : National Ambient Air Quality Standards for Nepal, 2012

Parameters	Units	Averaging Time	Concentration in Ambient Air, maximum	Test Methods
TSP (Total SuspendedParticulates)	$\mu g/m^3$	Annual	-	
		24-hours*	230	High Volumne Sampling and Gravimetric Analysis
PM10	$\mu g/m^3$	Annual	-	
		24-hours*	120	High Volume Sampler and Gravimetric Analysis, TOEM,Beta Attenuation
Sulphur Dioxide	$\mu g/m^3$	Annual**	50	Ultraviolet Fluorescence,Waste & Gaeke method
		24-hours*	70	Same as annual
Nitrogen Dioxide	$\mu g/m^3$	Annual	40	Chemiluminescence
		24-hours*	80	Same as annual
Carbon Monoxide	$\mu g/m^3$	8 hours*	10,000	Non dispersive Infra Red spectrophotometer(NDIR)
Lead	$\mu g/m^3$	Annual**	0.5	High volume sampling, followed by atomic absorption spectrometry
Benzene	$\mu g/m^3$	Annual**	5	Gas chrometographic Technique
PM2.5	µg/m3	24-hours*	40	PM2.5 sampling gravimetric analysis
Ozone	µg/m3	8 hours*	157	UV spectrophotometer

** 24 & 8 hourly values shall be met 95% of the time in a year. 18 days per calendar year the standard may be exceeded but not on two consecutive days.*

*** The above indicators are prepared by the 104 data taken yearly averagein a fixed location in one week by observing two times in 24 hours.*

Table 4.13 : Average Rainfall and Temperature by Altitude

Average Annual Rainfall (mm)	Temperature Zone: Altitude (in masl)			
	Less than 1000	1000-1500	1500-2000	2000-3000
Less than 500				Jomsom, Mustang
500-1000				Jumla
1000-2000	Mahendranagar, Kanchanpur	Salyan		Chailsa
	Nepalganj Banke	Nuwakot	Okhaldhunga	
	Dhangadi, Kailali	Dhankuta	Pakhribas	
	Bhairahawa, Rupandehi	Patan, Baitadi		Daman, Makawanpur
	Janakpur, Dhanusha	Gorkha	Tamghas	
	Dipayal, Doti	Ilam	Bhojpur	
	Simara, Bara	Silgadhi, Doti	Dadeldhura	
	Biratnagar, Morang	Dailekh		
2000-3000	Butawal, Rupandehi			Musikot
	Khairenitar, Tanahu		Chatara	Kakani, Nuwakot
	Hetauda, Makawanpur			
	Syangja, Syangja		Kannyam	Jiri, Dolakha
		Taplethok		
Greater than 3000				Lete
	Pokhara, Kaski	Panchsaya Khola		
			Lumle, Kaski	
	Khudibazar, Lamjung			

Source: Department of Hydrology and Meteorology,1994.

Table 4.14 National Indoor Air Quality Standard, 2009

Pollutant	Maximum Concentration	
	Level	Average Time
Particulate matter (PM_{10})	120 µg/m^3	24- hour
	200 µg/m^3	1- hour
Particulate matter ($PM_{2.5}$)	60 µg/m^3	24- hour
	100 µg/m^3	1- hour
Carbon monoxide (CO)	9 ppm (10 mg/$m^{3)}$	8- hour
	35 ppm (40 mg/$m^{3)}$	1- hour
Carbon dioxide (CO_2)	1000 ppm (1800 mg/m^3	8- hour

Table 4.15 : Standard on Emission for Industrial Boiler

Steam generation capacity of Boiler(Kg/hr)	Pollutant	Limits mg/Nm3
less than 2000	Pollutate matter	1200*
2000 to less than 10000		800*
10000 to less than 15000		600*
15000 to above		150**

* As a controller equipment Cyclone/Muticyclone to be attached with Boiler

** As a controller equipment Bag filter/Electrostatic precipittor, ESP to be assocaited with Boiler

12% of CO2 correction is used as reference to the emission of particulate matter in mg/Nm3.

Source: Ministry of Environment, Science and Technology

Table 4.16 : Standard on Emission for Dust Particles in Air

Industry	Compulsory	Emission limit
Cement Industry	Total Suspended Perticulate Matter	Less than 500 µg/Nm3
Croser Industry		Less than 600 µg/Nm3

Source: Ministry of Environment, Science and Technology

Table 4.17 : Standard on Emission of Smoke in Air by New Dissel Generator (Import)

Emission limit (g/kWh)

Category_(kW)	CO	HC+Nox	PM
kW<8	8	7.5	0.8
8=kW<19	6.6	7.5	0.8
19=kW<37	5.5	7.5	0.6
37=kW<75	5	4.7	0.4
75=kW<130	5	4	0.3
130=kW<560	3.5	4	0.2

Note : This standard is equivalent to EURO III or INDIA III

Source: Ministry of Environment, Science and Technology

Table 4.18 : National Ambient Sound Quality Standard, 2012

	Area	Sound limit Leq (dBA)	
		Day	Night
Sound Limit	Industrial Area	75	70
	Commercial Area	65	55
	Rural Residental Area	45	40
	Urban Residental Area	55	50
	Mixed Residental Area	63	55
	Peace Area	50	40
Uptimum Sound emission limit		Household applicance	Uptimum limit (dBA)
		Water Pump	65
		Disel Generetor	90
		Entertainment goods	70

Table 4.19 : WHO Guideline Value on Air Quality

Compound	Guideline Value	Averaging Time
Ozone (1)	120 micrograms/m^3 (0.06 ppm)	8 hours
Nitrogen dioxide (1)	200 micrograms/cubic metre (0.11 ppm)	1 hour
	40 to 50 micrograms/cubic metre (0.021 to 0.026 ppm)	1 hour
Sulfur dioxide (1)	500 micrograms/cubic metre(0.175 ppm)	10 min
	125 micrograms/cubic metre (0044 ppm)	24 hours
	50 micrograms per cubic metre (0.017 ppm)	1 hour
Carbon monoxide (2)	100 milligrams/cubic metre (90 ppm)[b]	15 min
	60 mg/cubic metre (50ppm)	30 min
	30 mg/cubic metre (25 ppm)	1 hour
	10 mg/cubic metre (10 ppm)	8 hours
Lead (3)	0.5 to 1.0 micrograms/cubic	1 hour

(1) No guideline values were set for particulate matter because there is no evident threshold for effects on morbidity and mortality.

(2) The guideline is to prevent carboxyhemoglobin levels in the blood from exceeding 2,5%. The values above are mathematical estimates of some of the CO concentrations and averaging times at which this goal should be achieved.

(3) The guideline for lead was established by WHO in 1987.

Source: World Health Organization (Ambient Air Quality Guideline).

Table 4.20 : Ranges of Emission Reductions Required for Various Stabilization Level (Bali Declaration)

(The ranges of the difference between emission in 1990 and emission allowances in 2030/2050 for various GHG concentration levels Annex I and Non-Annex I countries as a group [a])

SCENARIO CATEGORY (lowest level of GHG assesses by IPCC 2007)	UNIT	REGION	2020	2050
A- 450	ppmv CO_2 -eq (b)	Annex I	-25% to -40%	-80% to -95%
		Non- Annex I	Substantial deviation from baseline in Latin America, Middle East, East Asia and Centrally-planned Asia	Substantial deviation from base line in aii regions
B-550	ppmv CO_2 -eq (b)	Annex I	-10% to -30%	-40% to -90%
		Non- Annex I	Deviation from baseline in Latin america, Middle East, East Asia.	Deviation from baseline in most regions, specially Latin america, Middle East.
C-650	ppmv CO_2 -eq (b)	Annex I	-0% to -25%	-30% to -80%
		Non- Annex I	Baseline	Deviation from baseline in most regions, specially Latin america, Middle East.

a- The aggregate range is based on multiple approaches to apportion emission between regions (concentration and convergence, multistage. Triptych and intensity targets among others). Each approach makes different assumptions about the pathway, specific national efforts and other variables. Additional extreme cases- in which Annex. I undertakes all reductions, or non-Annex I undertakes all reductions- are not included. The range presented here do not imply political feasibility, nor do not result reflect cost variances.

b- Only the studies aiming at stabilization at 450 ppmv CO_2, -eq assume a (temporary) overshoot of about 50 ppmv CO_2, -eq (see Den Elzen and Mainshausen, 2006)

Annex I and II = Industrialized countries and that pay for cost in developing countries . (The Bali Road Map page 205). Non-Annex - I except Annex I and II.

Source : IPCC Working Group III (WG III) Chapter 13 Box 13.7.

Chapter V

Land and Soil

Table 5.1 : Land use Pattern by Type, Nepal, 1978/79-2001

(Area in ha.)

S.N.	Types of Land	1978/79*		1985/86*		2001**	
		Area	Percent	Area	Percent	Area	Percent
1	Cultivated land	2969400	20.1	3052000	20.7	3090780	21.0
2	Non Cultivated land	986900	6.7	998000	6.8	1030390	7.0
3	Forest	5612400	38.1	5518000	37.4	4268200	29.0
4	Shrub land	694000	4.7	706000	4.8	1560110	10.6
5	Grass land	1755900	11.9	1745000	11.8	1766160	12.0
6	Other land	2729800	18.5	2729000	18.5	2619800	17.8
7	Water /Lake	NA		NA		382660	2.6
Total		**14748400**	**100.0**	**14748000**	100.0	**14718100**	100.0

*Source : *Water and Energy Commission Secretariat(Energy Sector Synopsis Report 2010)*

***Department of Forest Research and Survey, 2001*

Table 5.2 : Population - Land Ratio and Population Density by District , 2011

S.N.	District	Geographical Area (sq.km.)	Holdings		Household	Population	Population Land Ratio (person per ha .)	Population Density (person per sq.km.)
			Number	Area (ha)				
1	Taplejung	3646	23444	22327.5	26509	127461	5.71	35
2	Panchthar	1241	36664	28725.5	41196	191817	6.68	155
3	Ilam	1703	57950	53394.3	64502	290254	5.44	170
4	Jhapa	1606	120538	102442.6	184552	812650	7.93	506
5	Morang	1855	126891	109943.0	213997	965370	8.78	520
6	Sunsari	1257	86650	75141.3	162407	763487	10.16	607
7	Dhankuta	891	31382	25488.7	37637	163412	6.41	183
8	Terhathum	679	19608	19102.2	22094	101577	5.32	150
9	Sankhuwasabha	3480	29983	28955.6	34624	158742	5.48	46
10	Bhojpur	1507	36832	29775.8	39419	182459	6.13	121
11	Solukhumbu	3312	21478	19116.8	23785	105886	5.54	32
12	Okhaldhunga	1074	30451	28546.9	32502	147984	5.18	138
13	Khotang	1591	40358	31349.9	42664	206312	6.58	130
14	Udayapur	2063	54919	28162.3	66557	317532	11.28	154
15	Saptari	1363	89241	73907.7	121098	639284	8.65	469
16	Siraha	1188	88527	78797.5	117962	637328	8.09	536
17	Dhanusa	1180	96006	72307.2	138249	754777	10.44	640
18	Mahottari	1002	80844	64977.2	111316	627580	9.66	626
19	Sarlahi	1259	98288	80678.4	132844	769729	9.54	611
20	Sindhuli	2491	51233	26626.3	57581	296192	11.12	119
21	Ramechhap	1546	40888	30372.4	43910	202646	6.67	131
22	Dolakha	2191	40718	26844.6	45688	186557	6.95	85
23	Sindhupalchok	2542	58998	34781.5	66688	287798	8.27	113
24	Kavrepalanchok	1396	68872	39707.3	80720	381937	9.62	274
25	Lalitpur	385	33616	9300.3	109797	468132	50.33	1,216
26	Bhaktapur	119	30631	5682.8	68636	304651	53.61	2,560
27	Kathmandu	395	51462	9595.6	436344	1744240	181.77	4,416
28	Nuwakot	1121	53984	32996.5	59215	277471	8.41	248
29	Rasuwa	1544	8504	4557.7	9778	43300	9.50	28
30	Dhading	1926	64517	35398.0	73851	336067	9.49	174

Table 5.2 : Population - Land Ratio and Population Density by District , 2011

Contd.....

S.N.	District	Geographical Area (sq.km.)	Holdings		Household	Population	Population Land Ratio (person per ha .)	Population Density (person per sq.km.)
			Number	Area (ha)				
31	Makwanpur	2426	67111	31802.8	86127	420477	13.22	173
32	Rautahat	1126	79233	64834.9	106668	686722	10.59	610
33	Bara	1190	81292	56866.7	108635	687708	12.09	578
34	Parsa	1353	59496	48898.7	95536	601017	12.29	444
35	Chitawan	2218	88242	40631.6	132462	579984	14.27	261
36	Gorkha	3610	57671	31493.5	66506	271061	8.61	75
37	Lamjung	1692	33041	17265.8	42079	167724	9.71	99
38	Tanahu	1546	59233	29022.3	78309	323288	11.14	209
39	Syangja	1164	57613	29450.6	68881	289148	9.82	248
40	Kaski	2017	53268	23438.6	125673	492098	21.00	244
41	Manang	2246	993	473.6	1480	6538	13.81	3
42	Mustang	3573	2420	1374.8	3354	13452	9.78	4
43	Myagdi	2297	22480	12358.5	27762	113641	9.20	49
44	Parbat	494	28644	12598.9	35719	146590	11.64	297
45	Baglung	1784	51663	30686.6	61522	268613	8.75	151
46	Gulmi	1149	57705	40910.4	64921	280160	6.85	244
47	Palpa	1373	48830	29985.3	59291	261180	8.71	190
48	Nawalparasi	2162	101337	56125.2	128793	643508	11.47	298
49	Rupandehi	1360	104174	71188.0	163916	880196	12.36	647
50	Kapilbastu	1738	74770	64578.0	91321	571936	8.86	329
51	Arghakhanchi	1193	43422	31597.3	46835	197632	6.25	166
52	Pyuthan	1309	44423	25811.8	47730	228102	8.84	174
53	Rolpa	1879	40284	24853.3	43757	224506	9.03	119
54	Rukum	2877	37759	21375.2	41856	208567	9.76	72
55	Salyan	1462	42840	26684.8	46556	242444	9.09	166
56	Dang	2955	86623	61951.5	116415	552583	8.92	187
57	Banke	2337	61433	44120.1	94773	491313	11.14	210
58	Bardiya	2025	68063	47233.5	83176	426576	9.03	211
59	Surkhet	2451	56571	27241.3	72863	350804	12.88	143
60	Dailekh	1502	45079	21329.3	48919	261770	12.27	174
61	Jajarkot	2230	28546	16127.2	30472	171304	10.62	77
62	Dolpa	7889	6696	3733.4	7488	36700	9.83	5
63	Jumla	2531	17774	7010.9	19303	108921	15.54	43
64	Kalikot	1741	21528	14700.7	23013	136948	9.32	79
65	Mugu	3535	9174	6218.6	9619	55286	8.89	16
66	Humla	5655	8306	5232.1	9479	50858	9.72	9
67	Bajura	2188	22611	9413.1	24908	134912	14.33	62
68	Bajhang	3422	32446	11812.2	33786	195159	16.52	57
69	Achham	1680	44986	18488.6	48351	257477	13.93	153
70	Doti	2025	36840	16382.5	41440	211746	12.93	105
71	Kailali	3235	111662	66658.5	142480	775709	11.64	240
72	Kanchanpur	1610	70573	44352.9	82152	451248	10.17	280
73	Dadeldhura	1538	24797	11616.8	27045	142094	12.23	92
74	Baitadi	1519	43544	21326.7	45191	250898	11.76	165
75	Darchula	2322	22420	17378.5	24618	133274	7.67	57
	NEPAL	**1,47,181**	**3831093**	**2525639.2**	**5427302**	**26494504**	**10.49**	**180**

Source : CBS (Population Census 2011 and National Sample Census of Agriculture 2011/12)

Table 5.3 : Land use, Nepal, 1961/62 - 2011/12

Land use	Census year					
	1961/62	1971/72	1981/82	1991/92	2001/02	2011/12
	('000 hectares)					
Agricultural land	1626.40	1592.3	2359.2	2392.9	2497.7	2363.09
Arable land	1591.90	1567.00	2287.50	2324.30	2357.00	2162.14
Land under temporary crops	1550.50	1537.10	2250.20	2284.70	2326.10	2123.17
Other arable land	41.40	29.9	37.3	39.7	30.9	38.97
Land under permanent crops	12.20	15.0	29.2	29.4	117.5	168.45
Land under permanent pasturescrops	22.30	10.30	42.50	36.90	19.80	29.30
Ponds	n.a.	n.a.	n.a.	3.9	3.5	3.20
Non-agricultural land	59.00	61.80	104.50	205.00	156.40	161.91
Woodland and forest	13.80	4.70	15.00	108.80	37.20	54.89
Other land	45.2	57.1	89.5	96.2	119.2	107.02
Total area of holding	**1685.40**	**1654.00**	**2463.70**	**2597.40**	**2654.00**	**2522.52**
	Percentage distribution					
Agricultural land	96.5	96.3	95.8	92.1	94.1	93.7
Arable land	94.5	94.7	92.8	89.5	88.8	85.7
Land under temporary crops	92.0	92.9	91.3	88.0	87.6	84.2
Other arable land	2.5	1.8	1.5	1.5	1.2	1.5
Land under permanent crops	0.7	0.9	1.2	1.1	4.4	6.7
Land under permanent pasturescrops	1.3	0.6	1.7	1.4	0.7	1.2
Ponds	n.a.	n.a.	n.a.	0.2	0.1	0.1
Non-agricultural land	3.5	3.7	4.2	7.9	5.9	6.4
Woodland and forest	0.8	0.3	0.6	4.2	1.4	2.2
Other land	2.7	3.5	3.6	3.7	4.5	4.2
Total area of holding	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source : CBS, National Sample Census of Agriculture 2011/12

Table 5.4 : Land Use Pattern by District

(area in ha.)

S.N.	District	Total Forest Area	Shrub	Agricultural land/ grass	Water bodies	Barren land	Snow	Others	Total
1	Taplejung	112256	56362	70946	405	37757	60115	27496	365337
2	Panchthar	53182	14369	54078	181	326	29	0	122165
3	Ilam	72214	31649	64595	236	2873	0	0	171567
4	Jhapa	13239	1863	141795	778	6517	0	0	164192
5	Morang	43814	6040	126955	1374	4996	0	0	183179
6	Sunsari	21304	1508	91799	6262	6861	0	0	127734
7	Dhankuta	26324	14598	47350	549	982	0	0	89803
8	Terhathum	20033	12489	34917	129	494	0	0	68062
9	Sankhuwasabha	159872	48476	71335	975	23723	40825	0	345206
10	Bhojpur	61448	22207	66525	552	1284	0	0	152016
11	Solukhumbu	86002	49628	67424	571	59670	50037	19509	332841
12	Okhaldhunga	32363	15592	58858	352	729	0	0	107894
13	Khotang	61039	22571	74328	931	2020	0	0	160889
14	Udayapur	109404	15766	70005	1150	6587	0	0	202912
15	Saptari	30286	82	94397	3154	8169	0	544	136632
16	Siraha	20202	679	94268	818	4201	0	0	120168
17	Dhanusa	25773	1832	83617	1300	5158	0	0	117680
18	Mahottari	24086	1602	70897	1224	4836	0	0	102645
19	Sarlahi	21786	918	100624	488	2834	0	0	126650
20	Sindhuli	136302	25708	71842	1268	8442	0	0	243562
21	Ramechhap	48477	33076	67900	620	6149	3906	0	160128
22	Dolakha	78111	41194	54778	401	16031	22913	2985	216413
23	Sindhupalchok	92955	36017	67105	162	17404	32560	2679	248882
24	Kavre	46448	29511	67492	434	750	0	0	144635
25	Lalitpur	14620	8250	15553	125	999	0	0	39547
26	Bhaktapur	583	611	5440	1	316	0	0	6951
27	Kathmandu	12680	5219	22677	69	2375	0	0	43020
28	Nuwakot	42916	23526	48412	405	2405	1352	0	119016
29	Rasuwa	47494	15667	9443	54	8983	25138	44308	151087
30	Dhading	79205	31945	66322	745	4464	6382	0	189063
31	Makwanpur	137220	22578	75529	817	5696	0	0	241840
32	Rautahat	29076	563	78805	715	3332	0	0	112491
33	Bara	37974	1394	78480	298	1997	0	0	120143
34	Parsa	73131	922	63342	181	2513	0	0	140089
35	Chitawan	132746	6230	77280	2465	3696	0	0	222417
36	Gorkha	101158	52885	62886	497	23616	119141	0	360183
37	Lamjung	87552	22328	30999	607	9116	15162	0	165764
38	Tanahu	71949	18881	60850	1004	1410	49	0	154143
39	Syangja	51214	16685	45515	707	1293	74	0	115488
40	Kaski	89087	24881	28361	1803	10417	47308	0	201857
41	Manang	11760	20304	279	378	29828	165154	0	227703

Table 5.4 : Land Use Pattern by District

(contd...)

(area in ha.)

S.N.	District	Total Forest Area	Shrub	Agricultural land/ grass	Water bodies	Barren land	Snow	Others	Total
42	Mustang	16723	23587	285	272	78241	229295	10856	359259
43	Myagdi	67898	51574	16744	330	23035	70444	0	230025
44	Parbat	26189	7756	15371	141	735	7	0	50199
45	Baglung	91505	39702	21453	391	24612	1738	0	179401
46	Gulmi	51649	26853	36524	364	3033	80	0	118503
47	Palpa	72607	23736	44332	538	70	42		141325
48	Nawalparasi	89635	15210	104672	3260	9260	25	0	222062
49	Rupandehi	19897	3989	99894	1807	9063	0	0	134650
50	Kapilbastu	60500	2232	104141	2632	3951	0	0	173456
51	Arghakhanchi	69961	19414	24292	302	865	0	0	114834
52	Pyuthan	93042	3919	24587	526	8547	0	0	130621
53	Rolpa	150095	486	16458	67	19027	0	0	186133
54	Rukum	174725	2130	12961	130	77148	23253	0	290347
55	Salyan	143786	2610	36419	526	7337	0	0	190678
56	Dang	170124	8233	106934	1727	10343	0	0	297361
57	Banke	104269	9461	71475	1923	6296	0	0	193424
58	Bardiya	99364	5300	85809	2548	4756	0	0	197777
59	Surkhet	157687	33269	48653	1899	7556	0	0	249064
60	Dilekh	88699	20705	36341	167	8812	353	0	155077
61	Jajarkot	151306	1088	24126	489	43401	4095	0	224505
62	Dolpa	60603	3910	77	764	474881	249817	0	790052
63	Jumla	110531	1118	19819	338	98595	18566	0	248967
64	Kalikot	87165	3846	15560	0	48264	9588	0	164423
65	Mugu	87312	9387	20729	1360	139358	69568	0	327714
66	Humla	41051	21954	12584	677	112174	421759	0	610199
67	Bajura	72507	23982	31414	264	32110	63897	0	224174
68	Bajhang	92391	39713	43697	440	38826	139599	0	354666
69	Achham	99144	16967	45102	422	6219	154	0	168008
70	Doti	141848	17277	44839	311	2049	10	0	206334
71	Kailali	169708	14761	129769	2330	4715	0	0	321283
72	Kanchanpur	84420	2207	71938	1361	5680	0	0	165606
73	Dadeldhura	105937	11280	31359	212	1306	0	0	150094
74	Baitadi	72020	27751	46368	370	1229	0	0	147738
75	Darchaula	58177	31218	32902	591	30750	81568	0	235206
Total		**5599760**	**1283231**	**4061631**	**64664**	**1683493**	**1974003**	**108377**	**14775159**

Source: Department of Forest (Information System Development Project for the Management of Tropical Forest; Activity Report of Wide Area and Tropical Forest Resource Survey, March, 2001).

Table 5.5 : Change in Forest Covered Area in Tarai Districts (Excluding Protected Areas)

(area in ha)

S.N.	District	1990/91	2000/01	Change	% Change
1	Jhapa	21274	21000	-274	-1.29
2	Morang	45718	45184	-534	-1.17
3	Sunsari	21659	21365	-294	-1.36
4	Saptari	21054	21110	56	0.27
5	Siraha	19021	18278	-743	-3.91
6	Dhanusa	28876	28323	-553	-1.92
7	Mahottari	23587	24181	594	2.52
8	Sarlahi	30037	30528	491	1.63
9	Rautahat	29472	29559	87	0.3
10	Bara	49632	49157	-475	-0.96
11	Parsa	18904	18644	-260	-1.38
12	Chitawan	61677	63586	1909	3.1
13	Nawalparasi	91026	93171	2145	2.36
14	Rupandehi	27305	26524	-781	-2.86
15	Kapilbastu	64579	62211	-2368	-3.67
16	Dang	191200	194262	3062	1.6
17	Banke	113074	110820	-2254	-1.99
18	Bardiya	35491	33719	-1772	-4.99
19	Kailali	210413	205939	-4474	-2.13
20	Kanchanpur	54546	51933	-2613	-4.79
	Total	**1158545**	**1149494**	**-9051**	**-0.78**

Source : Department of Forest, 2005, (Forest Covered Change Analysis of the Tarai Districts 1990/91-2000/01)

Table 5.6 : Estimated coverage by different types of wetlalnds in Nepal

S.N.	Wetland Types	Estimated Coverage	
		Area (ha.)	Percent (%)
1	Rivers	395000	48.2
2	Lakes	5000	0.6
3	Reservoirs	1500	0.2
4	Ponds	7277	0.9
5	Marginal swamps	12500	1.5
6	Irrigated paddy fields	398000	48.6
Total		**819277**	**100**

Source : Directorate of fisheries Development (2012)

Table 5.7 : Sediment Yield in Large Watersheds

Watersheds	Watersheds Area (sq. km)	Sediment Delivery (ton/ha/yr)
Tamor	5770	38.0 (1)
	5700	70.0 (6)
	5900	80.0 (4)
	5770	38.0 (5)
Sunkoshi	18985	21.0 (1)
	19000	65.0 (3)
	19000	45.0 (4)
Bagmati	585	45.0 (6)
Trisuli	4100	18.0 (6)
	4110	18.5 (3)
Karnali	42890	21.0 (9)
Nagmati	1388	46.0 (3)
Ganges	1076000	13.5 (8)
Saptakosi	59280	15.0 (1)
	62000	27.7 (8)
	6100	31.0 (7)
	59280	15.0 (5)
Arun	34525	7.6 (1)
	36000	16.0 (7)
	36533	(4)
	34525	7.6 (5)

Reference : Impat-1979; Sherchan-1991; Schaffner-1987; Upadhaya-et.al. 1991; Ries- 1994; Maskey and Joshy- 1991; Karver-1995; Erl – 1988; HPC-1989.

Source : Water and Energy Commission Secretariat/ CIDA.(Himalayan Sediment, Issue and Guidelines, 2003).

Table 5.8 : Sediment Yield in Small Watersheds

Watersheds	Watersheds Area (sq. km)	Sediment Delivery (ton/Ha/yr)
Lahore River	63	6.8 (1)
Bamti Khola	8	13.3 (2)
Chhukarpo Khola (up)	23.5	29.8 (2)
Chhukarpo Khola (down)	369	3.7 (2)
Surma Khola	570	2.1 (2)
Harpan Khola (Phewa Tal)	12000	8.9 (9)
Kukhuri khola	75	17.0 (11)
Anderi Khola	540	15.0 (11)
Jhinkhu	11141	11.0 (11)
Sunsdarizal	1553	12.9 (3)
Godavari	1231	3.3 (3)
Bishnumati	614	10.7 (3)
Mahabharat 1 Check dams	19	29.0 (4)
Kulekhani (re - 1993)	12500	20.45 (10)

Reference : Impat-1979; Sherchan-1991; Schaffner-1987; Upadhaya-et.al. 1991; Laban-1978; Mulder- 1978; Carson- 1985.

Source : Water and Energy Commission Secretariat/CIDA (Himalayan Sediment, Issue and Guidelines 2003).

Table 5.9 : Affected Land Area from Erosion

S.N.	Degradation Type	Affected Area (million ha.)	Affected Area as % of Total Land Area of Nepal
1	Water erosion	6.7	45.4
2	Wind erosion	0.6	4
3	Chemical deterioration n	0.3	1.7
4	Physical deterioration	0.2	1.3

Sources: Ministry of Environment, Science and Technology, 2008.

Table 5.10 : Estimated Soil Erosion Rate at Selected Sites in Nepal

Area	Location and Characteristics	land Use	Erosion Rate (ton /sq. km/yr.)
Siwalik Range	Eastern Nepal, South aspect, sand stone foot hills	Different land use ranging from forest to grazing	780 - 3680
	Far Western Nepal, South aspect sand stone foot hills of Surkhet	a. Degraded land	2000
		b. Degraded forest,gullied land	4000
		c. Severely degraded heavily grazed forest, gullied land	20000
Mahabharat Lekh	Central Nepal, steep slope on Metamorphic and Sedimentary Rocks	a. Degraded forest and agriculture land	3150 - 14000
		b. Gullied land	6300 - 42000
Middle Mountain	Northern foot hills of Katmandu Valley	a. Degraded forest & shrub land	2700 - 4500
		b. Over grazed shrub land	4300
		c. Severely gullied land	12500 - 57000
	South of Katmandu Valley	75 percent dense forest	800
	Phewa Watershed	a. Protected pasture	920
		b. Overgrazed grass land	2200 - 34700
		c. Gullied overgrazed grass land	2900

Source: Central Bureau of Statistics (A Compendium on Envrronment Statistics 1998 Nepal)

Table 5.11 : Area of Land made uncultivabe due to flooding /Soil Erosion by Ecological Belt and Development Region, Nepal, 2011/12

(area in ha.)

Area	Total Area (ha)	Affected Area (ha)	Percentage of affected area	Types of Soil Degredation		
				Soil Erosion	Chemical Degradtion	Physical Degredation
ECOLOGICAL BELT						
Mountain	213931.50	3512.30	1.64	1848.60	32.10	1631.60
Hill	986073.20	18764.50	1.90	11679.60	414.90	6670.00
Terai	1325634.50	34394.90	2.59	23643.40	1485.50	9266.00
Total	**2525639.20**	56671.70	2.24	**37171.60**	**1932.50**	**17567.60**
DEVELOPMENT REGION						
Eastern	755178.00	14789.00	1.96	8407.00	294.00	6088.00
Central	716861.00	19841.00	2.77	13808.00	869.00	5164.00
Western	482547.00	8517.00	1.77	6135.00	193.00	2189.00
Midwestern	353624.00	5214.00	1.47	3791.00	129.00	1294.00
Farwestern	217430.00	8310.00	3.82	5030.00	447.00	2833.00
Total	**2525640.00**	56671.00	2.24	**37171.00**	**1932.00**	**17568.00**

Source: Central Bureau of Statistics (National Sample Census of Agriculture, Nepal 2011/12).

Table 5.12 : Type and Color of Soil by Area of Holdings and by Development Region, Nepal, 2001/02

(Area of holding in ha.)

S.N.	Type and Color of Soil	Nepal		Eastern Development Region		Central Development Region		Western Development Region		Mid -Western Development Region		Far-Western Development Region	
		Area of holding (ha)	Percent to total	Area of holding(ha)	Percent to total	Area of holding(ha)	Percent to total	Area of holding (ha)	Percent to total	Area of holding (ha)	Percent to total	Area of holding (ha)	Percent to total
Soil Type													
1	Sand	589455	25.4	198604	26.9	143885	27.1	85893	18.0	92983	25.6	68091	32.3
2	Loam	884697	38.1	273424	37.0	204719	38.5	174045	36.5	140687	38.8	91822	43.6
3	Silt	167822	7.2	53289	7.2	36094	6.8	28316	5.9	35415	9.8	14708	7.0
4	Clay	532488	22.9	171696	23.2	119527	22.5	144043	30.2	70175	19.3	27047	12.8
5	Clay Loam	145777	6.3	41692	5.6	27212	5.1	44381	9.3	23467	6.5	9025	4.3
Total		**2320239**	**100.0**	**738704**	**100.0**	**531437**	**100.0**	**476678**	**100.0**	**362727**	**100.0**	**210693**	**100.0**
Soil Color													
1	Black	825307	35.6	263073	35.6	173058	32.6	163488	34.3	147848	40.8	77841	36.9
2	Brown	939299	40.5	330750	44.8	214421	40.3	171923	36.1	134623	37.1	87583	41.6
3	Yellow	215460	9.3	57059	7.7	55618	10.5	53487	11.2	35728	9.8	13568	6.4
4	Red	283687	12.2	74556	10.1	70311	13.2	78762	16.5	39307	10.8	20751	9.8
5	Other	56485	2.4	13266	1.8	18029	3.4	9019	1.9	5221	1.4	10951	5.2
Total		**2320239**	**100.0**	**738704**	**100.0**	**531437**	**100.0**	**476678**	**100.0**	**362727**	**100.0**	**210693**	**100.0**

Source: Central Bureau of Statistics (National Sample Census of Agriculture, Nepal, 2001/02).

Table 5.13 : Livestock and Poultry Population in Arid and Semi-Arid Land

Year	Cattle		Buffaloes		Sheep		Goats		Pigs		Fowls		Ducks	
	Population	p/land*	Population	p/land*	Population	p/land*	Population	p/land*	Population	p/land*	Population	p/land*	Population	p/land*
1994/95	6837913	116	3278255	56	918885	16	5649056	96	636024	11	14063581	239	403705	10
1995/96	7008420	119	3302200	56	859000	15	5783140	98	670340	11	14521100	247	416100	11
1996/97	7024775	119	3362435	57	869582	15	5921956	101	723613	12	15576525	265	415758	11
1997/98	7048660	120	3419150	58	869142	15	6080060	103	765718	13	16664730	283	416943	11
1998/99	7030698	119	3470600	59	855159	15	6204616	105	825132	14	17796826	302	421423	11
1999/00	7023166	119	3525952	60	851913	14	6325144	107	877681	15	18619636	316	425160	11
2000/01	6982660	119	3624020	62	850170	14	6478380	110	912530	15	19790060	336	411410	11
2001/02	6978690	119	3700864	63	840141	14	6606858	112	934461	16	21370420	363	408584	11
2002/03	6953584	118	3840013	65	828286	14	6791861	115	932192	16	22260700	378	408311	11
2003/04	6966436	118	3952654	67	824187	14	6979875	119	935076	16	23023979	391	405217	10
2004/05	6994463	119	4081463	69	816727	14	7153527	122	947711	16	22790224	387	391855	10
2005/06	7002916	119	4204886	71	812085	14	7421624	126	960827	16	23221439	394	392895	10
2006/07	7044279	120	4366813	74	813621	14	7847624	133	989429	17	23924630	406	394798	10
2007/08	7090714	120	4496507	76	809480	14	8135880	138	1013359	17	24665820	419	390748	10
2008/09	7175198	122	4680486	80	802993	14	8473082	144	1044498	18	24481286	416	383123	10
2009/10	7199260	122	4836984	82	801371	14	8844172	150	1064858	18	25760373	438	379753	10
2010/11	7226050	123	4995650	85	805070	14	9186440	156	1093610	19	39530540	671	378050	10
2011/12	7244944	123	5133139	87	807267	14	9512958	162	1137489	19	NA		376916	10
2012/13	7274022	124	5241873	89	809536	14	9786354	166	1160035	20	NA		375975	10

** Arid land /semi arid land= Cultivated land, Non cultivated land and Grass land/Pasture estimated area 58873.3 sq. km.*

NA : Not Available

Source: Ministry of Agriculture Developments

Table 5 .14 : Number of Livestock by Type in Nepal,1981/82-2011/12

S.N.	Livestock type	Number of Livestock (in 'ooo)				Percentage change		
		1981/82	1991/92	2001/02	2011/12	1991/1981	2001/1991	2011/2001
1	Cattle	6501.6	7359.3	7215.2	6430.4	13.2	-2.0	-10.9
2	Chaunri	55.5	58.6	95.4	48.9	5.6	62.8	-48.8
3	Buffaloes	2379.7	3116.3	3477.7	3174.4	31.0	11.6	-8.7
4	Goats	3643.7	5515.5	6932.9	10990.1	51.4	25.7	58.5
5	Sheep	677.1	602.8	471.2	608.1	-11.0	-21.8	29.0
6	Pigs	433.6	495.8	632.6	818.5	14.3	27.6	29.4
7	Horses	NA	14.3	20.1	17.9	0.0	40.6	-11.1
8	Mules and asses	27.5	5.3	6	5.5	-80.7	13.2	-9.0
9	Rabbits	NA	NA	10.1	24.2	0.0	0.0	140.0
10	Other animals	36.8	7.3	5.9	17.1	-80.2	-19.2	189.6
11	Chickens	7368.6	12333.1	17631.3	26267.8	67.4	43.0	49.0
12	Ducks	142.3	280.3	393.1	429.9	97.0	40.2	9.4
13	Pigeons	830.7	1419.9	1845.2	1498.9	70.9	30.0	-18.8
14	Other poultry	20.4	9.2	57.3	52.1	-54.9	522.8	-9.1
	Total	22117.5	31217.7	38794	50383.8	41.1	24.3	29.9

Source:Central Bureau of Statistics (Monograph Agriculture Census Nepal,2001/02), National Report Of National sample census of Agriculture 2011/12

Table 5.15 : Area of Land made uncultivabe due to flooding /Soil Erosion by Ecological Belt and Development Region,Nepal, 2001/02

(area in Ha.)

Geographical Area	Total Area of Holding	Land made uncultivable due to flooding /soil erosion	
		Affected Area	% of affected area to total area
Nepal	**2654037.2**	**30845.3**	1.2
Ecological Belt			
Mountain	218706.6	**1495.0**	0.7
Hill	1038614.5	**6220.3**	0.6
Tarai	1396716.1	**23130.0**	1.7
Development Region			
Eastern	795521.4	**9976.3**	1.3
Central	750212.9	**11213.1**	1.5
Western	512152.2	**6881.2**	1.3
Mid-Western	370701.9	**1595.3**	0.4
Far -Western	225448.8	1179.4	0.5

Source: CBS(National Sample Census of Agriculture, Nepal 2001/02).

Table 5.16: Irrigated Land by source of Irrigation, 2011/12

Area	Total Area (ha)	Irrigated Area (ha)	Source of Irrigatin					
			River/Lake/Pond		Dam/reservoir	Tube well/boring	Others	Mixed
			By gravity	Pumping				
ECOLOGICAL BELT								
Mountain	213.93	58.38	53.39	1.03	1.57	0.00	2.18	0.20
Hill	986.07	270.27	210.46	4.93	24.06	1.47	27.30	2.05
Terai	1325.63	984.76	250.23	107.00	182.51	390.38	26.20	28.44
Total	**2525.64**	**1313.41**	**514.08**	**112.97**	**208.14**	**391.85**	**55.69**	**30.69**
DEVELOPMENT REGION								
Eastern	755.18	394.39	181.09	18.26	41.60	131.98	15.82	5.65
Central	716.86	429.55	126.97	53.58	74.54	139.83	15.94	18.61
Western	482.55	209.77	83.30	28.70	21.41	57.32	14.76	4.28
Midwestern	353.62	152.52	56.61	6.48	55.45	27.12	6.19	0.66
Farwestern	217.43	127.27	66.12	5.95	15.13	35.60	2.98	1.50
Total	**2525.64**	**1313.50**	**514.08**	**112.97**	**208.14**	**391.85**	**55.69**	**30.69**

Source: Central Bureau of Statistics (National Sample Censuses of Agriculture, 2011/12)

Table 5.17 : Area under Permanent Crops

Permanent Crop	Compact area ('000 in ha.)				
	1981/82	1991/92	2001/02	2011/12	% Increase 2001-2011
Orange	0.60	2.40	3.20	5.96	86.3
Lemon	0.40	0.40	0.62	0.39	-37.0
Lime	0.40	0.20	0.29	0.21	-29.8
Junar	-	-	-	0.20	na
Sweet Oranges	0.10	-	0.23	0.11	-51.2
Other Citrus fruit	0.20	0.40	0.34	0.40	17.3
Mangoes	5.20	15.20	18.48	17.95	-2.9
Bananas	4.00	2.10	3.14	4.90	56.1
Guavas	1.10	0.40	0.48	0.39	-18.8
Jackfruit	1.80	0.60	0.68	0.43	-35.9
Pineapples	0.40	0.20	0.23	0.28	21.6
Lychees	0.10	0.30	0.78	1.38	77.7
Pears	0.20	0.10	0.35	0.25	-29.1
Apples	NA	0.60	1.38	1.71	24.0
Plums / Peach	NA	0.10	0.45	0.15	-65.7
Papayas	0.70	0.10	0.30	0.19	-38.2
Pomegranate	-	0.10	0.09	0.04	-50.2
Coconut	-	-	-	0.09	na
Walnut	-	-	-	0.18	na
Betel Nut	-	-	-	1.78	na
Other fruit	14.00	2.70	1.70	0.67	-60.7
Tea	NA	3.50	6.20	5.19	-16.3
Coffee	-	-	-	0.41	na
Black Carvamon	-	-	-	14.28	na
Thatch	NA	66.40	67.60	78.99	16.8
Fodder Tree	NA	2.50	7.30	9.35	28.1
Bamboo	NA	6.00	6.30	7.23	14.8
Multi year grass crops	-	-	-	2.49	na
Broom Grass (Amrisho)	-	-	-	12.86	na

na = not applicable
Source : Central Bureau of Statistics (National Sample Censuses of Agriculture, Nepal, 2011/12).

Table 5.18 : Area Under Selected Temporary Crops

S.N.	Selected Crops	Crop Area ('000 Ha)			
		1981/82	1991/92	2001/02	2011/12
1	Paddy	1394	3252	3423	1456
2	Wheat	389	633	794	749
3	Maize	523	769	769	674
4	Millet	154	302	251	201
5	Barley	28	46	39	26
6	Buckwheat	11	16	21	13
7	Other Cereals	NA	5	5	4
8	Legumes	335	340	379	298
9	Tubers	86	79	93	111
10	Cash Crops	86	63	61	68
11	Oilseeds	224	260	214	186
12	Spices	58	29	41	44
13	Vegetables	17	40	60	84
14	Temp. Grass Crops	NA	NA	NA	9

Source: Central Bureau of Statistics (National Sample Censuses of Agriculture, Nepal)

Table 5.19 : List of Banned Pesticides in Nepal

S.N.	Name of Pesticide	S.N.	Name of Pesticides
1	Chlordane	8	Mirex
2	DDT	9	BHC
3	Dieldrin	10	Lindane
4	Endrin	11	Phosphamidon
5	Aldrin	12	Orano mercury fungicides
6	Heptachlor	13	Methyl parathion
7	Toxafen	14	Monocrotophos
15	Endosulphan*		

** Persistent Organic Pollutant; Deregisterd in 2069/7/20, grace period for sell and use till 2071/7/19*

Source: Pesticide Registration and Management Section

Table 5.20 : Classification of registered pesticides (WHO, 2004)

S.N.	Hazard level	WHO group	Pesticides (Technical)
1	Extremely hazardous	Ia	0
2	Highly hazardous	Ib	53
3	Moderately hazardous	II	541
4	Slightly hazardous	III	219
5	Unlikely to present acute hazard in normal use	NH	258
6	Not calculated	NC	27
Total			**1098**

Source: Pesticide Registration and Management Section

Table 5.21 : Pesticides Registered in Nepal

S.N.	Pesticide	Number of Trade Name						
		1997*	2002+	2003+	2004+	2009	2010	2013
1	Insecticides	46	207	213	213	210	391	613
2	Herbicides (Weedicides)	9	22	23	23	24	63	120
3	Fungicides	17	71	71	71	62	170	304
4	Acaricides	1	2	2	2	–	–	12
5	Rodenticides		8	8	8	9	7	18
6	Bio- Pesticides	–	–	–	–	13	16	23
7	Bactericides						4	7
8	Molluscicide							1
9	Others	5	2	2	2	8	–	–
Total		**78**	**312**	**319**	**319**	**326**	**651**	**1098**

**Nepal Gazette vol.47, No. 11 (1997).+Updated Registration List of the Pesticide.*
Source :Pesticide Registration and management Section

Table 5.22 : Chemical Fertilizer Use in Nepal,1990/00 to 2012/13

Year	Government Sector				Private Sector	Total Fertilizer	Nutrient mt / Cultivated Land ha*100
	Urea	DAP	Potash	Complex			
1999/00	43508	26154	308		76727	146697	4.75
2000/01	29528	15633	58		101145	146364	4.74
2001/02	17697	20645	1016		101140	140498	4.55
2002/03	34449	33331	2966		103636	174382	5.64
2003/04	7428	11377	1688		118265	138758	4.49
2004/05	10043	19436	2332		90895	122706	3.97
2005/06	1960	10857	478		78258	91553	2.96
2006/07	14985	7437	NA		65679	88101	2.85
1999/00	43508	26154	308		76727	146697	4.75
2000/01	29528	15633	58		101145	146364	4.74
2001/02	17697	20645	1016		101140	140498	4.55
2002/03	34449	33331	2966		103636	174382	5.64
2003/04	7428	11377	1688		118265	138758	4.49
2004/05	10043	19436	2332		90895	122706	3.97
2005/06	1960	10857	478		78258	91553	2.96
2006/07	14985	7437	–	2747	65679	90848	2.94
2007/08	2500	1990	–	2156	47107	53753	1.74
2008/09	5935	–	–	1198	5677	12810	0.41
2009/10	5049	2523	236	2521	NA	–	–
2010/11	85190	22001	2821	–	NA	–	–
2011/12	91500	20000	–	–	NA	–	–
2012/13	140000	40000	5000	–	NA	–	–

Note : The Cultivated land (3090780 ha) based on Department of Forest Research and Survey, 2001.
Source: Ministry of Agriculture and Cooperatives and Agriculture Inputs Company Ltd.

Table 5.23 : Pesticide Imported and Formulated in Nepal, 2006-2012

S.N.	Kinds of Pesticide	Quantity of Pesticides Imported															
		2006/07	2007/08			2008/09			2009/10			2010/11			2011/12		
		Total Active Ingredints (kg.)	Formulations		Total Active Ingredints (kg.)	Formulations		Total Active Ingredints (kg.)	Formulations		Total Active Ingredints (kg.)	Formulation		Total Active Ingredints (kg.)	Formulation		Total Active Ingredints (kg.)
			Liquid (Ltr.)	Solid (kg.)		Liquid (Ltr.)	Solid (kg.)		Liquid (Ltr.)	Solid (kg.)		Liquid (Ltr.)	Solid (kg.)		Liquid (Ltr.)	Solid (kg.)	
1	Insecticides	46553.25	94234.45	165767.6	60282.42	99095.38	179051	105814.6	132278	181191.5	61615.8	220631.5	308343.5	96115.325	221059.1	326073.5	114717.7
1.1	Organochlorine	8214.5	31560	0	11046	32582.59	0	11403.9	31485	0	11019.8	40059	280	14031.85	29820	0	10437
1.2	Organo-phospates	24682.6	15904.95	94749	17709.05	16415.49	95745	65838.2	42884	10765	23280.3	71924.5	17595	40148.42	96603	39360	60497.48
1.3	Carbamates	115.4	25	7545	321.05	205.6	7654	1100.34	650	31363	1344.15	669	48233	2127.95	971.5	85800	2847.97
1.4	Synthetic Pyrethroids	2640.43	21851.95	20063	4592.66	22581.8	19941	7228.88	40634	19600	5255.65	72498	15300	9313.615	49999.6	3137.712	6101.777
1.5	Botanical products	4.31	1430	0	2.15	0	0	0	0	0	0	0	0	0	0	0	0
1.6	Mixed Insecticides	2290.35	10592.55	200	3625.25	13529.9	1276	6736.68	13760	0	7284.3	32053	450	16463.24	35515	130	18069.04
1.7	Others	8605.66	12870	43210.6	22986.26	13780	54435	13506.6	2865	119463.5	13431.6	3428	226485.5	14030.25	8150	197645.8	16764.45
2	Herbicides	5701.7	12523	7308	6574.05	20195.15	11956	11124.3	37452	5111	15683.1	88160	20738	46696	108478	7871.2	53476.66
3	Fungicides	74368.45	5900	326004.6	237372.2	86874.45	324018	203392	5575	176790	129567	4590	258016	183893.02	6536	226901	166815.4
4	Rodenticides	1808	70503	43600	37297.75	0	38617.2	31086.9	0	3085	2468	0	8310	5528.07	0	24360	8183.107
5	Bio-Pesticides	57.58	0	3810	57.12	129.8	4293.81	30.08	2099	5134	82.08	2997	4229	78.26	7230	9823	121.687
6	Acaricides	238.65	5612	0	2458.06	5511	0	2080.4	220	0	38	3170	0	1085.25	7910	0	1424.1
7	Bactericides	0	250	0	750	45.9	20.49	6.64	0	250	25	0	16	1.6	0	0	0
8	Others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2000	120
Agricultural Pesticides		**128727.63**	**189022.5**	**546490.2**	**344791.6**	**211851.68**	**557956.5**	**353534.92**	**177624**	**371561.5**	**209478.98**	**319548.5**	**599652.5**	**333397.525**	**351213.1**	**597028.7**	**344858.7**
Pesticides usedin Public Health		**2556.8**	**0**	**27030**	**2703**	**0**	**28110**	**2811**	**0**	**32000**	**1600**	**0**	**45520**	**2276**	**995**	**1100**	**174**
Grand Total		**131284.43**	**189022.5**	**573520.2**	**347494.6**	**211851.68**	**586066.5**	**356345.92**	**177624**	**403561.5**	**211078.98**	**319548.5**	**645172.5**	**335673.525**	**352208.1**	**598128.7**	**345032.7**

Source: Pesticide Registration and Management Section

Table 5.24 : Farm population 1991/92 - 2011/12

Discription	Census year		
	1991/92	2001/02	2011/12
Total household*****	3328721	4253220	5427302
Total holding	2736050	3364139	3831093
Percentage of holding	82	79.1	70.6
Total Population***			
Male	9220974	11563921	12849041
Female	9270123	11587502	13645463
Total	18491097	23151423	26494504
Sex ratio	99.5	99.8	94.2
Farm population			
Male	8496843	10267646	10317681
Female	7761377	9544003	10234862
Total	16258220	19811649	20552543
Percentage of the total population			
Male	52.3	51.8	50.2
Female	47.7	48.2	49.8
Total	87.9	85.6	77.6
Sex ratio of farm population	109.5	107.6	100.8
Average size of farm household	5.9	5.9	5.4

***** *Population Census*

Source: CBS

Chapter VI

Water

Table 6.1 : Supply of Drinking Water by Agency

Year	Unit	Water Supply				
		DWSS		NWSC	KUKL	Total
		Total	Urban Area Only			
1993/94	Th. L/d	46948	1736	16000		64684
1994/95	Th. L/d	54471	4608	3300		62379
1995/96	Th. L/d	54067	3880	5500		63447
1996/97	Th. L/d	34650		5500		40150
1997/98	Th. L/d	31815		300		32115
1998/99	Th. L/d	20011		7000		27011
1999/00	Th. L/d	28271		3000		31271
2000/01	Th. L/d	25164		1480		26644
2001/02	Th. L/d	2876		7000		9876
2002/03	Th. L/d	5552		5000		10552
2003/04	Th. L/d	8550		3000		11550
2004/05	Th. L/d	5580		4000		9580
2005/06	Th. L/d	7200	1000	18100		26300
2006/07	Th. L/d	22500	8000	3000		33500
2007/08	Th. L/d	19545	28600	7500	101900*	55645
2008/09	Th. L/d	15615	21120	125000		
2009/10	Th. L/d	16605	1040	129440	119160	
2010/11	Th. L/d			135033	118880	
2011/12	Th. L/d			168305	117300	
2012/13	Th. L/d			155125		

* Water supply in dry season, + KUKL

Source: Department of Water Supply and Sewerage (DWSS), Nepal Water Supply Corporation (NWSC) and Kathmandu Upatyaka Khanepani Ltd .(KUKL).

Table 6.2 : Mineral Contaminants of Drinking Water, 2009/10

Parameters	Unit	Maximum	Minimum	Mean
pH(25ºC)	-	9.8	4.0	6.9
Total dissolved solid (25ºC)	ppm	544.1	9.99	44.23
Ammonia(Qlt- test)	-	+ve	Abs	-
Sulphate (Qlt- test)	-	-	-	-
Hardness as CaCO3	ppm	84.0	6.0	32.84
Alkalinity as HCO3	ppm	213.5	24.4	41.23
Iron	ppm	1.96	ND	0.018
Chloride	ppm	32.0	6.0	17.1
Calcium	ppm	ND	-	-
Magnesium	ppm	-	-	-
Zinc (mg/l)	ppb	-	-	-
Lead (mg/l)	ppb	-	-	-
Cadmium	ppb			
Arsenic	ppb	ND	ND	ND
S1/S2 =251/66				

ND : Not defined.,ppb:parts per billion,ppm:parts per million,Qlt=Qualitative test

Source : Department of Food Technology and Quality Control -2009/10.

Table 6.3 : Ground Water Quality of (Shallow Tube) Aquifers in the East Tarai, 2003

Site (District)	Chloride (mg/l)	Ammonia (mg/l)	Nitrate (mg/l)	Iron (mg/l)	Manganese (mg/l)	Coliform (cfu/100 ml)
Panchgachhi (Jhapa)	15.4	0.7	0.2	6	0.8	1.1
Baijanathpur (Morang)	16.6	0.5	0.2	4.5	0.5	15.9
Bayarban (Morang)	17.6	0.5	2.4	6	0.6	0.5
Takuwa (Morang)	21	1	1	10.4	0.4	45.9
Shreepur Jabdi (Sunsari)	37.2	0.9	0.2	8	0.6	25.5
Bandipur (Sunsari)	195.6	0.7	3.5	0.4	0.4	1
Naktiraipur (Saptari)	45.6	1.2	0.3	12	1.3	16
WHO Guideline	**250**	**1.24**	**10**	**3**	**0.5**	**nil**

Source: Environment and Public Health Organization 1999 and United Nations Environment Program, 2000.

Table 6.4 : Percentage Distribution of Households using Main Sources of Drinking Water, Nepal, 2011

Area	Total Households	Main Source of Drinking Water (%)							
		Tap/Piped	Tubewell/hand pump	Covered well/kuwa	Uncovered well/kuwa	Spout water	River/stream	Others	Not Stated
Nepal	5423297	47.78	35.13	2.45	4.71	5.74	1.12	2.44	0.63
Ecological Belt									
Mountain	363698	76.5	0.0	0.7	3.0	16.1	2.6	0.5	0.5
Hill	2532041	72.0	3.1	3.5	6.2	9.2	1.6	3.9	0.5
Terai	2527558	19.3	72.3	1.7	3.5	0.7	0.5	1.2	0.7
Development Region									
Eastern	1230743	36.1	52.9	0.8	4.5	3.5	0.7	0.9	0.5
Central	1962238	48.0	33.7	3.6	4.4	3.7	0.6	5.2	0.8
Western	1065599	64.3	22.2	2.1	3.9	5.6	0.7	0.7	0.5
Mid Western	695014	47.5	24.5	3.1	8.0	12.6	2.9	0.9	0.5
Far Western	469703	40.3	39.8	1.6	3.4	10.2	2.8	1.2	0.6
Place of Residence									
Urban	1045575	59.2	24.5	3.4	1.6	2.9	0.3	7.4	0.7
Rural	4377722	45.1	37.7	2.2	5.4	6.4	1.3	1.3	0.6

Source: Central Bureau of Statistics,Population Census 2011, National Report

Table 6.5 : Percentage Distribution of Households by Toilet Facility, Nepal, 2011

Area	Total Households	Type of Toilet Facilities (%)				
		Flush toilet (public sewerage)	Flush toilet (septic tank)	Ordinary toilet	Without toilet	Not Stated
Nepal	5,423,297	8.3	33.5	19.5	38.2	0.6
Ecological Belt						
Mountain	363,698	0.4	26.8	32.4	39.9	0.5
Hill	2,532,041	16.4	37.0	21.3	24.9	0.5
Terai	2,527,558	1.3	30.9	15.8	51.2	0.8
Development Region						
Eastern	1,230,743	1.5	28.6	29.6	39.7	0.6
Central	1,962,238	20.5	28.9	13.7	36.1	0.9
Western	1,065,599	1.4	51.7	19.4	27.0	0.5
Mid Western	695,014	1.0	29.3	20.6	48.6	0.5
Far Western	469,703	1.0	30.0	15.7	52.7	0.6
Place of Residence						
Urban	1,045,575	30.2	47.5	12.4	9.1	0.8
Rural	4,377,722	3.0	30.1	21.2	45.1	0.6

Source: Central Bureau of Statistics (Population Census 2011 : National Report)

Table 6.6 : Summary of Known Arsenic Occurrence in Tarai Districts, FY 2010/11

S.N.	District	Tube wells by arsenic concentration levels							
		0-10ppb		11-50ppb		>50ppb		Total	
		Number	%	Number	%	Number	%	Number	%
1	Banke	23796	97.01	568	2.32	166	0.68	24530	2.26
2	Bara	34444	89.26	2689	6.97	1456	3.77	38589	3.56
3	Bardiya	38243	89.15	2484	5.79	2170	5.06	42897	3.96
4	Chitwan	57232	99.74	104	0.18	46	0.08	57382	5.29
5	Dang	26040	99.26	153	0.58	41	0.16	26234	2.42
6	Dhanusa	54388	96.21	1724	3.05	419	0.74	56531	5.22
7	Jhapa	113077	99.34	699	0.61	53	0.05	113829	10.50
8	Kailali	74357	88.30	7009	8.32	2839	3.37	84205	7.77
9	Kanchanpur	47633	88.90	4365	8.15	1580	2.95	53578	4.94
10	Kapilbastu	36031	90.76	2508	6.32	1160	2.92	39699	3.66
11	Mahottari	33546	98.91	341	1.01	29	0.09	33916	3.13
12	Morang	109653	98.12	1950	1.74	155	0.14	111758	10.31
13	Nawalparasi	24136	76.20	3836	12.11	3704	11.69	31676	2.92
14	Parsa	26550	92.13	1598	5.54	671	2.33	28819	2.66
15	Rautahat	39351	80.74	8305	17.04	1084	2.22	48740	4.50
16	Rupandehi	69950	96.21	2283	3.14	470	0.65	72703	6.71
17	Saptari	53070	94.65	2445	4.36	557	0.99	56072	5.17
18	Sarlahi	42905	85.02	6952	13.78	609	1.21	50466	4.66
19	Siraha	38608	84.66	5823	12.77	1172	2.57	45603	4.21
20	Sunsari	63903	95.86	2343	3.51	418	0.63	66664	6.15
Total		**1006913**	**92.90**	**58179**	**5.37**	**18799**	**1.73**	**1083891**	**100.00**

Source: Department of Water Supply and Sewerage.

Table 6.7: River Water Runoff from Nepal

S.N.	River	Length (km)	Drainage Area (sq.km)		Estimated Runoff (m^3/sec)	
			Total	Nepal	From all Basins	From Nepal
1	Mahakali	223	15260	5410	698	247
2	Karnali	507	44000	41890	1441	1371
3	Babai	190	3400	3400	103	103
4	West Rapti	257	6500	6500	224	224
5	Narayani	332	34960	28090	1753	1409
6	Bagmati	163	3700	3700	178	178
7	Sapta Koshi	513	60400	31940	1658	878
8	Kankai	108	1330	1330	68	68
9	Other River		24921	24921	1001	1001
Total			194471	147181	7124	5479

Source : Water and Energy Commission Secretariat (Water Resources of Nepal in the context of Climate Change,2011)

Table 6.8 : Deep Aquifer Depletion in Selected Locations During Dry Season of Kathmandu Valley

Location	Water Level (m)				Decline (m)	
	1976		1999			
	SWL	PWL	SWL	PWL	SWL	PWL
Bansbari	48.08	67.6	80.63	136.14	32.55	68.54
Baluwatar	F.W.	21	22.41	30	22.41	9
Pharping	F.W.	25	13	44	13	19

SWL=Static water level, PWL= Pumping water level,, F.W.= Flowing well.

Source : Centre for Environment and Management (2000), Metcalf and Eddy (2000).

Table 6.9 : Glaciers and Catchments Areas having Meteorological and Hydrological Stations

(Latitude and Longitude in degree and minute)

Name of Glacier	Catchments Areas (sq. km)	River Basin	Major Glacier	Meteorological Station			Hydrological Station		
				Latitude	Longitude	Altitude	Latitude	Longitude	Altitude
				North	East	(masl)	North	East	(masl)
Makalu, Tashigaon	240	Barun	Barun	27^0 37'	87^0 16'	2100	27^0 44'	87^0 11'	2000
Khumbu	135			27^0 53'	86^0 49'	4355	27^0 53'	86^0 56'	4355
a) Dingboche		Imja	Imja						
b) Pangboche		Imja	Imja						
Langtang, Kyangjing	340	Langtang	Langtang	28^0 13'	85^0 37'	3920	28^0 13'	85^0 33'	3800
Annapurna Machhapuchhre	148	Modi	Annapurna Glacier	28^0 32'	83^0 57'	3470	28^0 31'	83^0 57'	3670
Humla (closed)	553			30^0 16'	81^0 14'	4220			
Humla		Panom-mukhi (Daldung Khola)		30^0 11'	81^0 32'	3811	30^0 11'	81^0 32'	3500
Kanjirowa	725	Sano Bheri		29^0 07'	82^0 36'	2735	29^0 07'	82^0 36'	2600

Source: International Centre for Intrigated Mountain Development, Inventory of Glaciers, Glacial Lakes and Glacial Lake Outbrust Flood Nepal 2001.Department of Hydrology and Meteorology (Year Book, 1997, Supplement No. VII, 2000.)

Table 6.10 : Famous Glacial Lakes in Himalaya

Description	Lower Barun	Imja	Tsho Rolpa	Thulagi	Dig Thso	Tam Pokhari
Latitude	27° 48' N	27° 59' N	27° 50' N	28 ° 30' N	27° 52' N	27° 44' N
Longitude	87 ° 07' E	86 ° 56' E	86 ° 28' E	84 ° 30' E	86 ° 35' E	86 ° 15' E
Altitude (m)	4570	5000	4580	4146	4365	4432
Depth (m)						
Average	50	47	55.1	41.8	20	45
Maximum	118	99	131	81		
Length (km)	1.25	1.3	3.2	2	1.21	1.15
Width (km)	0.6	0.5	0.5	0.45	0.44	0.5
Area (sq. km)	0.78	0.6	1.39	0.76	0.5	0.47
Average water ($10^6 xm^3$)	28	28	76.6	31.8	10	21.25
Approximate age (year)	35	45	45	45	50	45

Source: International Center for Integrated Mountain Development (Himalayan Wetlands- Risks, Challenges and Opportunities edited by Bishnu B.Bhandari (2007) and Gea Jae Joo based on Inventory of Glaciers, Glacial Lakes and Glacial Lake Outburst Flood (Nepal) – Pradip K. Mool, Samjwal R. Bajracharya and Sharad Joshi - 2000).

Table 6.11 : Glaciers, Glacial Lakes and Major River Basins

Basins	Glaciers		Glacial Lakes	
	Number	Area (sq. km)	Number	Area (sq. km)
Koshi	845	1,103	599	26.0
Gandaki	1,340	1,665	116	9.538
Karnali	1,459	1,023	742	29.147
Mahakali	164	112.5	9	0.137
Total	**3,808**	**3,902**	**1,466**	**64.78**

Sources of glacier:Glacier Status in Nepal and decadal change from 1980 to 2010 based on landsat data : ICIMOD
Sources of glacial lake: ICIMOD (2011) Glacial lakes and glacial lake outburst floods in Nepal. Kathmandu: ICIMOD

Table 6.12 : Water Quality of Different Water Sources in the Kathmandu Valley, 2005

Parameters	Unit	Water sources				WHO GV
		PW	PUTW	Well	SS	
pH	metre	6.5-8.2	6.5-7.5	7.5	7.5	6.5-8.5
Temp	^0C	13-18	12--15	15-18	15-18	25.0
Iron	mg/l	ND-0.2	0.2	0.2	0.3	0.3-3.0
Chlorine (mg/l)	mg/l	ND	ND	ND	ND	0.2
Chloride (mg/l)	mg/l	10--30	22-45	26-27	23-45	250
N-NH4 (mg/l)	mg/l	ND-0.2	0.2	0.2	0.2	0.04-0.4
PO4 - P (mg/l)	mg/l	0.1	0.1	0.1	0.1	0.4-5.5
Coliform bacteria	Source points	+/-	+	+	+	-
Coliform bacteria	Consumption point	+				-
E. coli	cfu/100 ml	10-130	3--20	48-200	58	0

Note: PTW = private tap water, PUTW = public tap water, SS = stone spout, WHO GV = World Health Organization guideline value.

Source: Pradhan et al. 2005.

Table 6.13 : Water Quality of Major Rivers During Dry Season, 1998

Development Region	Location / River	pH	TDS (mg/l)	DO (mg/l)	B0D (mg/l)
Eastern	Mechi	8.3	30	8.9	1.8
	Kankai	7.7	60	8.7	2
	Arun	6.5	200	9.1	2.1
Central	East Rapti at Sauraha	7.8	213	8.7	2.5
Western	Seti at Ramghat	8.2	222	9.3	2
Mid- Western	Bheri at Chatagaon	7.8	208	9.3	1.1
Far -Western	Karnali at Chisapani	8.9	264	10.5	1.5
	Mahakali at Pancheswor	8.8	110	5	2
	WHO Guideline	**6.5-8.5**	**100**	**>5.0**	**3**

Source: Department of Hydrology and Meteorology,1998 (CBS :A Compendium on Environment Statistics, Nepal, 1998.)

Table 6.14 : Nepal's Drinking Water Quality Standards

Group	Parameter	Unit	Maximum Concentration Limits
Physical	Turbidity	NTU	5 (10)**
	pH		6.5-8.5*
	Color	TCU	5 (15)**
	Taste & Odor		Would not be objectionable
	Total Dissolved Solids	mg/l	1000
	Electrical Conductivity	µc/cm	1500
	Iron	mg/l	0.3 (3)**
	Manganese	mg/l	0.2
	Arsenic	mg/l	0.05
	Cadmium	mg/l	0.003
	Chromium	mg/l	0.05
	Cyanide	mg/l	0.07
	Fluoride	mg/l	0.5-1.5*
	Lead	mg/l	0.01
	Ammonia	mg/l	1.5
Chemical	Chloride	mg/l	250
	Sulphate	mg/l	250
	Nitrate	mg/l	50
	Copper	mg/l	1
	Total Hardness	mg/l	500
	Calcium	mg/l	200
	Zinc	mg/l	3
	Mercury	mg/l	0.001
	Aluminum	mg/l	0.2
	Residual Chlorine	mg/l	0.1-0.2*
Micro Germs	E-Coli	MPN/100ml	0
	Total Coli form	MPN/100ml	95 % in sample

*Note : * These standards indicate the maximum and minimum limits.*

*** Figures in parenthesis are upper range of the standards recommended.*

Source : Nepal Gazette (26 June 2006).

Table 6.15 : Tolerance Limits for Different Industrial Effluents Discharged into Inland Surface Water

S.N.	Characteristics	Land Surface Water	Public Sewerage	Inland Surface Water
1	Total Suspended solids, mg/l, Max	30-200	600	50
2	Particle size of total suspended particles	Shall pass 850-micron sieve		Shall pass 850-micron sieve
3	pH value	5.5-9.0	5.5-9.0	5.5-9.0
4	Temperature, ^{0}C , Max	Shall not exceed 40 degree C in any section of the stream within 15 meters downstream from the effluent outlet.	45	Shall not exceed 40 degree C in any section of the stream within 15 meters downstream from the effluent outlet.
5	Total Chromium, mg/l, Max	-	2	
6	Sulphates (SO_4), mg/l, Max		500	
7	Total Dissolved Solids, mg/l, Max	-	2100	
8	Biochemical oxygen demand (BOD) for 5 days at 20 degree C, mg/l, Max	50	400	50
9	Oils and grease, mg/l, max	10	50	10
10	Phenolic compounds, mg/l, max	1	10	1
11	Cynides (as CN), mg/l, max	0.2	2	0.2
12	Sulphides (as S), mg/l, max	2	2	2
13	Radioactive materials			
	a. Alpha emitters, c/ml, max	10^{-7}		10^{-7}
	b. Beta emitters, c/ml, max	10^{-8}		10^{-8}
14	Insecticides	absent	absent	absent
15	Total residual chlorine, mg/l	1		1
16	Fluorides (as F), mg/l, max	2	10	2
17	Arsenic (as AS), mg/l, max	0.2	1	0.2
18	Cadmium (as Cd), mg/l, max	2	2	2
19	Hexavalent chromium (as Cr,) mg/l max	0.1		0.1
20	Copper (as Cu), mg/l, max	3	3	3
21	Lead (as pb), mg/l, max	0.1	0.1	0.1
22	Nickel (as Ni), mg/l, max	3	3	3
23	Selenium (as Se), mg/l, max	0.05	0.05	0.05
24	Zinc (as Zn), mg/l, max	5	5	5
25	TDS, mg/l, max			
26	Chloride (CI), Mg/l, max			
27	Soleplate (SO_4), mg/l, max			
28	Mercury (as Hg) mg/l, max	0.01	0.01	0.01
29	Mineral oils, mg/l, max		10	
30	Inhibition of nitrification test at 2000 ml/l		<50%	
31	Sodium, % max			
32	Ammonical nitrogen, mg/l, max	50	50	50
33	Chemical Oxygen Demand, mg/l, max	250	1000	250
34	Silver, mg/l, max	0.1	0.1	0.1

Source:: Nepal Gazette , 30 April 2001 and 23 June 2003

Table 6.16 : Generic Standard /Tolerance Limits for Different Industrial Effluents Discharged into Inland Surface Water

S.N.	Characteristics	Environmental Standard and Norms										
		Tanning Industry	Wool Processing Industry	Fermentat Industry	Vegetable Ghee & Oil Industry	Paper & Pulp Industry	Dairy Industry	Sugar Industry	Cotton and Textile Industry	Soap Industry	Brick kiln Industry	
											Suspended Particulate Matter (Max. Limit)	Heights of Chimney (Max. Limit)
1	TSS mg/l	100	100	100		100	150	100	100	200		
2	Particle Size of TSS											
3	pH value	5.5-9.0	5.5-9	5.5-9	5.5-9.0	5.5-9	5.5-8.5	5.5-9	6.0-9.0	5.5-9.0		
4	Temperature ^{0}C		40									
5	TDS, mg/l, max	2100										
6	Color and Odor	Absent										
7	BOD for 5 days at 200 degree C, mg/l, max	100	100	60	100	100	100	100	100	100		
8	Oils and grease, mg/l, max		10		10		10			10		
9	Cyanides (as CN), mg/l, max		5 (as C6 h5 OH)	101								
10	Sulphides (as S), mg/l, max	2	2									
11	Radioactive materials;			5.5-10								
12	Total residual Chlorine, mg/l			61								
13	Nickel (as Ni), mg/l, max				3							
14	Chlorides (as CI), mg/l, max	600										
15	Sodium, % max	60										
16	Chemical oxygen demand mg/l, Max	250	250		250		250	250	250	250		
17	Total chromium (as Cr) mg/l, max	2	2									
18	Bull's Trench Kiln, Forced Draught (Fixed Chimney)										600mg/Nm^3	17 Meter
19	Bull's Trench Kiln, Natural Draught (Fixed Chimney)										700mg/Nm^3	30 Meter
20	Vertical Shaft Brick Kiln (VSBK)										400mg/Nm^3	15 Meter
21	Hexavalent chromium (as Cr) mg/l, Max	0.1										
22	Phenolic compounds (as C_6 h_5 OH), mg/l		5							1		
23	Temperature ^{0} C		40									

Source: Nepal Gazette ,30 April 2001 and 23 June 2003

Table 6.17 : Nepal Water Quality Guidelines for Irrigation Water

S.N.	Parameter name	Target Water Quality Range	Remarks
Microbiological constituents:			
1	Coliforms(faecal)	< 1 count /100 ml	1 – 1000 count / 100 ml could be used for plants for which edible parts are not wetted.
Physical Constituents:			
1	pH	6.5 – 8.5	Adverse effect on plants outside this range
2	Suspended Solids	< 50 mg/l	Above the limit problem with sedimentation and irrigation system
3	Electrical Conductivity	< 40 mS/m	Upto 540 mS/m depending upon sensitivity of crops.
Chemical Constituents:			
1	Aluminium	< 5 mg/l	Upto 20 mg/l max. acceptable conc.
2	Arsenic	< 0.1 mg/l	> 2 mg/l creates severe problem
3	Beryllium	< 0.1 mg/l	0.1 – 0.5 mg/l max. acceptable conc.
4	Boron	< 0.5 mg/l	Upto 15 mg/l depending upon species.
5	Cadmium	< 0.01 mg/l	0.01 – 0.05 mg/l max. acceptable conc.
6	Chloride	< 100 mg/l	Upto 700 mg/l depending upon species
7	Chromium	< 0.1 mg/l	Upto 1.0 mg/l max. acceptable conc.
8	Cobalt	< 0.05 mg/l	Upto 5.0 mg/l max. acceptable conc.
9	Copper	< 0.2 mg/l	Upto 5.0 mg/l max. acceptable conc.
10	Fluoride	< 2.0 mg/l	Upto 15 mg/l max. acceptable conc.
11	Iron	< 5.0 mg/l (non-toxic)	> 1.5 mg/l creates problem in drip irrigation system
12	Lead	< 0.2 mg/l	Upto 2.0 mg/l max. acceptable conc.
13	Lithium	< 2.5 mg/l	For citrus < 0.75 mg/l
14	Manganese	< 0.02 mg/l	Upto 10 mg/l max. acceptable conc.
15	Molybdenum	< 0.01 mg/l	Upto 0.05 mg/l max. acceptable conc.
16	Nickel	< 0.2 mg/l	Upto 2.0 mg/l max. acceptable conc.
17	Nitrogen (inorganic)	< 5 mg/l	Higher concentration may affect sensitive plants and may contaminate ground water
18	Selenium	< 0.02 mg/l	Upto 0.05 mg/l max. acceptable conc.
19	Sodium Adsorption Ratio (SAR)	< 2.0	Upto 10 depending upon sensitivity of crops.
20	Sodium	< 70 mg/l	Upto 460 depending upon sensitivity of crops
21	Total Dissolved Solids (as EC)	< 40 mS/m	Upto 540 mS/m depending upon sensitivity of crops
22	Uranium	< 0.01 mg/l	Upto 0.1 mg/l max. acceptable conc.
23	Vanadium	< 0.1 mg/l	Upto 1.0 mg/l max. acceptable conc.
24	Zinc	< 1.0 mg/l	Upto 5 mg/l max. acceptable conc.

Source: Department of Irrigation, Ground Water Project (Neapl Gazette (Number 10.16 June 2008))

Table 6.18 : Nepal Water Quality Guidelines for Aquaculture

S.N.	Constituents	Target Water Quality Range		Remarks
1	Algae	No criteria		
2	Alkalinity	20 – 100 mg/l as $CaCO_3$		High alkalinity reduces natural food production in ponds below optimal production
3	Aluminium	< 30µg/L (pH >6.5),		Highly toxic to trouts (1.5 µg/l is fatal to brown trout)
		< 10 µg/L (pH < 6.5)		
4	Ammonia (for cold water fish)	0 – 25 µg/L		
5	Ammonia (for warm water fish)	0 – 30 µg/L		
6	Arsenic	0 – 0.05 mg/l		
7	Bacteria (E. Coli)	< 10 counts of E.coli /g of fish flesh		
8	BOD_5	< 15 mg/l		
9	Cadmium	Hardness: 0–60 mg/l	< 0.2 mg/l	Cadmium toxicity depends upon hardness of water
		Hardness: 60–120 mg/l	< 0.8 mg/l	
		Hardness: 120–180mg/l	< 1.3 mg/l	
		Hardness: >180 mg/l	< 1.8 mg/l	
10	Carbon dioxide	< 12 mg/l, upto 75 mg/l for warm water fish		
11	Chloride	Value not recommended (fish can survive at < 600 mg/l Chloride but the production is not optimum)		
12	Chlorine	< 2 µg HOCl /L for cold water fish		
		< 10 µg HOCl/L for warm water fish		
13	Chromium (VI)	< 20 µg/L		
14	COD	< 40 mg/l		
15	Colour	< 100 Pt-Co unit		
16	Copper	< 5 µg/L		0.006 and 0.03 µg/L are upper limits for hard and soft water
17	Cyanides	< 20 µg/L as HCN		LC_{50} starts from 100 µg/L upwards
18	Dissolved oxygen	6 – 9 mg/l for cold water species		
		5 – 8 for intermediate water species,		
		5 – 8 for warm water species.		
19	Fluoride	< 20 µg/l		
20	Iron	< 10 µg/l		0.2 - 1.75 general lethal threshold for fish
21	Lead	< 10 µg/l		30 µg/L max. conc. limit for brook trout
22	Magnesium	< 15 mg/l		
23	Manganese	< 100 µg/l		Above 500 µg/L increasing risk of lethal effect
24	Mercury	< 1 µg/l		Bioaccumulation and biomagnification occurs
25	Nickel	< 100 µg/l		
26	Nitrate-N	< 300 mg/l		1000 mg/l is below the 96-hour LC_{50} values for most fish
27	Nitrite-N	0 – 0.05 mg/l for cold water fish		> 7 mg/l is LC_{50} for many fish species
		0.06 - .25 mg/l for warm water fish		

Table 6.18 : Nepal Water Quality Guidelines for Aquaculture

(contd...)

S.N.	Constituents	Target Water Quality Range		Remarks	
28	Nuisance plants	Less than 10 % of the fish pond should be covered by aquatic plants.			
29	Oils and Greese (including Petrochemicals)	< 300 µg/L			
30	PCBs	No quantitative guidelines, should not be detected in fish			
31	pH	6.5 – 9.0		Outside this range the health of fish is adversely affected	
32	Phenols	< 1 mg/l		> 7.5 mg/l 24 hr. LC_{50} starts for most fish	
33	Phosphorus	< 0.6 mg/l as orthophosphate		> 12.5 mg/l 96 hr. LC_{50} starts for most fish	
34	Selenium (VI)	< 0.3 mg/l			
35	Sulphide as H_2S	< 0.001 mg/l		> 0.002 mg/l long term health hazard for fish	
36	Temperature	4 – 18 for cold water fish		Mortality increases with increasing TGP	
		16 – 32 for intermediate species			
		24 – 30 for warm water fish			
37	Total Dissolved Gases as Total Gas Pressure (TGP)	< 100 % for cold water fish			
		< 105 % for warm water fish			
38	Total Dissolved Solids	< 2000 mg/l			
39	Total Hardness as $CaCO_3$	20 – 100 mg/l ,		In > 175 mg/l osmoregulation of fish is affected.	
40	Total Suspended Matter.	< 20000 mg/l for turbid water species,			
		< 25 NTU for clear water species			
41	Zinc, depends upon water hardness: mg/l dissolved Zn	Hardness:	Coldwater	Warm water	
		10 mg/l	0.03	0.3	Warm water fish are more tolerant
		50 mg/l	0.2	0.7	
		100 mg/l	0.3	1	
		500 mg/l	0.5	2	

Pesticides: No guideline values provided.

Source : Department of Irrigation, Ground Water Projcet (Nepal Gazette (Number 10, 16 June 2008).

Table 6.19 : Nepal Water Quality Guidelines for Livestock Watering

S.N.	Constituent	Proposed concentration
1	Algae	No visible blue-green scum
2	Aluminium	< 5 mg/l
3	Arsenic	< 0.2 mg/l
4	Beryllium	< 0.1 mg/l
5	Boron	< 5 mg/l
6	Cadmium	< 0.01 mg/l
7	Calcium	< 1000 mg/l
8	Chloride	
9	Chromium (VI)	< 1 mg/l
10	Cobalt	< 1 mg/l
11	Copper	< 0.5 mg/l
12	Electrical Conductivity	< 1.5 dS/m
13	Fluoride	< 2 mg/l
14	pH	6.5 – 8.5
15	Iron	Not Toxic
16	Lead	< 0.1 mg/l
17	Magnesium	< 500 mg/l
18	Manganese	< 10 mg/l
19	Mercury	< 10 µg/L
20	Molybdenum	< 0.01 mg/l
21	Nickel	< 1 mg/l
22	Nitrate/Nitrite	< 100 mg/l as nitrate
23	Nitrite – N	< 10 mg/l
24	Selenium	< 0.05 mg/l
25	Sodium	< 2000 mg/l
26	Sulphate	< 1000 mg/l
27	Total Dissolved Solids	
	Dairy Cattle	< 7100 mg/l
	Sheep	<12800 mg/l
	Horse	< 6400 mg/l
	Pigs	< 4300 mg/l
	Poultry	< 2800 mg/l
28	Vanadium	< 0.1 mg/l (FAO)
29	Zinc	< 24 mg/l (FAO)
Pathogens		
1	Faecal coliform count	< 200 count /100ml
		< 1000 counts for < 20 % of the samples
Pesticides: Guidelines applicable for human beings.		
Chlorinated Hydrocarbons: Guidelines for human beings apply.		

Source : Department of Irrigation, Ground Water Project (Nepal Gazette (Number 10, 16 June 2008).

Table 6.20 : Nepal Water Quality Guidelines for Recreation

S.N.	Parameter Name:	Full contact	Partial contact	Non contact
Biological Parameters:				
1	Algae, macrophytes, phytoplankton scum, etc.	Should not be present in excessive amount		
Indicator Organism				
	Total coliform Bacteria			
	Faecal coliform	<130 count/100 ml	<1000 count/100ml	No target value
	Escherichia coli	<130 count/100 ml	No target value	No target value
	Entero cocci			
	Faecal Streptococci	<30 count/100 ml	0 – 230 count/100 ml	No target value
	Coliphage	< 20 count/100 ml	No target value	No target value
	Schistosoma/ Bilharzia	No snails capable of acting as the intermediate host of the bilharzia parasite	No snails capable of acting as the intermediate host of the bilharzia parasite	No target value
Nuisance plants				
		Swimmer should not be entangled	Boats should not be entangled.	
Chemical Irritant				
The criteria are qualitative and no specific irritant and quantitative measures are given				
Chemical Parameters:				
	pH	6.5 – 8.5	6.5 – 8.5	No target value
Physical Parameters:				
1	Clarity	> 1.6 (Sechchi disc depth Metres)	No target value	No target value
2	Colour	100 Pt-Co units	100 Pt-Co units	No Target value
3	Floating Matter and refuse	Free of floating or submerged debris	No target value	No target value
4	Odour	No objectionable or unpleasant odour	No objectionable or unpleasant odour	No objectionable or unpleasant odour
5	Residual Chlorine	0.1 mg/l	No target value	No target value
6	Surface films	Should not be noticeable	Should not be noticeable	Should not be noticeable
7	Turbidity	0.5 NTU		

Source : Department of Irrigation, Ground Water Project (Nepal Gazette (Number 10, 16 June 2008).

Table 6.21 : Nepal Water Quality Guidelines for Industries

S. N.	Parameter Name:	Recommended value			
		Category 1	Category 2	Category 3	Category 4
1	Alkalinity	<50 mg/l	< 120 mg/l	< 300 mg/l	< 1200 mg/l
2	COD	< 10 mg/l	< 15 mg/l	< 30 mg/l	< 75 mg/l
3	Chloride	< 20 mg/l	< 40 mg/l	< 100 mg/l	< 500 mg/l
4	Iron	< 0.1 mg/l	< 0.2 mg/l	< 0.3 mg/l	< 10 mg/l
5	Manganese	< 0.05 mg/l	< 0.1 mg/l	< 0.2 mg/l	< 10 mg/l
6	pH	7.0 - 8.0	6.5 - 8.0	6.5 - 8.0	10-May
7	Silica	< 5 mg/l	0 - 10 mg/l	< 20 mg/l	< 150 mg/l
8	Sulphate	< 30 mg/l	< 80 mg/l	< 200 mg/l	< 500 mg/l
9	Suspended solids	< 3 mg/l	< 5 mg/l	< 5 mg/l	< 25 mg/l
10	Total dissolved solids	TDS: < 100 mg/l	TDS: < 200	TDS: < 450	TDS: < 1600
		EC: < 15 mS/m	EC: < 30	EC: < 70	EC: < 250
11	Total Hardness	< 50 mg/l as $CaCO_3$	< 100 mg/l as $CaCO_3$	< 250 mg/l as $CaCO_3$	< 1000 mg/l as $CaCO_3$

Source : Department of Irrigation, Ground Water Project (Nepal Gazette (Number 10, 16 June 2008).

Table 6.22 : Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem

S.N.	Parameter name		Target Water Quality Range	Chronic Effect Value	Acute Effect Value
1	Aluminium (mg/l)		At pH <6.5: 5	10	100
			At pH >6.5:10	20	150
2	Ammonia (µg/L)		< 7	< 15	< 100
3	Arsenic (µg/L)		< 10	< 20	< 130
4	Atrazine (µg/L)		< 10	< 19	< 100
5	Cadmium				
	Soft water	(60 mg/l $CaCO_3$)	< 0.15	0.3	3
	Medium water	(60 – 119 mg/l)	< 0.25	0.5	6
	Hard water	120 – 180 mg/l	< 0.35	0.7	10
	Very Hard	> 180 mg/l	< 0.40	0.8	13
6	Chlorine (Residual) µg/L		< 0.2	0.35	5
7	Chromium (VI) µg/L		7	10	200
8	Chromium (III) µg/L		< 12	24	340
9	Copper µg/L				
	Soft water	(60 mg/l $CaCO_3$)	< 0.3	0.53	1.6
	Medium water	(60 – 119 mg/l)	< 0.8	1.5	4.6
	Hard water	120 – 180 mg/l	< 1.2	2.4	7.5
	Very Hard	> 180 mg/l	< 1.40	2.8	12
10	Cyanide µg/L		1	4	110
11	Dissolved Oxygen (% saturation)		80 – 120	> 60	> 40

Table 6.22 : Nepal Water Quality Guidelines for the Protection of Aquatic Ecosystem

(contd...)

S.N.	Parameter name		Target Water Quality Range	Chronic Effect Value	Acute Effect Value
12	Endosulphan (µg/L)		< 0.01	0.02	0.2
13	Fluoride (µg/L)		< 750	1500	2540
14	Iron		The iron concentration should not be allowed to vary by more than 10 % of the background dissolved iron concentration for a particular site or case, at a specific time.		
15	Lead µg/L				
	Soft water	(60 mg/l $CaCO_3$)	< 0.2	0.5	4
	Medium water	(60 – 119 mg/l)	< 0.5	1	7
	Hard water	120 – 180 mg/l	< 1.0	2	13
	Very Hard	> 180 mg/l	< 1.2	2.4	16
16	Manganese (µg/L)		< 180	370	1300
17	Mercury (µg/L)		< 0.04	0.08	1.7
18	Nitrogen (inorganic)		Inorganic nitrogen concentrations should not be changed by more than 15 % from that of the water body under local unimpacted conditions at any time of the year;		
			The trophic status of the water body should not increase above its present level, though a decrease in trophic status is permissible (see Effects);		
			The amplitude and frequency of natural cycles in inorganic nitrogen concentrations should not be changed.		
19	pH				
	All aquatic ecosystems		pH values should not be allowed to vary from the range of the background pH values for a specific site and time of day, by > 0.5 of a pH unit, orby > 5 %, and should be assessed by whichever estimate is more conservative.		
20	Phenols (µg/l)		<30	60	500
21	Phosphorus (inorganic) All surface waters		Inorganic phosphorus concentrations should not be changed by > 15 % from that of the water body under local, unimpacted conditions at any time of the year;		
			The trophic status of the water body should not increase above its present level, though a *decrease* in trophic status is permissible (see *Effects*);		
			The amplitude and frequency of natural cycles in inorganic phosphorus concentrations should not be changed.		
22	Selenium (µg/l)		< 2	5	30
23	Temperature (All aquatic ecosystems)		Water temperature should not be allowed to vary from the background average daily water temperature considered to be normal for that specific site and time of day, by > 2 ^{o}C, or by > 10 %, whichever estimate is the more conservative.		
24	Total Dissolved Solids (All inland waters)		• TDS concentrations should not be changed by > 15 % from the normal cycles of the water body under un impacted conditions at any time of the year;		
			• The amplitude and frequency of natural cycles in TDS concentrations should not be changed.		
25	Total Suspended Solids (All inland waters)		Any increase in TSS concentrations must be limited to < 10 % of the background TSS concentrations at a specific site and time.		
26	Zinc (µg/l)		< 2	3.6	36

Source : Department of Irrigation, Ground Water Project (Nepal Gazette (Number 10, 16 June 2008).

Table 6.23 : Number of Lakes in Districts by various heights in Nepal, 2009

S.N.	District	Total Lake	<100m	100-499 m	500- 1999m	2000-2999m	3000-4999	≥5000m
1	Taplejung	**380**	0	0	0	2	297	81
2	Panchthar	**17**	0	0	2	8	7	0
3	Ilam	**30**	0	14	14	1	1	0
4	Jhapa	**136**	58	78	0	0	0	0
5	Morang	**184**	123	60	1	0	0	0
6	Sunsari	**69**	41	28	0	0	0	0
7	Dhankuta	**4**	0	0	4	0	0	0
8	Terathum	**4**	0	0	2	2	0	0
9	Sankhuwasabha	**159**	0	0	3	4	109	43
10	Bhojpur	**7**	0	0	5	1	1	0
11	Solukhumbu	**339**	0	0	1	1	113	224
12	Okhalandhunga	**0**	0	0	0	0	0	0
13	Khotang	**10**	0	0	4	5	1	0
14	Udaypur	**14**	4	4	6	0	0	0
15	Saptari	**46**	35	11	0	0	0	0
16	Siraha	**140**	67	73	0	0	0	0
17	Dhanusha	**230**	193	37	0	0	0	0
18	Mahottari	**186**	173	13	0	0	0	0
19	Sarlahi	**74**	47	27	0	0	0	0
20	Sindhuli	**9**	0	4	5	0	0	0
21	Ramechhap	**25**	0	0	1	0	21	3
22	Dolakha	**42**	0	0	3	5	23	11
23	Sindhupalchwok	**75**	0	0	12	5	58	0
24	Kabhrepalanchok	**1**	0	0	1	0	0	0
25	Lalitpur	**3**	0	0	3	0	0	0
26	Bhaktapur	**2**	0	0	2	0	0	0
27	Kathmandu	**1**	0	0	1	0	0	0
28	Nuwakot	**3**	0	0	0	1	2	0
29	Rasuwa	**38**	0	0	0	0	34	4
30	Dhading	**5**	0	0	0	0	5	0
31	Makawanpur	**2**	0	0	1	1	0	0
32	Rautahat	**85**	68	17	0	0	0	0
33	Bara	**93**	75	18	0	0	0	0
34	Parsa	**71**	63	8	0	0	0	0
35	Chitwan	**40**	0	40	0	0	0	0
36	Gorkha	**36**	0	1	5	3	26	1
37	Lamjung	**23**	0	0	5	4	14	0
38	Tanahun	**2**	0	1	1	0	0	0
39	Syangja	**4**	0	0	1	3	0	0
40	Kaski	**29**	0	0	22	0	7	0
41	Manang	**66**	0	0	0	0	26	40
42	Mustang	**78**	0	0	0	2	5	71
43	Myagdi	**33**	0	0	5	14	13	1
44	Parbat	**5**	0	0	5	0	0	0
45	Baglung	**60**	0	0	15	37	8	0
46	Gulmi	**11**	0	0	7	4	0	0
47	Palpa	**12**	0	0	12	0	0	0
48	Nawalparasi	**163**	0	163	0	0	0	0
49	Rupandehi	**289**	131	158	0	0	0	0
50	Kapilvastu	**351**	190	161	0	0	0	0

Table 6.23 : Number of Lakes and Districts by various heights in Nepal, 2009

(contd...)

S.N.	District	Total Lake	<100m	100-499 m	500- 1999m	2000-2999m	3000-4999	≥ 5000m
51	Argakhachi	**3**	0	0	3	0	0	0
52	Pyuthan	**19**	0	0	13	6	0	0
53	Rolpa	**16**	0	0	11	1	4	0
54	Rukum	**70**	0	0	13	14	31	12
55	Salyan	**5**	0	0	5	0	0	0
56	Dang	**38**	0	8	30	0	0	0
57	Banke	**243**	0	243	0	0	0	0
58	Bardia	**82**	0	82	0	0	0	0
59	Surkhet	**22**	0	1	21	0	0	0
60	Dailekh	**7**	0	0	5	2	0	0
61	Jajarkot	**16**	0	0	0	0	16	0
62	Dolpa	**210**	0	0	0	0	47	163
63	Jumla	**99**	0	0	0	1	97	1
64	Kalikot	**1**	0	0	0	0	1	0
65	Mugu	**125**	0	0	0	3	93	29
66	Humla	**381**	0	0	0	0	147	234
67	Bajura	**57**	0	0	0	5	45	7
68	Bajhang	**25**	0	0	0	2	19	4
69	Achham	**13**	0	0	3	7	3	0
70	Doti	**19**	0	0	9	4	6	0
71	Kailali	**114**	0	113	1	0	0	0
72	Kanchanpur	**85**	2	79	4	0	0	0
73	Dadheldhura	**2**	0	0	2	0	0	0
74	Baitadi	**1**	0	0	1	0	0	0
75	Darchula	**19**	0	0	1	0	16	2
Total		**5358**	**1270**	**1442**	**271**	**148**	**1296**	**931**

Source : National Lake Conservation Development Committee(National Lake Strategic plan,2010 March)

Table 6.24 : Potentially Dangerous Glacial Lakes in Nepal

S.N.	Glacier Lake	Location /District	Altitude (m.)	Area (sq.m.)
1	Lower Barun	Sankhuwasabha	4550	NA
2	Lumding Tsho	Solukhumbu	4846	104943
3	Dig Tsho		4364	143249
4	Imja Tsho		5023	48811
5	Tam Pokhari		4431	138846
6	Dudh Pokhari		4760	274296
7	Unnamed 1		5266	133752
8	Unnamed 2		5056	112398
9	Hungu		5181	198905
10	East Hungu 1		5379	78760
11	East Hungu 2		5483	211877
12	Unnamed 3		5205	349396
13	West Chamjang		4983	6446
14	Tsho Rolpa	Dolakha	4556	231693
15	Unnamed 4	Taplejung	4876	179820
16	Nagma Pokhari		4907	18971
17	Unnamed 5	Gorkha	3590	81520
18	Unnamed 6	Mustang	5419	149544
19	Unnamed 7		5452	1015173
20	Thulagi		3825	223385

NA : Not Available

Source : Ministry of Environment,(NAPA to Climate Change, 2010 September)

Chapter VII

Other Natural Resources

Table 7.1 : Numbers of Threatened Species by Major Groups of Organisms on the Red List, 1996- 2013

S.N.	Major Group of Species	Estimated Number of described species	Number of species evaluated by 2013	Number of threatened species													Species evaluted in 2013,as % of species described
				1996/98	2000	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	
Vertebrates																	
1	Mammals	5,506	5,506	1,096	1,130	1,137	1,130	1,101	1,093	1,094	1,141	1,142	1,131	1,138	1,139	1,143	100%
2	Birds	10,065	10,065	1,107	1,183	1,192	1,194	1,213	1,206	1,217	1,222	1,223	1,240	1,253	1,313	1,308	100%
3	Reptiles	9,831	4204	253	296	293	293	304	341	422	423	469	594	772	807	879	43%
4	Amphibians	7,044	6,409	124	146	157	157	1,770	1,811	1,808	1,905	1,895	1,898	1,917	1,933	1,950	91%
5	Fishes	32,700	11,172	734	752	742	750	800	1171	1201	1275	1414	1851	2028	2058	2110	34%
Sub total		**65,146**	**37,356**	**3,314**	**3,507**	**3,521**	**3,524**	**5,188**	**5,622**	**5,742**	**5,966**	**6,143**	**6,714**	**7,108**	**7,250**	**7,390**	**57%**
Invertebrates																	
6	Insects	1,000,000	4610	537	555	557	553	559	623	623	626	711	733	741	829	896	0.5%
7	Molluscs	85,000	6,809	920	938	939	967	974	975	978	978	1036	1288	1673	1857	1898	8%
8	Crustaceans	47,000	3163	407	408	409	409	429	459	460	606	606	596	596	596	723	7%
9	Corals	2,175	856	1	1	1	1	1	1	4	235	235	235	235	236	235	39%
10	Arachnids	102,248	35	11	11	11	11	11	11	11	18	18	19	19	20	21	0.03%
11	Velvet Worms	165	11	6	6	6	9	9	9	9	9	9	9	9	9	9	7%
12	Horseshoe Crabs	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	100%
13	Others	68,658	423	9	9	9	9	9	24	24	24	24	24	24	23	40	0.62%
Sub total		**1,305,250**	**15,911**	**1,891**	**1,928**	**1,932**	**1,959**	**1,992**	**2,102**	**2,109**	**2,496**	**2,639**	**2,904**	**3,297**	**3,570**	**3,822**	**1%**
Plants																	
14	Mosses	16,236	102	---	80	80	80	80	80	80	82	82	80	80	76	76	0.6%
15	Ferns and Allies	12,000	342	---	---	---	111	140	139	139	139	139	148	163	167	187	3%
16	Gymnosperms	1052	1010	142	141	142	304	305	306	321	323	322	371	377	374	399	96%
17	Flowiering Plants	268,000	16,766	5,186	5,390	5,492	6,279	7,796	7,865	7,899	7,904	7,948	8,116	8,527	8,764	9,394	6%
18	Green Algae	4,242	13	---	---	---	---	---	---	0	0	0	0	0	0	0	0.3%
19	Red Algae	6,144	58	---	---	---	---	---	---	9	9	9	9	9	9	9	0.9%
Sub total		**307,674**	**18,291**	**5,328**	**5,611**	**5,714**	**6,774**	**8,321**	**8,390**	**8,448**	**8,457**	**8,500**	**8,724**	**9,156**	**9,390**	**10,065**	**6%**
Fungi and Protists																	
20	Lichens	17,000	2	---	---	---	2	2	2	2	2	2	2	2	2	2	0.01%
21	Mushrooms	31,496	1	---	---	---	---	---	1	1	1	1	1	1	1	1	0.003%
22	Brown Algae	3,127	15	---	---	---	---	---	---	6	6	6	6	6	6	6	0.50%
Sub total		**51,623**	**18**	---	---	---	**2**	**2**	**3**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**0.03%**
Total		**1,729,693**	**71,576**	**10,533**	**11,046**	**11,167**	**12,259**	**15,503**	**16,117**	**16,308**	**16,928**	**17,291**	**18,351**	**19,570**	**20,219**	**21,286**	**4%**

Source :IUCN Red List version 2013

Table 7.2: Change in numbers of species in the threatened categories for the major taxonomic groups on the Red list ,1996-2013

Group	1996/98	2000	2002	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013
Critically Endangered (CR)													
Mammals	169	180	181	184	162	162	163	188	188	188	194	196	196
Birds	168	182	182	182	179	181	189	190	192	190	189	197	198
Reptiles	41	56	55	57	64	73	79	86	93	106	137	144	164
Amphibians	18	25	30	30	413	442	441	475	484	486	498	509	520
Fishes	157	156	157	162	171	253	254	289	306	376	414	415	413
Insects	44	45	46	46	47	68	69	70	89	89	91	119	125
Molluscs	257	222	222	250	265	265	268	268	291	373	487	549	553
Plants	909	1014	1046	1276	1490	1541	1569	1575	1577	1619	1731	1821	1957
Endangered (EN)													
Mammals	315	340	339	337	352	348	349	448	449	450	447	446	447
Birds	235	321	326	331	345	351	356	361	362	372	382	389	397
Reptiles	59	74	79	78	79	101	139	134	150	200	284	296	329
Amphibians	31	38	37	37	729	738	737	755	754	758	764	767	783
Fishes	134	144	143	144	160	237	254	269	298	400	477	494	530
Insects	116	118	118	118	120	129	129	132	151	166	169	207	247
Molluscs	212	237	236	243	221	222	224	224	245	328	417	480	486
Plants	1197	1266	1291	1634	2239	2258	2278	2280	2316	2397	2564	2655	3009
Vulnerable (VU)													
Mammals	612	610	617	609	587	583	582	505	505	493	497	497	500
Birds	704	680	684	681	688	674	672	671	669	678	682	727	713
Reptiles	153	161	159	158	161	167	204	203	226	288	351	367	386
Amphibians	75	83	90	90	628	631	630	675	657	654	655	657	647
Fishes	443	452	442	444	470	681	693	717	810	1075	1137	1149	1167
Insects	377	392	393	389	392	426	425	424	471	478	481	503	524
Molluscs	451	479	481	474	488	488	486	486	500	587	769	828	859
Plants	3222	3331	3377	3864	4592	4591	4600	4602	4607	4708	4861	4914	5099

Source: IUCN Red List version 2013

Table 7.3 : Ecosystems and Protected Areas in Nepal

S.N.	Physiographic Zone	Protected Area		Ecosystems	
		Number	Coverage (sq.km.)	Total	Covered by the PA
1	High Himal	10	20293.9 (71)	43 (36.4)	32 (27.1)
2	High Mountains	2	3430.0 (12)		
3	Middle Mountains	1	285.8 (1)	52 (44.1)	33(28.0)
4	Siwaliks	4	2858.3(10)	13(11.)	5(4.2)
5	Terai	3	1715.0(6)	10 (8.5)	10(8.5)
Total		**20**	**28583.0(100)**	**118(100)**	**80(67.8)**

Source: Ministry of Forests and Soil Conservation, 2014 . Figures in the parentheses refer to percentages.

Table 7.4: Number of Plant and Animal Species in Nepal

S.N.	Group	No. of known species in the World	No. of known species in Nepal	Percentage of share in Nepal	Reference
A	**Flora**				
1	Angiosperms	22313	6973	3.2	UNEP - WCMC (2004)
2	Gymnosperms	133	26	5.1	Bista (2006)
3	Pteridophytes	10369	534	5.1	Kunwar et al. (2010)
4	Bryophytes	>14000	1150	8.2	
5	Lichens	>17000	771	4.5	
6	Fungi	>70000	2025	2.9	
7	Algae	>40000	1001	2.5	Prasad (2013)
	Flora Total		12480	3.3	
B	**Fauna**				
1	Mammals	4675	208	5.2	Jnyawali et al. (2011)
2	Birds	9799	867	9.5	BCN and DNPWC (2011)
3	Reptiles	7870	123	1.9	Schleich and Kastle (2002)
4	Amphibians	4780	118	2.5	ICIMOD and MOEST (2007)
5	Fishes	10000	230	1.9	Rajbansi (2013)
6	Molluscs		79	NA	Nesemann and Sharma (2005)
7	Moths	*160000*	3958	3.6	Haruta (2006)
8	Butterflies	17500	651	3.7	Bhuju et al. (2007)
9	Spiders	39490	175	0.4	
10	Rotifers		61	NA	Deams and Dumont (1974) ; Surana et al.(2005)
11	Crustaceans		59	NA	Swar (1979) ; Tiwari and chhetry (2009)
12	Other Insects		5052	0.7	Thapa (1997)
13	Platyhelminthes		168	1.4	Gupta (1997)
	Fauna Total		11706	1.1	

Table 7.5 : Number of Wildlife Species in Nepal

S.N.	Species	Year	Area/place	Number
1	Arna	2014	Koshi Tappu Wildlife Reserve	327
2	Blackbuck	2014	Krishnasar Conservation Area	300
3	Blue sheep	2007	Dhorpatan Hunting Reserve	852
4	Blue sheep	2009	Kanchenjungha Conservation Area	1686
5	Gaur	2011	Chitwan National Park	312
6	Gaur	2008	Parsa Wildlife Reserve	37
7	Gharial	2013	Babai River	14
8	Gharial	2013	Karnali River	2
9	Gharial	2011	Koshi River	0
10	Gharial	2013	Narayani River	63
11	Gharial	2013	Rapti River	45
12	Jharal	2009	Langtang National Park	284
13	Rhino	2011	Bardia National Park	24
14	Rhino	2011	Chitwan National Park	503
15	Rhino	2011	Suklaphanta Wildlife Reserve	7
16	Swamp deer	2014	Suklaphanta Wildlife Reserve	2301
	Swamp deer	2012	Bardia National Park	105
17	Snow leopard		8 Mountain Protected Areas	350-500
18	Tiger	2013	Bardia National Park	50
19	Tiger	2013	Chitwan National Park	120
20	Tiger	2013	Parsa Wildlife Reserve	7
21	Tiger	2013	Suklaphanta Wildlife Reserve	17

Source : Department of National Park and Wildlife Conservation

Table 7.6 : Number of Cultivated and Wild Food Plant Species

Groups	Food Plant Species			Cultivated Plants (%)	Wild Food Plant(%)
	Total	Cultivated	Wild +		
Dicots					
Families	120	50	70	42	58
Genera	180	120	60	67	33
Species*	395	175	190	44	48
Sub-species	25	25	0	100	0
Monocot					
Families	17	10	7	59	41
Genera	50	35	15	70	30
Species*	83	50	20	60	24
Sub-species	10	7	3	70	30
Pteridophyte					
Families	3		3		100
Genera	7		7		100
Species	11		11		100
Thallophytic					
Families	30		30		100
Genera	57		57		100
Species	108		108		100
Gymnosperms					
Families	2		2		100
Genera	2		2		100
Species	2		2		100

** Imported food plants are excluded, +National Seed Committee.*

Source: Ministry of Forests and Soil Conservation (Nepal Biodiversity Strategy, 2002).

Table 7.7 : Distribution of community forests among the physiographic zones (as of June 2013)

Physiographic zone	Number of Districts	User Groups		Households		Coverage	
		Number	%	Number	%	Area (ha.)	%
Total	74.0	18133.0	100.0	2237195.0	100	1700048	100
High Mountains	15	2875	15.9	294532	13.2	270370	15.9
Middle Mountains	36	12056	66.5	1295421	57.9	910379	53.5
Siwaliks (including Inner - Terai)	5	1619	8.9	278784	12.4	321089	18.9
Terai	18	1583	8.7	368458	16.5	198210	11.7

Source : Ministry of Forest and Soil Conservation

Table 7.8 Changes in status of community forestry in between 2008 and 2013

Categories	2008	2013 (June)	% change (2008 -2013)
User Groups	14431	18133	25.7
Households	1660000	2237195	34.8
Forest Area (ha.)	1230000	1700048	38.2

Source : Ministry of Forest and Soil Conservation

Table 7.9 : Vegetation Area by Type and Household Involvement in Community Forest of Nepal, 2011

SN	Vegetation type	CF Area (ha)	% CF Area	No. of HHs*	% HHs
1	Forest	1,134,018.795	68.49	1,316,485	60.31
2	Shrub	129,583.870	7.83	202,500	9.28
3	Forest / Shrub	121,441.799	7.33	121,923	5.59
4	Not Specified	77,233.776	4.66	92,422	4.23
5	Forest / Plantation	69,378.805	4.19	131,734	6.04
6	Plantation	31,235.245	1.89	159,259	7.30
7	Shrub / Plantation	30,922.059	1.87	75,895	3.48
8	Forest /Grass	20,410.265	1.23	14,712	0.67
9	Forest /Shrub / Plantation	11,308.470	0.68	16,881	0.77
10	Forest / Shrub / Grass	6,868.270	0.41	7,129	0.33
11	Shrub / Grass	5,347.450	0.32	8,767	0.40
12	Forest / Shrub / Plantation / Grass	5,294.570	0.32	5,555	0.25
13	Shrub / Plantation / Grass	4,098.960	0.25	5,260	0.24
14	Grass	3,132.992	0.19	12,543	0.57
15	Plantation / Grass	2,750.545	0.17	8,066	0.37
16	Forest / Plantation / Grass	2,633.310	0.16	3,579	0.16

** Note : Households involve in one or more Community Forest ; CF = Community Forest*

Source : Department of Forest (Communtiy Forest Division)

Table 7.10 : Endemic Fishes of Nepal, 2011

S.N.	Scientific Name	Local Name
1	Cyprinus carpio	Common carp
2	Hypophthalmichthys molitrix	Sliver carp
3	Aristichthys nobilis	Bighead carp
4	Ctenopharyngodon iddllus	Grass carp
5	Labeo rohita	Rohu
6	Cirrhinus mrigala	Naini (Mrigal)
7	Catla catla	Bhakue (Catla)
8	Oreochromis niloticus	Tilapia
9	Oncorhynchus mykiss	Rainbow trout
10	Schizothorax spp	Asala
11	Tor spp	Sahar
12	Neolissochellus spp	Katle

Source : Directorate of Fisheries Development

Table 7.11 : Number and Status of Nepal's Fauna

Legend and Summary	Mammal		Bird		Herpeto		Reptiles		Insects		Plants	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
CITES (Total)	**52**	**100.0**	**108**	**100.0**			19	100.00	3	100	154	100.00
Appendix I	32	61.5	12	11.1			2	10.53	0	0	2	1.30
Appendix II	16	30.8	95	88.0			15	78.95	3	100	148	96.10
Appendix III	4	7.7	1	0.9			2	10.53	0	0	4	2.60
IUCN = IUCN Red List Category (Total)	**55**	**100.0**	**149**	**100.0**	**64**	**100.0**					**9**	5.844156
Critically Endangered (CR)	8	14.5	61	40.9	1	1.6					NA	NA
Endangered (EN)	26	47.3	38	25.5	3	4.7					2	1.298701
Vulnerable (VU)	14	25.5	50	33.6	7	10.9					5	3.246753
Near Threatened (NT)	7	12.7	NA	NA	4	6.3					2	1.298701

Source: ICIMOD and Ministry of Forest and Soil Conservation

Table 7.12 : Threatened Medicinal and Aromatic plants in Nepal

S.N.	Plant Species	Nepali Name	Threat Category	
			CAMP	IUCN
1	Acacia catechu (L.f.) Wild	Khayar		T
2	Aconitum balangrense Lauener	Bikh	EN	
3	Aconitum bisma (Buch.-Ham.) Rapaics	Bikh	DD	
4	Aconitum ferox Wall.ex Seringe	Seto bikh	DD	T
5	Aconitum gammiei Stapf	Bikh		T
6	Aconitum heterophyllum Wall.	Atis	V	R
7	Aconitum laciniatum (Bruhl) Stapf	Bikh		T
8	Aconitum spicatum (Bruhl)Stapf	Bikh	V	T
9	Allium hypsistum Stearn	Jimbu	V	
10	Allium przerwalskianum Regel	Jimbu		V
11	Alstonia neruufolia D.Don		EN	R
12	Alstonia scholaris (L.) R.Br.	Chhatiwan	V	R
13	Arisaema costatum (Wall.) Mart.ex.Schott	Sarpako makai	LC	
14	Arnebia benthamii (Wall.ex G.Don) I.M Johnston	Mahaarangi	V	
15	Asparagus racemosus Willd.	Sataawari	V	
16	Bergenia ciliata (Haw.) Sternb.	Paakhandbed		T
17	Butea monosperma (Lam.) Kuntze	Palas	V	EN
18	Corydalis megacalyx Loudlow		EN	
19	Crateva unilocularis Buch.-Ham.	Siplikaan	EN	R
20	Curculigo orchioides Gaertn.	Kalo Musali	V	
21	Dactylorhiza hatagirea (D.Don)Soo	Paanchaunle	EN	
22	Dalbergia latifolia Roxb.	Satisaal		V
23	Delphinium himalayai Munz	Atis	V	
24	Dioscorea deltoidea Wall.	Bhyaakur	EN	T
25	Elaeocarpus sphaericus (Gaertn.) K.Schum.	Rudrakshya		V
26	Ephedra intermedia Schrenk and Meyer	Somlataa	EN	
27	Ephemerantha macraei (Lindl.) P.F. Hunt and Summerh.	Jiwanti	V	
28	Fritillaria cirrhosa D.Don	Kaakoli	V	
29	Gloriosa superba Linn.		EN	
30	Heracleum lallii C. Norman		EN	
31	Jurinea dolomiaea Boiss.	Dhupjadi	NT	
32	Lilium nepalense D.Don	Khiraule	DD	
33	Maharanga bicolor (Wall.ex G.Don)A.DC.	Mahaarangi	DD	
34	Maharanga emodi (Wall.)A.DC.	Mahaarangi	DD	K
35	Meconopsis dhwojii G.Taylor ex Hay		NT	
36	Michelia champaca Linn.	Chaamp	CR	EN
37	Nardostachys grandiflora DC.	Jataamansi	V	V
38	Neopicrorhiza scrophulariifolia (Pennell) Hong	Kutaki	V	
39	Operculina turpethum (L.)S.Manso	Nisoth	EN	
40	Oroxylum indicum(L.)Kurz	Tatelo	EN	
41	Otochilus porrectus Lindl.		EN	
42	Paeonia emodi Wall.	Chandra		V
43	Panax psedo-ginseng Wall.	Mangan	V	
44	Paris polyphylla Smith	Satuwaa	V	V
45	Piper longum Linn.	Pipalaa	V	
46	Pistacia chinensis Bunge subsp. integerrima(J.L.Stewart) Rech.f.	Kaakarsingi		R
47	Podophyllum hexandrum Royle	Laghupatra	V	V
48	Pongamia pinnata (L.)Pierre	Karengi	DD	K
49	Pterocapus marsupium Roxb.	Bijayasaal	CR	
50	Rauvolfia serpentina (L.)Benth.ex Kurz	Sarpagandhaa	CR	EN
51	Rheum australe D.Don	Padamchal	V	V
52	Rheum moorcroftianum Royle	Padamchaal	NT	
53	Rheum nobile Hook.f. and Thoms.	Amalbetas	V	R
54	Rubia manjith Roxb.ex Fleming	Majitho	V	
55	Swertia angustifolia Buch.-Ham. ex D.Don	Bhaale chiraaito	EN	
56	Swertia chirayita (Roxb.ex Fleming) Karstrn	Chiraaito	V	V
57	Swertia multicaulis D.Don	Sarmaaguru	DD	
58	Taxus baccata Linn.	Lauth Salla	EN	
59	Tinospora sinensis (Lour.) Merr.	Gurjo	V	
60	Valeriana jatamansi Jones	Sugandhawaal	V	

Note: CR = Critically endangered, DD= Data deficient, EN= Endangered, K= Insufficiently Known, NT= Nearly threatened, V= Vulnerable, R= Rare and T= Threatened.

Source: Department of Plant Resources,Plants of Nepal : Fact Sheet,2006

Table 7.13 : Threatened Species in the SAARC Member Countries (Taxonomic Group), 2013

Species	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Mammals	11	34	27	95	2	31	24	30
Birds	14	30	18	80	0	33	29	15
Reptiles	1	23	3	52	3	9	10	11
Amphibians	1	1	1	74	0	3	0	56
Fishes	5	18	3	213	18	7	34	43
Molluscs	0	0	0	6	0	1	0	0
Other Invertibrates	1	7	1	128	46	2	18	130
Plants	3	17	9	325	0	9	4	286
Total	**36**	**130**	**62**	**973**	**69**	**95**	**119**	**571**

Source : IUCN Red List version 2013

Table 7.14 : Protected Floral Species in Nepal

S.N.	Scientific Name	English Name	Local Name	Potential Use
I. Banned for collection, transportation and trade				
1	Dactylorhiza hatagirca	Orchid	Panchaunle	Tonic
2	Neopicrorhiza scrophulariifolia	Gention	Kutki*	Medicine
3	Root Bark of Juglans regia	Walnut	Okharko bokra	Medicine
II. Banned for export outside the country without processing				
1	Abies spectabilis		Talispatra	Medicine
2	Cinnamomum glaucescens		Sugandakokila	
3	Lichens	Lichen	Jhyaau	
4	Nardostachys grandiflora	Spikenard	Jatamansi	Medicine
5	Rauvolfia serpentina	Rauwolf	Sarpagandha	Medicine
6	Taxus baccata subsp	Himalayan yew	Lauth salla	Medicine
7	Valeriana jatamansi	Valerian	Sugandhawal	Medicine
III. Banned for felling, transportation and export				
1	Acacia Catecha	Cutch tree	khayar	Medicine
2	Bombax ceiba	Red Cotton tree	Simal	Medicine
3	Dalbergia latifolia	Rose Wood	Satisaal	Timber
4	Juglans regia	Walnut	Okhar	Timber
5	Michelia champaca	Golden Champa	chaamp	medicine , timber
6	Pterocarpus marsupium	Indian Kino tree	Bijayasal	Timber
7	Shorea robusta	Common sal	Saal	Timber

*Note: * Recently the ban has been lifted for products legally harvested from sustainably managed forests.*

Source: Department of Plant Resources,2006

Table 7.15 : Protected Faunal Species included in the National Parks and Wildlife Conservation Act,1973

S.N.	Scientific Name	Local Name	English Name	Status	
				IUCN	CITES Appendix
Mammals					
1	Sus salvanius	Sano bandel	Pigmy hog	Ex	I
2	Ailurus cervicapra	Habrey	Red panda		I
3	Antilope cervicapra	Krishnasar	Black buck	V	III Nep
4	Bos gaurus	Gauri gai	Gaur bison	V	I
5	Bos mutus	Yak nak	Wild yak	E	I
6	Bubalus arnee	Arna	Wild water buffalo	E	III Nep
7	Canis lupus	Bwanso	Gray wolf	V	I
8	Caprotgus hispidus	Hispid Kharayo	Hispid hare	E	I
9	Cervus duvauceli	Barasinghe	Swamp deer	E	I
10	Elephas maximus	Hatti	Asiatic elephant	E	I
11	Felis lynx	Banbiralo	Lynx	E	II
12	Hyanena hyaena	Hundar	Striped hyena	E	
13	Macaca assamensis	Asamese rato bander	Asamese monkey		II
14	Manis crassicaudata	Salak	Indian pangolin		II
15	Manis pentadactyla	Salak	Chinese pangolin		II
16	Moschus chrysogaster	Kasturi mriga	Himalayan forest, musk deer	E	I
17	Ovis ammon	Nayan	Great Tibetan sheep	I	I
18	Panthera tigris	Bagh	Bengal tiger	E	I
19	Panthera uncia	Hiunchituwa	Snow leopard	E	I
20	Pontholops hodgsoni	Chiru	Tibetan antelope		I
21	Neofelis nebulosa	Dwanshe chituwa	Clouded leopard	V	I
22	Platanista gangetica	Souns	Geanetic dolphin	V	I
23	Prionailurus bengolensis	Chari bagh	Leopard cat		II
24	Prionodon pardicolor	Silu	Spotted ling sang		I
25	Rhinoceros unicarnis	Gainda	One horned rhinoceros	E	I
26	Tetrocerus quadricornis	Chauk	Four-horned antelope		III Nep
27	Ursus arctos	Himali rato bhalu	Brown bear		I
Birds					
1	Buceros bicornis	Thulo dhanes	Great- pied hornbill		I
2	Catreus wallichii	Cheer	Cheer pheasant	E	I
3	Ciconia ciconia	Seto stork (saras)	White stork		II
4	Ciconia nigra	Kalo stork	Black stork		II
5	Grus grus	Saras	Souse crane		
6	Eupodotisbengalensis	Khar major	Bengal florican	E	I
7	Lophophorus impejanus	Danfe	Impedance pheasant		I
8	Sypheotides indica	Sano khar major	Lesser florican		III
9	Tragopan satyra	Munal	Crimson-horned pheasant		III Nep
Reptiles					
1	Gavialis gangeticus	Ghadial gohi	Gharial	E	I
2	Python molurus	Azingar	Asiatic rock python	V	I
3	Varanus flavescens	Sun gohori	Golden monitor lizard	I	I

Note: Common name pangolin refers for two main species, as suggested by Bio-diversity Profile Project, 1995.
I = Indeterminate, E = endangered, V = vulnerable, Ex= extinct
Source: Ministry of Environment (State of the Environment, Nepal, 2001) and Department of National park and Wildlife Conservation ,2001/02

Table 7.16 : National Parks, Wildlife Reserves and Conservation Area of Nepal

S.N.	Protected Area	Year of Declaration	Area (sq. km)	Physiographic Zone	Conservation Focus
National Parks					
1	Chitwan National Park	1973	932	Tarai / Siwalik	Rhino , elephant, tiger , bison etc
2	Langtang National Park	1976	1710	High Mountain	Musk, deer, and red panda
3	Rara National Park	1976	106	High Mountain	Musk, deer, red panda and high altitude lake
4	Sagarmatha National Park	1976	1148	High Mountain	Musk, deer, red panda, beer and snow leopard
5	She-Phoksundo National Park	1984	3555	High Mountain	Wild goat, blue sheep, musk deer, lake
6	Khaptad National Park	1984	225	Middle Mountain	Wild goat, blue sheep, spiritual site
7	Bardia National Park	1976 , 1984	968	Tarai	Rhino, elephant, tiger, etc
8	Makalu Barun National Park	1991	1500	High Mountain	High altitude, endangered plants
9	Shivapuri Nagarjun National Park	2002	159	Mid hills	Conservation of capital city
10	Banke National Park	2010	550	Tarai	Tiger, elephant etc
Total			**10853**		
Wildlife Reserves					
1	Shuklaphanta Wildfife Reserve	1976	305	Tarai	Swamp, deer, rhino, tiger etc
2	Koshi Tappu Wildlife Reserve	1976	175	Tarai	Wild buffalo and migratory birds
3	Parsa Wildlife Reserve	1984	499	Tarai / Siwalik	Tiger, deer, antelopes, bison etc
Total			**979**		
Hunting Reserve					
1	Dhorpatan Hunting Reserve	1987	1325	Middle Mountain	Blue sheep
Total			**1325**		
Conservation Area					
1	Annapurna Conservation Area	1992	7629	Middle Mountain	endemic plants and mountain
2	Kanchanjunga Conservation Area	1997	2035	Middle Mountain	endemic plants and mountain
3	Manasalu Conservation Area	1998	1663	High Mountain	endemic plants and mountain
4	krishnasar Conservation Area	2009	16.95	Tarai	blackbuck
5	Gaurisankar Conservation Area	2010	2179	High Mountain	Musk, deer, and red panda etc.
6	Api Nampa Conservation Area	2010	1903	High Mountain	Musk, deer, and red panda etc.
Total			**15425.95**		
Grand Total			**28582.95**		

Source : Department of National Parks and Wildfile Conservation, Annual Report,2010

Table 7.17 : Number of Districts and VDCs with Buffer Zone of Nepal

S.N.	Buffer zones	Declared Year	Area (sq. km)	District	VDCs
1	Chitwan National Park	1996	750	4	37
2	Bardia National Park	1996	507	2	17
		2010	180	1	4
3	Langtang National Park	1998	420	3	34
4	Shey Phoksundo National Park	1998	1349	2	11
5	Makalu Barun National Park	1999	830	2	12
6	Sagarmatha National Park	2002	275	1	3
7	Koshi Tappu Wildlife Reserve	2004	173	3	16
8	Shuklaphanta Wildlife Reserve	2004	243.5	1	12
9	Parsa Wildlife Reserve	2005	298.17	3	11
10	Rara National Park	2006	198	2	9
11	Khaptad National Park	2006	216	4	21
12	Banke National Park	2010	343	4	14
Total			**5782.67**	**32**	**201**

Source : Department of National Park and Wildlife Conservation

Table 7.18 : Ramsar Site of Nepal

S.N.	Name of Ramsar Site (Ramsar Site No.)	Location/District	Inclusion Date	Area (ha.)	Elevation (masl)
1	Koshi Tappu (380)	Koshi	17.12.1987	17500	75-81
2	Beeshazari and Associated Lake (1313)	Chitwan	13.08.2003	3200	286
3	Ghodaghodi Lake Area (1314)	Kailali	13.08.2003	2563	205
4	Jagadishpur Reservoir(1315)	Kapilvastu	13.08.2003	225	197
5	Gokyo and Associated Lakes(1692)	Solukhumbo	23.09.2007	7770	4700-5000
6	Gosaikund and Associated Lakes (1693)	Rasuwa	23.09.2007	1030	4000-4700
7	Phoksundo Llake (1694)	Dolpa	23.09.2007	494	3611.5
8	Rara Lake (1695)	Mugu	23.09.2007	1583	2990
9	Mai Pokhari (1850)	Ilam	28.10.2008	90	2100

Source: Department of National Park and Wildlife Conservation, 2014

Table 7.19 : World Heritage Sites of Nepal

S. N.	World Heritage	Place of Establishment	Existed Year
1	Hanumandhoka Durbar Square	Kathmandu	613 A.D.
2	Patan Darbar Square	Lalitpur	1565 A.D.
3	Bhaktapur Darbar Square	Bhaktapur	1427 A.D .
4	Pashupatinath Temple	Kathmandu	5th Century
5	Swayambhunath Stupa	Kathmandu	5th Century
6	Bouddhanath Stupa	Kathmandu	5th Century
7	Changunarayan Temple	Bhaktapur	306 A.D.
8	Chitwan National Park	Chitwan	1974 A.D.
9	Sagarmatha National Park	Solukhumbhu	1976 A.D.
10	Lumbini	Rupandehi	1997 A.D.

Source: Department of Information, Nepal, April-May, 2002.

Table 7.20 : Major Mountain Peaks of Nepal

S.N.	Name of Peak	Elevation (masl)	Latitude	Longitude
1	Mount Everest (Sagarmatha)	8848	$27^0$59'17"	$86^0$55'31"
2	Mount Kanchenjunga	8586	$27^0$42'09"	$88^0$09'25"
3	Mount Lhotse	8516	$27^0$57'45"	$86^0$56'03"
4	Mount Yalung Kang	8505	$27^0$45'15"	$88^0$08'25"
5	Mount Makalu	8463	$27^0$53'23"	$87^0$05'20"
6	Mount Cho-Oyu	8201	$28^0$05'37"	$86^0$39'43"
7	Mount Dhaulagiri	8167	$28^0$41'46"	$83^0$29'43"
8	Mount Manaslu	8163	$28^0$32'58"	$84^0$33'43"
9	Mount Annapurna I	8091	$27^0$51'42"	$86^0$51'50"

masl= metre above sea level

Source : Ministry of Culture, Tourism and Civil Aviation (Mountaineering in Nepal Facts and Figures,2007)

Table 7.21 : Central Zoo (Sadar Chidiya Khana) of Nepal

Location : Jawalakhel, Lalitpur

Area: 106 Ropani

Established Year : 1875 A.D.

	Mammals		Birds		Reptiles		Fishes		Total	
Year	Species	Number	Species	Number	Species	Number	Species	Number	Species	Number
2008/09	31	212	52	270	10	23	17	364	110	869
2009/10	33	221	51	232	10	24	14	418	108	895
2010/11	34	197	58	434	10	24	14	199	116	854
2011/12	35	207	57	359	11	27	16	281	119	874
2012/13	36	196	53	330	11	26	16	345	116	897

Source: Central Zoo

Table 7.22 : Major Botanical Garden of Nepal

S.N.	Name of Garden	Location and District	Area (ha.)	Elevation (masl)	Established Year
1	National botanical garden	Godawari,Lalitpur	85	1515	1962
2	Maipokhari botanical garden	Maipokhari,Ilam	1.5	2200	1962
3	Dhanush botanical garden	Dhanushadham,Dhanusha	120	NA	1998
4	Vrindaban botanical garden	Hetauda, Makawanpur	96	500	1962
5	Daman botanical garden	Daman, Makawanpur	65	2140	1962
6	Tistung botanical garden	Tistung, Makawanpur	60	1700	1962
7	Dhakeri botanical garden	Dhakeri,Banke	5	130	1990
8	Mulpani botanical garden	Kapurkot,Salyan	5.7	2000	1990
9	Dhitalchor botanical garden	Jumla	4	2500	1990
10	Deoria botanical garden	Dhangadhi, Kailali	100	110	1998
11	Godawari botanical garden	Godawari, Kailali	100	NA	1998
12	World peace Biodiversity Garden	Pokhara , Kaski	147.48	775-1078	2013

Source: Department of Plant Resource

Table 7.23 : Mineral Resources of Nepal

S.N.	District	Metallic Minerals	Non-Metallic Minerals			Fuel Minerals and Thermal Springs
			Chemicals,Fertilizers, Insulators, Ceramics, Refractories and Abrasives	Germ Minerals	Construction Materials	
1	Taplejung	Arsenic,Copper,Iron,Lead,Tantalum-Noibium	Corundum,Garnet,Graphite, Mica	Aquamarine/Beryl, Quartz ,Tourmaline	Granite,Marble	
2	Panchthar		Garnet	Tourmaline		
3	Ilam	Arsenic,Bismuth,Copper,Gold,Lead,Nickel,Silver, Tungsten,Zinc	Corundum,Graphite,Mica, Pyrite	Tourmaline		
4	Jhapa		Mica			Coal,Oil and Gas
5	Morang					
6	Sunsari	Copper	Phosphorite			Coal
7	Dhankuta	Copper	Clay,Phosphorite	Tourmaline	Limestone,Marble, Quartzite	
8	Terhathum					
9	Sankhuwasabha	Copper,Lead,Tantalum-Noibium, Tungsten,Zinc	Barite,Feldspar,Garnet,Graphite , Pegmatite	Aquamarine/Beryl, Kyanite, Quartz, Tourmaline	Granite,Limestone	
10	Bhojpur	Copper,Gold	Mica,Talc	Aquamarine/Beryl		
11	Solukhumbu	Bismuth,Copper, Lead, Molybdenum, Zinc			Granite	
12	Okhaldhunga	Copper				
13	Khotang				Limestone	
14	Udayapur	Arsenic,Bismuth,Copper	Clay,Dolomite,Magnesite, Mica, Pegmatite		Granite, Limestone	Coal
15	Saptari					
16	Siraha					
17	Dhanusa					Coal, Geothermal Hot Springs
18	Mahottari					
19	Sarlahi					
20	Sindhuli	Lead,Nickel,Uranium,Zinc	Mica,Pegmatite		Granite,Limestone	
21	Ramechhap	Arsenic,Chromium,Cobalt,Copper,Iron,Nickel, Titanium			Slate	
22	Dolakha	Copper,Tungsten	Magnesite,Ocher,Pyrite,Talc		Quartzite,Slate	
23	Sindhupalchok	Copper,Iron	Magnesite, Mica, Ocher, Pegmatite,Pyrite,Talc	Aquamarine/Beryl	Quartzite,Slate	Geothermal Hot Springs
24	Kavrepalanchowk	Cobalt,Iron,Lead,Nickel,Tin,Zinc	Clay,Dolomite		Granite,Limestone, Marble, Slate	
25	Lalitpur	Bismuth,Copper,Iron,Lead,Molybdenum, Silver, Tin,Zinc	Barite,Clay,Ocher		Granite,Limestone, Marble	Coal
26	Bhaktapur		Clay			
27	Kathmandu	Gold,Uranium	Clay,Mica,Pegmatite,Pyrite, Sillimanite	Aquamarine/Beryl ,Tourmaline	Limestone	Coal,Oil and Gas
28	Nuwakot	Copper,Gold	Graphite,Mica,Pegmatite	Quartz	Slate	
29	Rasuwa	Antimony,Arsenic,Bismuth,Cadmium,Cobalt, Lead,Lithium, Mercury,Silver,Zinc	Mica,Pegmatite,Pyrite	Ruby-Sapphire, Tourmaline	Slate	Geothermal Hot Springs
30	Dhading	Antimony,Arsenic,Bismuth,Cadmium,Cobalt, Copper,Gold, Iron,Lead,Mercury,Silver,Zinc	Corundum,Mica,Pyrite,Talc	Aquamarine/Beryl , Ruby-Sapphire	Basic rock, Granite , Limestone,Slate	
31	Makwanpur	Antimony,Arsenic,Bismuth,Copper,Gold,Iron, Lead,Mercury, Molybdenum, Silver,Tantalum-Noibium, Tin,Tungsten,Uranium, Zinc	Barite,Calcite, Clay,Pegmatite ,Pyrite,Silica sand,Talc		Basic rock ,Granite, Limestone, Marble, Quartzite,Slate	Coal
32	Rautahat					Coal
33	Bara		Silica sand			Coal
34	Parsa		Clay			
35	Chitawan	Copper,Gold,Iron,Uranium	Talc		Slate	
36	Gorkha	Bismuth,Copper,Gold,Tantalum-Noibium	Feldspar,Pyrite		Granite,Syenite	
37	Lamjung		Common Salt	Tourmaline		Geothermal Hot Springs
38	Tanahu	Copper,Gold,Iron,Lead,Zinc	Pyrite,Talc		Slate	
39	Syangja	Copper	Pyrite		Limestone,Quartzite,Slate	
40	Kaski		Talc			Geothermal Hot Springs

Table 7.23 : Mineral Resources of Nepal

(contd...)

S.N.	District	Metallic Minerals	Non-Metallic Minerals			Fuel Minerals and Thermal Springs
			Chemicals,Fertilizers, Insulators , Ceramics, Refractories and Abrasives	Germ Minerals	Construction Materials	
41	Manang			Aquamarine/Beryl , Tourmaline	Granite	
42	Mustang	Gold	Common Salt		Granite, Gypsum, Slate	Coal
43	Myagdi	Copper,Gold,Iron	Talc		Slate	Geothermal Hot Springs,Oil and Gas
44	Parbat	Copper,Gold,Iron,Lead			Quartzite	
45	Baglung	Copper, Iron, Lead, Zinc	Talc		Slate	
46	Gulmi	Cobalt, Copper, Iron, Lead, Silver, Zinc			Slate	
47	Palpa	Copper,Iron,Silver	Dolomite,Magnesite		Limestone,Slate	Coal
48	Nawalparasi	Copper,Iron				
49	Rupandehi					
50	Kapilbastu					
51	Arghakhanchi	Cobalt, Lead, Molybdenum, Silver, Zinc	Barite, Clay, Dolomite		Limestone	
52	Pyuthan	Iron, Lead, Silver	Barite, Phosphorite		Limestone	
53	Rolpa	Arsenic, Copper, Gold, Iron, Molybdenum	Barite		Gypsum	Coal
54	Rukum	Copper,Gold				
55	Salyan	Iron	Calcite		Limestone	
56	Dang	Copper,Lead	Clay,Phosphorite		Limestone	Coal,Geothermal Hot Springs,Oil and Gas
57	Banke					
58	Bardiya					
59	Surkhet	Copper,Gold,Iron	Barite,Clay,Dolomite,Talc		Basic rock,Limestone	
60	Dailekh				Basic rock,Granite,Slate	Oil and Gas
61	Jajarkot	Iron		Aquamarine/Beryl,Kyanite, Tourmaline		
62	Dolpa	Iron	Common Salt		Granite	
63	Jumla				Basic rock	Geothermal Hot Springs
64	Kalikot		Pyrite			
65	Mugu	Copper,Iron,Lead,Zinc	Common Salt		Granite	
66	Humla	Iron,Lead,Zinc			Granite	
67	Bajura	Copper,Gold,Iron,Lead,Uranium	Phosphorite		Basic rock	
68	Bajhang	Antimony,Arsenic,Bismuth,Chromium,Cobalt, Copper,Gold, Iron,Lead, Lithium,Molybdenum,Nickel,Tin, Uranium, Zinc	Magnesite, Mica, Pegmatite, Phosphorite, Pyrite	Aquamarine/Beryl	Basic rock, Granite, Quartzite,Slate	Geothermal Hot Springs
69	Achham	Gold,Lead,Uranium	Mica, Pegmatite, Pyrite	Kyanite	Basic rock	
70	Doti	Copper, Gold, Iron, Lithium, Tin	Mica, Pegmatite	Aquamarine/Beryl	Basic rock,Granite,Slate	Coal
71	Kailali	Gold				
72	Kanchanpur					
73	Dadeldhura	Arsenic,Bismuth,Copper,Gold, Lead, Molybdenum, Nickel, Silver,Tin, Tungsten, Zinc			Granite	
74	Baitadi	Copper,Gold,Iron,Lead,Uranium, Zinc	Dolomite,Magnesite,Phosphorite		Basic rock,Limestone	
75	Darchaula	Copper,Gold,Iron,Uranium	Dolomite,Magnesite,Pyrite		Basic rock,Quartzite,Slate	Geothermal Hot Springs

Source: Department of Mines and Geology (Mineral Resources of Nepal,2004)

Chapter VIII

Waste

Table 8.1 : Solid Waste Generation and Disposal Cost by Municipalities

S.N.	Municipality	Quantity (mt.) per day							Cost (Rs per day)*						
		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
1	Amargadhi	0.7	1.3	NA	1.3	2.0	0.5	NA	NA	1370	1370	713	750	2055	NA
2	Baglung	4.0	4	4.0	16.0	16.0	NA	0.7	2262	2735	3779	4500	4500	NA	12337
3	Banepa	4.5	4.5	4.5	0.9	6.5	6.5	1.6	4521	11206	12296	7718	5100	13973	NA
4	Bhadrapur	2.5	1.0	1.0	0.9	5.0	5.0	5.0	3000	2953	2491	4205	1696	4276	4928
5	Bhaktapur	2.0	2.2	4.8	23.7	26.0	30.0	24.2	18748	44000	57195	73705	19250	NA	136654
6	Bharatpur	1.2	1.0	NA	20.0	20.2	22.0	25.0	10444	6780	6780	7582	12500	32140	120342
7	Bhimdatta	9.0	3.5	3.2	2.1	5.1	4.0	11.9	12	2142	5479	3700	6049	6300	20816
8	Bhimeswor	3.0	1.5	NA	3.0	3.0	4.9	4.9	800	379	959	6575	6600	1080	6243
9	Bidur	4.0	5.0	4.0	5.0	9.2	NA	10.0	1000	1740	3248	2410	2546	NA	21202
10	Biratnagar	39.6	21.0	NA	5.2	116.0	70.0	2.3	2739	27789	17984	8400	9100	24657	NA
11	Birendranagar	1.2	1.5	0.5	5.0	5.0	4.0	1.5	2191	560	3702	2899	6115	8918	12219
12	Birganj	35.0	35.0	41.1	52.0	30.0	63.0	11.3	73150	1000	1000	8400	55873	183000	65418
13	Butawal	18.0	NA	12.5	0.6	44.4	45.0	47.0	15068	21918	21918	1274	20018	45008	41095
14	Byas	4.8	7.0	6.0	10.0	11.0	0.1	8.0	1760	2460	4280	2142	2803	7942	12857
15	Damak	5.0	4.3	4.0	0.5	7.0	10.0	9.9	1918	1643	1924	838	2155	6849	12630
16	Dasharathchanda	2.0	1.0	NA	1.4	NA	NA	NA	2200	548	585	275	569	NA	NA
17	Dhangadhi	1.6	1.1	NA	1.5	1.6	3.0	30.0	690	6000	7123	2324	2545	43000	19372
18	Dhankuta	0.7	NA	NA	10.0	0.8	NA	5.8	1470	1470	1470	5000	4700	NA	18630
19	Dharan	7.0	3.0	4.7	0.0	48.0	37.9	50.2	4000	10958	10370	2740	8727	33356	34345
20	Dhulikhel	3.0	5.0	1.8	0.3	0.4	0.4	NA	1644	1849	1353	986	2147	41918	NA
21	Dipayal Silgadhi	NA	NA	1.0	0.6	1.0	1.0	0.1	438	443	443	502	420	NA	2339
22	Gaur	1.5	7.0	0.4	1.7	1.4	2.2	3.9	2824	2000	4110	2500	3662	2014	NA
23	Ghorahi	6.0	1.6	0.8	0.7	12.1	12.0	14.0	3780	5931	7684	1750	7645	19000	24241
24	Gorkha	2.5	2.0	0.4	1.4	12.6	1.3	10.0	930	1200	613	578	655	2000	NA
25	Guleriya	6.0	3.0	1.6	0.1	0.1	NA	4.5	700	1500	1323	647	700	NA	4852
26	Hetauda	10.0	NA	NA	12.7	15.1	0.6	15.1	1095	1095	1095	7638	9858	4900	NA
27	Ilam	2.0	6.0	NA	0.9	0.9	0.9	0.9	40720	500	500	2219	2929	11000	7205
28	Inaruwa	0.2	0.2	2.0	1.7	1.7	11.4	1.4	9040	1600	1384	4658	1169	1000	5627
29	Itahari	16.8	9.0	22.5	2.7	11.0	28.8	15.0	NA	30137	4658	1132	2700	22000	18715
30	Jaleshwor	3.0	5.0	NA	2.2	5.9	NA	NA	2909	3512	3512	2218	2218	NA	NA
31	Janakpur	5.0	1.5	11.2	5.9	6.1	6.0	6.0	11501	11501	15213	4335	NA	37000	36758
32	Kalaiya	NA	1.5	1.2	11.0	5.0	52.1	52.1	4730	4667	548	4000	6000	18000	NA
33	Kamalamai	5.0	3.5	2.0	5.0	5.0	3.4	3.5	505	821	610	400	517	7000	2882
34	Kapilbastu	4.0	NA	2.0	NA	3.0	0.1	1.1	1726	1726	2740	NA	1507	5000	5863
35	Kathmandu	29.9	30.6	30.6	318.4	435.0	449.0	457.0	16838	16938	16938	17654	195410	NA	NA
36	Khadbari	NA	NA	NA	NA	0.1	NA	NA	1000	100	NA	100	250	NA	NA
37	Kirtipur	1.2	1.2	1.2	10.3	8.8	12.1	31.0	9377	257	257	95410	2000	NA	99015
38	Lahan	0.4	0.4	0.1	0.6	0.6	0.7	1.1	2269	6690	4110	699	669	1000	1290
39	Lalitpur	15.0	15.0	7.5	65.0	65.0	65.0	65.0	15635	68493	82192	68325	68325	86000	140367
40	Lekhnath	NA	NA	NA	NA	NA	NA	6.7	NA	100	100	NA	25	NA	2191
41	Madhyapur Thimi	14.0	9.0	NA	16.0	16.0	17.0	17.0	1507	3192	4110	1436	3680	5000	5000
42	Malangawa	1.0	2.0	1.7	2.0	5.0	NA	5.5	2100	1616	1616	1780	2889	NA	5479
43	Mechinagar	4.5	6.0	4.5	0.3	9.4	5.5	2.7	2055	1863	1365	4973	1600	10553	15586
44	Narayan	0.3	NA	0.5	1.5	0.3	0.4	1.0	300	986	986	700	1256	2000	NA
45	Nepalgunj	15.9	18.0	4.6	38.4	28.5	28.0	3.7	16358	20821	8481	34663	15398	50000	36942
46	Panauti	1.0	1.0	0.1	21.0	NA	0.1	0.8	1500	1750	1145	1748	3374	4000	NA
47	Pokhara	25.0	47.0	47.4	80.0	84.0	84.0	83.0	NA	40066	36156	18493	25151	82000	92362
48	Putalibazar	0.4	0.1	1.2	1.1	1.8	2.0	4.0	1125	1500	2192	364	1338	7000	986
49	Rajbiraj	0.4	0.2	1.0	0.8	0.2	14.4	1.9	300	3100	1644	7756	2527	14753	10416
50	Ramgram	2.0	NA	1.5	0.1	0.1	NA	0.4	766	1212	1212	500	650	NA	2191
51	Ratnanagar	5.0	NA	4.0	5.0	5.1	9.0	10.0	1247	2411	2411	1031	3900	14000	NA
52	Siddharthanagar	5.0	NA	14.0	0.6	20.7	30.0	29.6	800	800	9121	11301	5348	24000	20569
53	Siraha	0.1	0.1	0.1	1.0	1.0	1.1	1.1	684	1457	1457	4125	4240	4000	1071
54	Tansen	8.0	9.5	2.6	1.6	14.4	5.9	6.9	4500	5480	5205	8321	3500	12329	13287
55	Tikapur	4.0	0.5	0.5	0.7	12.0	0.1	7.7	338	1100	345	235	1126	7000	9315
56	Triyuga	NA	NA	0.1	0.8	0.2	6.0	0.1	450	450	753	1000	981	4485	4224
57	Tulsipur	4.4	0.6	0.2	0.2	6.0	6.0	6.0	2024	2502	3014	545	3000	6938	11279
58	Waling	1.0	0.7	0.99	NA	NA	1.1	0.20	421	700	669	301	636	1844	2950

**cost is estimated on the annual budget of waste management of municipalities.*
Source: Municipalities.

Table 8.2 : Solid Waste Generation and Disposal Cost by Districts Headquarter of VDC

S.N.	District	VDC	Quantity (mt.) per annual					Management Cost (Rs'000 / annual)				
			2008/09	2009/10	2010/11	2011/12	2012/13	2008/09	2009/10	2010/11	2011/12	2012/13
1	Taplejung	Fungling	541.0	418.0	72.0	NA	NA	444	392	207	NA	NA
2	Panchthar	Phidim	NA	0.7	NA	210.0	337.0	92	659	60	350	544
3	Terhathum	Myanlung	NA	3.3	1204.5	NA	278.0	120	120	785	NA	1460
4	Bhojpur	Bhojpur	3.7	100.0	5.0	NA	NA	60	42	NA	NA	NA
5	Solukhumbu	Salleri	8.0	304.0	10.0	101.0	38.0	60	321	188	100	NA
6	Okhaldhunga	Okhaldhunga	60.0	138.0	72.0	55.8	126.4	77	155	95	1035	NA
7	Khotang	Diktel	20.0	87.0	NA	4.0	8.6	10	NA	NA	NA	1417
8	Ramechhap	Manthali	NA	NA	1440.0	NA	NA	NA	NA	524	NA	NA
9	Sindhupalchok	Chautara	NA	NA	199.0	45.0	278.0	NA	NA	150	NA	NA
10	Rasuwa	Dunche	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	Dhading	Nilakantha	300.0	540.0	NA	210.0	NA	189	366	NA	804	NA
12	Lamjung	Besisahar	186.0	1080.0	115.0	960.0	NA	2530	2530	304	1330	NA
13	Manang	Chame	29.0	247.0	NA	NA	NA	56	150	NA	NA	NA
14	Mustang	Mustang	NA	0.1	NA	NA	NA	NA	NA	NA	NA	NA
15	Myagdi	Arthunge	NA	82.6	NA	NA	86.4	NA	495	NA	NA	1100
16	Parbat	Shiwalaya	50.0	175.0	365.0	365.0	128.1	629	245	604	858	775
17	Gulmi	Tamghas	NA	10.0	1000.0	1035.0	1015.0	500	500	500	1650	841
18	Arghakhachi	Sandhikhark	416.0	110.0	110.0	365.0	128.1	400	690	700	250	1260
19	Pyuthan	khalanga	NA	56.0	50.0	120.0	155.0	NA	NA	NA	50	90
20	Rolpa	Liwang	NA	38.0	648.0	185.0	600.0	NA	106	240	87	535
21	Rukum	Khalanga	25.0	51.0	52.0	27.0	74.2	NA	150	50	196	2150
22	Salyan	Khalanga	NA	NA	NA	NA	NA	NA	96	10	NA	NA
23	Jajarkot	khalanga	12.0	21.0	22.0	11.6	17.5	24	38.5	39	20	500
24	Dolpa	Dunai	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25	Jumla	Chandannath	1.0	20.0	90.0	NA	NA	66	50	75	NA	NA
26	Kalikot	Manma	NA	NA	33.0	NA	NA	NA	66	na	NA	NA
27	Mugu	Shree Nagar	NA	NA	61.0	NA	NA	NA	NA	45	NA	NA
28	Humla	Humla	NA	NA	NA	NA	NA	NA	41	NA	NA	NA
29	Bajura	Bajura	4.7	31.0	31.0	NA	4.5	96	96	91	NA	250
30	Bajhang	Bajhang	NA	15.0	13.0	NA	NA	NA	20	55	NA	NA
31	Achham	Mangalsen	NA	NA	NA	NA	11.6	NA	NA	NA	NA	303
32	Darchula	Khalanga	NA	NA	365.0	NA	NA	48	96	258	818	NA

Source: District Headquarter of Village Development Committee

Table 8.3 : Daily Solid Waste Generation in Kathmandu Metropolitan City

Waste Generation	Unit	Year								
		2004	2005	2006	2007	2008	2009	2010	2011	2012
Sources										
Household Waste	ton/day	200	246	248	253	261	269	300	330	339
Commercial Waste	ton/day	30	30	30	30	31	32	45	50	51
Institutional Waste	ton/day	30	0	0	0	0	0	0	0	0
Street Waste	ton/day	30	30	30	30	31	32	45	50	51
Waste from VDCs	ton/day	30	30	30	30	31	32	45	50	51
Total	**ton/day**	**320**	**336**	**338**	**343**	**354**	**365**	**435**	**480**	**492**
Waste Collection System										
Roadside Collection	ton/day	168	175	175	171	195	192	274	358	360
Door to door Collection	ton/day	110	110	110	110	110	110	110	43	43
Container Collection	ton/day	21	21	21	21	21	21	21	60	60
Total	**ton/day**	**299**	**306**	**306**	**302**	**326**	**323**	**405**	**461**	**463**
Un-collected Waste	ton/day	21	30	32	41	28	42	30	18	28
Waste Generation rate	**kg/day/p**	**0.25**	**0.30**	**0.30**	**0.30**	**0.30**	**0.30**	**0.30**	**0.3**	**0.3**

Source: Kathmandu Metropolitan City Office (Solid Waste Management Section).

Table 8.4 : Daily Solid Waste Generation in Municipalities of Kathmandu Valley by type of Waste

(in %)

Waste Material	Kirtipur						Kathmandu						Lalitpur						Bhaktapur						Madhyapur Thimi					
	2000	2005	2006	2009	2011	2012	2001	2005	2006	2009	2011	2012	2004	2005	2006	2009	2011	2012	2003	2005	2006	2009	2011	2012	2003	2005	2006	2009	2011	2012
Organic	74.0	75.0	74.2	74.2	74.3	74.2	69.0	70.9	69.0	63.2	63.20	63.2	67.5	67.5	67.5	60.6	71.6	67.5	70.2	75.0	75.0	71.0	70.7	70.7	70.1	75.0	75.0	75.0	75.0	75.0
Paper	3.0		5.7	5.6	5.7	5.7	9.0	8.5	9.0	9.0	9.02	9.0	8.8		8.8	13.2	9.4	8.8	2.4		3.3	2.8	3.5	3.5	4.9		6.0	6.0	6.0	6.0
Rubber	1.0		0.1	0.9	0.1	0.1	1.0	0.5	1.0	1.2	1.20	1.2	0.3		0.2	1.7	0.6	0.7	0.1			0.3	0.3	0.3	0.6		1.0	2.0	1.0	na
Laether	2.0		0.9	0.9	0.9	0.9	0.0	0.1			na	na			0.2	0.0	0.6	0.8					na				1.0		1	na
Wood	0.0		0.1	0.1	1.1	1.1	0.0					na	0.6		0.6	1.0	na	0.7				0.2	0.2	0.2					na	na
Plastic	9.0	9.0	8.8	8.8	8.8	8.8	9.0	9.2	9.0	10.8	10.80	10.8	11.4	15.4	11.4	10.0	12.1	11.4	3.2	6.4	3.4	6.5	7.0	7.0	8.3	20.0	5.0	5.0	5.0	5.0
Textile /Cloth	6.0		1.9	1.9	0.9	0.9	0.0	3.0	3.0	2.3	2.30	2.3	3.6		3.6	5.1	4.0	3.7	1.7	3.0	3.0	3.4	3.2	3.2	2.3		1.0		na	na
Metal			1.9	1.9	2.0	2.0	1.0	0.9	1.0	0.4	0.40	0.4	0.9		0.9	1.7			0.1		0.3	0.4	0.4	0.4	0.3			3.0		3.0
Inert							0.0	4.3								0.0			21.1						12.0					na
Glass	1.0		2.9	2.9	2.9	2.9	3.0	2.5	3.0	5.4	5.40	5.4	1.6		1.3	2.8	1.7	0.9	1.3		1.5	2.1	2.3		1.3		2.0	2.0	2.0	2.0
Medical waste											4.00							2.3							0.2					na
Construction material							2.0	0.0	2.0	4.5	4.50	4.5				2.5					11.1	12.1	11.1							10	na
Others	4.0	16.0	3.4	2.8	3.4	3.4	3.0	0.0	3.0	3.1		3.1	5.3	17.1	5.6	2.0		2.3	0.1	18.6	2.5	1.1			0.2	5.0	9.0	7.0		9.0
Average Collection (%)								**90.0**	**91.0**										**51.3**						**47.2**					

Table 8.5 : Amount of Date Expired (Obsolate) Pesticides in Nepal

S.N.	Location and Pesticide Type	Old Stocks(mt.)
1	**Agriculture Input Corporation (AIC) , Amlekhgang**	
	Choradane	1.20
	DDT	3.20
	Endrin	1.20
	BHC	6.80
	Lindane	0.50
	Organo-murcury fungicide	7.40
	Unidentified dust	22.50
	Agrimycin Bactericide	0.50
	Organophosphate liquid	1.20
	Atrazine liquid	0.40
	Diathane WP	2.00
	2,4-D WP	1.00
	Zine phosphide	1.00
	Aluminium phoshide	2.00
	Sub Total	**50.90**
2	**AIC,Nepalganj and others**	**14.473**
3	**Entomology Division,NARC, Khumaltar**	
	Organophosphate Compounds	3.879
	Orgnochlorine Compounds	0.155
	Organo-murcury Compounds	0.727
	Sub Total	**4.761**
4	**Cotton Development Board, Nepalganj**	
	Organophosphate Compounds	3.711
	Sub Total	**3.711**
5	**Agriculture Development Office, Banke**	
	Organophosphate Compounds	0.31
	Benzine	0.01
	Sub Total	**0.32**
6	**Directorate of Horticulture Development ,Kritipur**	
	Methyl Bromide(MB)	21 cylinder of 50 kg.wt.
7	**Plant Pathology division NARC,Khumaltar**	
	Methyl Bromide(MB)	22 cylinder of 50 kg. wt.
8	**Unsafely stored Date expired BHC dust in Hetaunda(most probably will be transfered into NSC Store,Hetaunda in near future)**	**1.65**
	Total	**75.815 m.ton.+43 cylinder of 50 kgwt MB**

Source: Pesticide Registration and Management Section (A Handbook of Pesticide Statistics,2010)

Table 8.6: Urban Sewerage Services by Municipality, 2013

(length in km.)

S.N.	Municipality	Length of Sewerage within Municipality			Population 2011	Urban Population per km. Sewerage service
		Sewerage	Nali	Total		
1	Amargadhi	0	4.6	4.6	22,241	4835
2	Baglung	0	24.01	24.01	30,763	1281
3	Banepa	15	4	19	24,894	1310
4	Bhadrapur	0	5.47	5.47	18,646	3409
5	Bhaktapur	0	0.45	0.45	83,658	185907
6	Bharatpur	0	38.13	38.13	147,777	3876
7	Bhimdatta	0	6.5	6.5	106,666	16410
8	Bhimeshwor	0	61	61	23,337	383
9	Bidur	0	4.55	4.55	27,953	6144
10	Biratnagar	0	82	82	204,949	2499
11	Birendranagar	0	25.93	25.93	52,137	2011
12	Birgunj	0	59.39	59.39	139,068	2342
13	Butwal	0	325	325	120,982	372
14	Byas	0	9.83	9.83	43,615	4437
15	Damak	7.69	2.71	10.4	75,743	7283
16	Dasharathchanda	0	0	0	17,427	0
17	Dhangadhi	0	12.42	12.42	104,047	8377
18	Dhankuta	0	27.72	27.72	28,364	1023
19	Dharan	0	109.82	109.82	119,915	1092
20	Dhulikhel	2.15	4.3	6.45	16,263	2521
21	Dipayal	0.8	1.25	2.05	26,508	12931
22	Gaur	0	5	5	35,370	7074
23	Ghorahi	2.22	6.42	8.64	65,107	7536
24	Gorkha	0	14.6	14.6	33,865	2320
25	Gulariya	0	10.66	10.66	57,232	5369
26	Hetauda	14.5	14.3	28.8	85,653	2974
27	Ilam	0	35	35	19,427	555
28	Inaruwa	22.84	47	69.84	28,923	414
29	Itahari	25	105	130	76,869	591
30	Jaleshwor	0	9.2	9.2	24,765	2692
31	Janakpur	17	100	117	98,446	841
32	Kalaiya	0	30.6	30.6	43,137	1410
33	Kamalami	1	9.11	10.11	41,117	4067
34	Kapilvastu	4.54	3.57	8.11	30,890	3809
35	Kathmandu	750	4.75	754.75	1,003,285	1329
36	Khandbari	1.1	0	1.1	26,658	24235
37	Kirtipur	15.22	7.86	23.08	67,171	2910
38	Lahan	0	11.18	11.18	33,927	3035
39	Lalitpur	3.71	0	3.71	226,728	61113
40	Lekhnath	0.3	3	3.3	59,498	18030
41	Madhyapur Thimi	4.57	0	4.57	84,142	18412
42	Malangawa	0	11	11	25,143	2286
43	Mechinagar	0	24.85	24.85	57,909	2330
44	Narayan	0	12.42	12.42	21,995	1771
45	Nepalgunj	0	0	0	73,779	0
46	Panauti	5.15	15.3	20.45	28,312	1384
47	Pokhara	0	6.5	6.5	264,991	40768
48	Putalibazar	0.85	3.91	4.76	31,338	6584
49	Rajbiraj	0.62	0.58	1.2	38,241	31868
50	Ramgram	0	8.4	8.4	28,973	3449
51	Ratnanagar	1.6	2.6	4.2	46,607	11097
52	Siddharthanagar	0	41.6	41.6	64,566	1552
53	Siraha	0	6.65	6.65	28,831	4335
54	Tansen	5.16	11.55	16.71	31,161	1865
55	Tikapur	0	4.7	4.7	56,983	12124
56	Triyuga	0	15.72	15.72	71,405	4542
57	Tulsipur	1.5	19.61	21.11	52,224	2474
58	Waling	0	15.66	15.66	24,199	1545
Total		**902.52**	**1427.38**	**2329.9**	**4523820**	**1942**

Source : Ministry of Local Development and Central Bureau of Statistics

Table 8.7 : Estimation of waste generation, based on waste categories

S.No.	Waste type	Kg/day/patient
1	General	1.6
2	Recyclable	0.41
3	Infectious	0.47
4	Pharamaceutial	0.2
5	Sharp waste	0.18
6	Chemical	0.1
7	Radioactive waste	0.02
Total		**3.0**

Total waste production in healthcare institutions was 3.0 kg/day/ patient out of which health care risk waste= 1.0 kg/day/ patient and health care non risk waste = 2.0 kg/day/patient

Source: Nepal Health Research Council(Assesing the Biomedical Waste management Practice Among the Health Care Institution of Nepal 2013)

Table 8.8 : Emission Guidelines for Hospital / Medical / Infectious Waste by Incinerator

Pollutant	Small	Medium	Large
Particular matter	(<=91 kg/h)	(>91-227kg/h)	(>227 kg/h)
	115 mg m^3	69 mg/ m^3	
Carbon monoxide (Co)	40 ppmv	40ppmv	
Dioxins / furans	125 mg/m^3	125 mg/m^3	125 mg/m^3
	Total CCD/CCF or	Total CCD/CCF or	Total CCD/CCF or
	2.3mg /m^3 TEQ	2.3mg/m^3 TEQ	2.3mg/m^3 TEQ
Hydrogen Chloride (HCl)	100 ppmv or	100 ppmv or	100 ppmv or
	93 % reduction	93 % reduction	93 % reduction
Sulfur dioxide ($SO_{2)}$	55 ppmv	55 ppmv	55 ppmv
Nitrogen oxides	250 ppmv	250 ppmv	250 ppmv
Lead	1.2 mg/m^3 or	1.2 mg/m^3 or	1.2 mg/m^3 or
	70 % reduction	70 % reduction	70 % reduction
Cadmium	0.16 mg/m^3 or	0.16 mg/m^3 or	0.16 mg/m^3 or
	65 % reduction	65 % reduction	65 % reduction
Mercury	0.55 mg/m^3 or	0.55 mg/m^3 or	0.55 mg/m^3 or
	85 % reduction	85 % reduction	85 % reduction

Source: World Health Organization (Safe Management of Wastes from Health Care Activities and National Health Care Waste Management Guidelines, 2002).

Table 8. 9 : Seggregation of wastes on Private Hospitals

Area	Does the hospital seggregate wastes?		Total
	Yes	No	
Nepal	**294**	**7**	**301**
Development Region			
Eastern DR	67	1	68
Central DR	138	5	143
Western DR	59	0	59
Mid western WDR	20	1	21
Far Western DR	10	0	10
Ecological Belt			
Mountain	9	0	9
Hill	147	1	148
Terai	138	6	144
In and Out of Valley			
Kathmandu Valley	67	0	67
Out of Kathmandu Valley	227	7	234

Source: Census of Private Hospitals in Nepal 2013,CBS

Table 8.10 : Place of Private Hospital Waste Segregation

Place of Hospital Waste Segregation	Responses percent
Operation Room	23.0%
Ward room	28.4%
Laboratory	26.9%
kitchen	9.8%
Other	11.8%
Total	**100.0%**

Source: Census of Private Hospitals in Nepal 2013,CBS

Table 8.11 : Categories of hospital wastes segregated

Type of Wastes segregated	Response Percent
Sharp waste	20.1%
Pathological waste	18.0%
Infectious waste	18.1%
Radioactive waste	7.2%
Chemical waste	12.5%
Medicinal waste	18.5%
Other waste	5.5%
Total	**100.0%**

Source: Census of Private Hospitals in Nepal 2013,CBS

Table 8.12 : Final disposal locations/places of hospital waste products

Final Disposal Location	ResponsesPercent
Municipality/VDC Collection Centers	30.1%
Lansfill Site	9.1%
Hospital Compound	16.8%
Burning in Incineration	23.2%
Burining Open	13.3%
Other kind of Disposal	7.5%
TOTAL	**100.0%**

Source: Census of Private Hospitals in Nepal 2013,CBS

Table 8.13 : Number of Staff for Hospital Waste Product Management

Area	No of Staff
Nepal	1004
Hospital Type	
Private	701
Community	172
Other	131
Bed Category	
Upto 15 Beds	202
16 to 50 Beds	210
51 to 100 Beds	344
100 Beds and Above	248

Source: Census of Private Hospitals in Nepal 2013,CBS

Chapter IX

Human Settlements

Table 9.1 : Areas and Population by Ecological Belt, Development Region and Place of Residence, Nepal, 2011

Area	Area (sq.km.)	Area (%)	Number of District	Population 2011			Population (%)	Sex Ratio (males per 100 females)	Population Density (persons / sq. km.)
				Total	Male	Female			
Nepal	147181	100.0	75	**26,494,504**	**12,849,041**	**13,645,463**	100.00	94.2	180
Ecological Belt									
Mountain	51817	35.2	16	1,781,792	862,592	919,200	6.73	93.8	34
Hill	61345	41.7	39	11,394,007	5,440,067	5,953,940	43.01	91.4	186
Tarai	34019	23.1	20	13,318,705	6,546,382	6,772,323	50.27	96.7	392
Development Region									
Eastern	28456	19.3	16	5,811,555	2,790,483	3,021,072	21.93	92.4	204
Central	27410	18.6	19	9,656,985	4,841,624	4,815,361	36.45	100.5	352
Western	29398	20.0	16	4,926,765	2,292,597	2,634,168	18.60	87.0	168
Mid -western	42378	28.8	15	3,546,682	1,706,450	1,840,232	13.39	92.7	84
Far- western	19539	13.3	9	2,552,517	1,217,887	1,334,630	9.63	91.3	131
Place of Residence									
Urban	3276	2.2	-	4,523,820	2,306,049	2,217,771	17.07	104.0	1381
Rural	143905	97.8	-	21,970,684	10,542,992	11,427,692	82.93	92.3	153

Source :Central Bureau of Statistics

Table 9.2 : Population Size, Growth Rate and Doubling Time, 1911 – 2011

Census year	Total Population	Population Change	Annual Growth Rate (Exponential)	Doubling Time
1911	5,638,749		-	-
1920	5,573,788	-64,961	-0.13	-
1930	5,532,574	41,214	-0.07	-
1941	6,283,649	7,51,075	1.16	60
1952-54	8,256,625	19,72,976	2.27	31
1961	9,412,996	11,56,371	1.64	42
1971	11,555,983	21,42,987	2.05	34
1981	15,022,839	34,66,856	2.62	26
1991	18,491,097	34,68,258	2.08	33
2001	23,151,423	46,60,326	2.25	31
2011	26,494,504	3,343,081	1.35	52

Source :Central Bureau of Statistics

Table 9.3 : Population Growth Rates by Ecological Belt, Nepal, 1961-2011

	Average Annual Growth Rate of Population 1961-2011			
	Mountain	Hill	Terai	Total
1961-1971	-	-	2.39	2.05
1971-1981	1.35	1.65	4.11	2.62
1981-1991	1.02	1.61	2.75	2.08
1991-2001	1.57	1.97	2.62	2.25
2001-2011	0.54	1.06	1.72	1.35

Source : Central Bureau of Statistics

Table 9.4 : Area and Population Density by Ecological Belt & Development Region, Nepal, 1981-2011

Eco-Belt /Regions		Eastern	Central	Western	Mid Western	Far Western	Total
Mountain	Area sq. km	10438	6277	5819	21351	7932	51817
Population Density (Persons/sq.km.)	1981	32	66	3	11	36	25
	1991	34	75	3	12	42	28
	2001	38	88	4	14	50	33
	2011	38	82	3	18	58	34
Hill	Area sq. km	10749	11805	18319	13710	6762	61345
Population Density (Persons/sq.km.)	1981	117	179	117	76	89	117
	1991	133	227	132	89	99	137
	2001	153	300	152	107	118	167
	2011	149	375	153	123	128	186
Terai	Area sq. km	7269	9328	5260	7317	4845	34019
Population Density (Persons/sq.km.)	1981	291	256	182	92	88	193
	1991	366	325	253	127	140	254
	2001	454	422	333	168	205	330
	2011	525	505	398	201	253	392
Nepal	Area sq.km.	28456	27410	29398	42378	19539	147181
Population Density (Persons/sq.km.)	1981	130	179	106	46	68	102
	1991	156	226	128	57	86	126
	2001	188	293	155	71	112	157
	2011	204	352	168	84	131	180

Source : Central Bureau of Statistics (Population Census:1981,1991,2001 and 2011)

Table 9.5 : Households by types of Ownership of House/housing unit in used, Nepal, 2011

Area		Total	Ownership of house/housing unit(%)			
			Owned	Rented	Institutional	Others
Nepal		**5,423,297**	**85.3**	**12.8**	**0.6**	**1.3**
Urban/Rural						
	Urban	1,045,575	56.8	40.2	1.7	1.3
	Rural	4,377,722	92.1	6.3	0.4	1.3
Ecological Belt						
	Mountain	363,698	92.3	5.6	0.6	1.5
	Hill	2,532,041	78.8	19.3	0.6	1.2
	Terai	2,527,558	90.7	7.3	0.6	1.4
Development Region						
	Eastern Dev. Region	1,230,743	89.1	8.2	0.8	1.9
	Central Dev. Region	1,962,238	77.8	20.4	0.7	1.2
	Western Dev. Region	1,065,599	85.4	12.7	0.6	1.3
	Mid-Western Dev. Region	695,014	93.0	5.8	0.4	0.8
	Far-Western Dev. Region	469,703	94.7	3.9	0.4	1.0

Source : Central Bureau of Statistics, Population Census,2011

Table 9.6 : Percentage distribution of Households by types of House, Nepal, 1991-2001

Year	Area	Total Households	Households by types of House(%)			
			Permanent (Pakki)	Semi-permanent (Ardha-Pakki)	Impermanent (Kachchi)	Others
1991	**Nepal**	3328721	23.5	24.8	49.7	2.0
	Ecological Belt					
	Mountain	274135	32.4	47.3	19.2	1.1
	Hill	1558493	34.7	33.1	31	1.2
	Tarai	1496093	10.4	12.2	75.2	2.2
	Development Region					
	Eastern	821762	6.3	25.1	65.4	3.2
	Central	1115428	26.9	17.9	53.6	1.6
	Western	690160	31.7	26.8	39.4	2.1
	Mid-western	415846	17	40.8	41	1.2
	Far-western	285525	49.3	23	26.9	0.8
2001	**Nepal**	4174374	36.6	29.2	33.5	0.7
	Ecological Belt					
	Mountain	285213	44.8	41.6	13	0.6
	Hill	1951191	51.1	30.8	17.6	0.5
	Tarai	1937970	20.8	25.7	52.4	1
	Development Region					
	Eastern	1000358	14.3	33	51.7	1
	Central	1465753	41.8	26.9	30.6	0.7
	Western	863045	52.3	26	21.1	0.6
	Mid-western	479817	27	38.4	34	0.6
	Far-western	365401	52.5	23.7	23.2	0.6
	Place of Residence					
	Urban	664507	68.2	16.1	15.2	0.4
	Rural	3509867	30.6	31.7	36.9	0.8

Source : Central Bureau of Statistics, Population Census,1991 and 2001: National Report and Selected Urban Tables)

Table 9.7 : Percentage distribution of Households by foundation of house/housing unit,Nepal, 2011

		Total	Type of foundation of house					Not stated
			Mud bonded bricks/ stone	Cement bonded bricks/ stone	RCC with pillar	Wooden pillar	Others	
Nepal		**5423297**	**44.2**	**17.6**	**9.9**	**24.9**	**2.3**	**1.1**
Urban/Rural								
	Urban	1045575	22.0	38.2	28.4	8.5	1.0	1.8
	Rural	4377722	49.5	12.6	5.5	28.8	2.6	0.9
Ecological Belt								
	Mountain	363698	92.8	2.2	0.8	3.2	0.3	0.7
	Hill	2532041	64.8	13.6	12.8	7.4	0.3	1.1
	Terai	2527558	16.6	23.8	8.4	45.5	4.7	1.1
Development Region								
	Eastern Dev. Region	1230743	28.8	15.2	8.0	41.2	5.9	0.8
	Central Dev. Region	1962238	32.6	23.3	15.3	26.5	0.8	1.6
	Western Dev. Region	1065599	59.4	19.2	10.5	8.9	1.2	0.8
	Mid-Western Dev. Region	695014	72.3	6.6	3.4	13.6	3.3	0.7
	Far-Western Dev. Region	469703	56.8	12.5	1.2	28.4	0.3	0.8

Source : Population Census, 2011

Table 9.8 : Households by outer wall of house/housing unit, Nepal, 2011.

Area		Total	Type of outer wall						Not stated
			Mud bonded bricks/ stone	Cement bonded bricks/ stone	Wood/ planks	Bamboo	Unbaked brick	Others	
Nepal		**5,423,297**	**41.38**	**28.74**	**5.31**	**20.23**	**1.13**	**2.08**	**1.13**
Urban/Rural									
	Urban	1,045,575	17.46	69.41	2.44	7.12	0.66	1.02	1.90
	Rural	4,377,722	47.09	19.03	5.99	23.36	1.24	2.33	0.95
Ecological Belt									
	Mountain	363,698	89.49	4.58	1.48	2.96	0.22	0.46	0.81
	Hill	2,532,041	62.41	28.78	3.45	3.48	0.35	0.41	1.12
	Terai	2,527,558	13.39	32.18	7.72	39.49	2.05	3.98	1.19
Development Region									
	Eastern Dev. Region	1,230,743	26.79	21.76	6.51	42.91	0.20	0.95	0.88
	Central Dev. Region	1,962,238	30.38	39.98	4.06	22.53	0.50	0.89	1.65
	Western Dev. Region	1,065,599	56.69	32.65	2.26	4.31	0.63	2.64	0.81
	Mid-Western Dev. Region	695,014	66.18	11.93	4.37	5.29	5.80	5.63	0.80
	Far-Western Dev. Region	469,703	54.12	16.10	15.66	9.37	0.43	3.45	0.87

Source : Population Census, 2011

Table 9.9 : Percentage Distribution of Households by year of construction of house/housing unit, Nepal, 2011

Area		Total	Year of construction								
			Below 5 years	6-10 years	11-20 years	21-50 years	51-100 years	101-150 years	151-500 years	More than 500 years	Not stated
Nepal		5,423,297	21.23	21.69	26.54	17.30	2.94	0.19	0.16	0.02	9.92
Urban/Rural											
	Urban	1,045,575	20.77	22.39	26.73	16.98	3.04	0.23	0.20	0.03	9.64
	Rural	4,377,722	21.34	21.52	26.49	17.38	2.92	0.18	0.16	0.02	9.99
Ecological Belt											
	Mountain	363,698	16.70	17.85	28.73	23.76	5.15	0.38	0.27	0.03	7.12
	Hill	2,532,041	17.66	19.10	27.65	22.99	4.59	0.26	0.20	0.03	7.53
	Terai	2,527,558	25.46	24.84	25.11	10.68	0.97	0.08	0.11	0.01	12.72
Development Region											
	Eastern Dev. Region	1,230,743	24.09	22.62	25.70	15.46	2.61	0.16	0.15	0.02	9.20
	Central Dev. Region	1,962,238	18.44	21.59	26.98	16.70	2.94	0.18	0.17	0.03	12.97
	Western Dev. Region	1,065,599	18.16	19.59	27.86	22.37	3.83	0.22	0.18	0.03	7.77
	Mid-Western Dev. Region	695,014	25.10	23.40	27.08	15.43	1.87	0.16	0.14	0.01	6.80
	Far-Western Dev. Region	469,703	26.65	21.92	23.08	15.98	3.36	0.23	0.17	0.03	8.58

Source: Population Census, 2011

Table 9.10 : Percentage Distribution of Households by roof of house/housing unit Nepal, 2011

Area		Total	Roof of the house (%)							
			Thatch/ straw	Galvanized iron	Tile/ slate	RCC	Wood / planks	Mud	Others	Not stated
Nepal		**5,423,297**	**19.03**	**28.26**	**26.68**	**22.48**	**0.81**	**1.09**	**0.42**	**1.22**
Urban/Rural										
	Urban	1,045,575	3.57	25.20	8.72	59.79	0.30	0.02	0.30	2.09
	Rural	4,377,722	22.73	28.99	30.97	13.57	0.94	1.34	0.45	1.02
Ecological Belt										
	Mountain	363,698	20.38	24.87	32.94	2.36	4.23	12.99	1.35	0.88
	Hill	2,532,041	19.01	31.64	22.14	24.67	0.55	0.47	0.32	1.21
	Terai	2,527,558	18.87	25.37	30.33	23.18	0.59	0.00	0.38	1.29
Development Region										
	Eastern Dev. Region	1,230,743	33.19	44.04	8.55	11.51	1.02	0.02	0.76	0.91
	Central Dev. Region	1,962,238	10.00	22.62	31.52	32.93	0.89	0.01	0.24	1.80
	Western Dev. Region	1,065,599	13.68	37.18	18.72	28.38	0.57	0.34	0.25	0.87
	Mid-Western Dev. Region	695,014	31.58	15.67	31.75	11.31	0.82	7.56	0.46	0.85
	Far-Western Dev. Region	469,703	13.29	8.91	64.55	10.69	0.48	0.50	0.59	0.99

Source: Population Census, 2011

Table 9.11 : Percentage Distribution of Households by number of floor of house/housing unit, Nepal, 2011

Area		Total	No. of floor					
			1 Floor	2 Floor	3 Floor	4 - 5 Floor	6 - 7 Floor	8 Floor & above
Nepal		**5,423,297**	**44.02**	**37.00**	**15.21**	**3.54**	**0.21**	**0.02**
Urban/Rural								
	Urban	1,045,575	37.91	28.32	19.27	13.44	0.97	0.10
	Rural	4,377,722	45.48	39.08	14.24	1.17	0.02	0.00
Ecological Belt								
	Mountain	363,698	10.61	47.50	40.78	1.10	0.02	0.00
	Hill	2,532,041	19.14	48.58	24.91	6.89	0.42	0.04
	Terai	2,527,558	73.75	23.89	1.82	0.52	0.02	0.00
Development Region								
	Eastern Dev. Region	1,230,743	57.04	32.42	9.83	0.69	0.02	0.00
	Central Dev. Region	1,962,238	39.33	32.94	18.58	8.54	0.55	0.06
	Western Dev. Region	1,065,599	42.99	44.13	11.81	1.05	0.02	0.00
	Mid-Western Dev. Region	695,014	41.16	40.30	18.12	0.41	0.01	0.00
	Far-Western Dev. Region	469,703	36.05	44.95	18.63	0.36	0.00	0.00

Source: Population Census, 2011

Table 9.12 : Households by Type of Lighting facilities, Nepal, 2011

Area		Total	Usual source of lighting(%)					
			Electricity	Kerosene	Bio-gas	Solar	Others	Not stated
Nepal		**5,423,297**	**67.3**	**18.3**	**0.3**	**7.4**	**6.1**	**0.6**
Urban/Rural								
	Urban	1,045,575	94.1	4.0	0.4	0.2	0.5	0.8
	Rural	4,377,722	60.8	21.7	0.3	9.2	7.4	0.6
Ecological Belt								
	Mountain	363,698	49.2	14.0	0.2	20.8	15.2	0.5
	Hill	2,532,041	67.3	11.9	0.3	11.0	9.0	0.5
	Terai	2,527,558	69.8	25.3	0.3	2.0	1.8	0.8
Development Region								
	Eastern Dev. Region	1,230,743	63.6	25.8	0.4	7.3	2.4	0.6
	Central Dev. Region	1,962,238	77.1	17.4	0.2	3.2	1.2	0.9
	Western Dev. Region	1,065,599	78.0	15.0	0.2	4.5	1.7	0.5
	Mid-Western Dev. Region	695,014	42.3	13.8	0.2	20.0	23.2	0.5
	Far-Western Dev. Region	469,703	48.1	16.4	0.4	13.7	20.7	0.6

Source : Central Bureau of Statistics,Population Census 2011

Table 9.13 : Households by Type of Main Fuel Used for Cooking, Nepal, 2011

Area		Total	Usual type of fuel used for cooking(%)							
			Wood / firewood	Kerosene	LP gas	Cow dung	Bio gas	Electricity	Others	Not stated
Nepal		**5,423,297**	**64.0**	**1.0**	**21.0**	**10.4**	**2.4**	**0.1**	**0.4**	**0.6**
Urban/Rural										
	Urban	1,045,575	25.7	2.0	67.7	1.5	1.8	0.1	0.4	0.8
	Rural	4,377,722	73.1	0.8	9.9	12.5	2.6	0.1	0.4	0.6
Ecological Belt										
	Mountain	363,698	94.8	0.5	3.1	0.4	0.2	0.3	0.1	0.5
	Hill	2,532,041	67.0	1.1	29.4	0.1	1.6	0.1	0.2	0.5
	Terai	2,527,558	56.5	1.0	15.2	22.1	3.5	0.0	0.7	0.8
Development Region										
	Eastern Dev. Region	1,230,743	60.9	1.0	13.6	20.7	2.6	0.1	0.6	0.6
	Central Dev. Region	1,962,238	50.3	1.6	33.9	11.0	1.6	0.1	0.6	0.9
	Western Dev. Region	1,065,599	65.4	0.7	22.0	7.6	3.6	0.1	0.2	0.5
	Mid-Western Dev. Region	695,014	87.8	0.4	7.7	1.5	2.0	0.0	0.1	0.5
	Far-Western Dev. Region	469,703	91.1	0.5	4.1	0.2	3.3	0.0	0.2	0.6

Source : Central Bureau of Statistics,Population Census 2011

Table 9.14 : Distribution of House, Household and Average Household size, Nepal, 2011

Area	Population 2011	Number of House	Number of Household	Average household Size	Average household per house	Average person per house
Nepal	**26,494,504**	**4,462,957**	**5,423,297**	**4.88**	**1.22**	**5.94**
Ecological Belt						
Mountain	1,781,792	320108	363698	4.89	1.14	5.57
Hill	11,394,007	1994283	2532041	4.50	1.27	5.71
Terai	13,318,705	2148566	2527558	5.27	1.18	6.20
Development Region						
Eastern	5,811,555	1073009	1230743	4.72	1.15	5.42
Central	9,656,985	1465727	1962238	4.92	1.34	6.59
Western	4,926,765	902635	1065599	4.62	1.18	5.46
Mid-western	3,546,682	620283	695014	5.10	1.12	5.72
Far-western	2,552,517	401303	469703	5.43	1.17	6.36

Source: Central Bureau of Statistics (Population Census 2011)

Table 9.15 : Percentage Distribution of House having Number of Households Residing in the house, Nepal, 2001

Area	Total House	Percentage of House having number of Household		
		1	2-3	4+
Nepal	**3,598,212**	**90.17**	**8.48**	**1.35**
Ecological Belt				
Mountain	253,006	90.54	8.82	0.64
Hill	1,667,410	90.28	8.17	1.55
Tarai	1,677,796	90.02	8.73	1.25
Development Region				
Eastern	898,616	92.74	6.36	0.91
Central	1,175,867	86.65	10.86	2.49
Western	776,788	92.39	6.85	0.76
Mid-western	439,906	93.36	6.13	0.51
Far-western	307,035	85.99	13.04	0.97
Place of Residence				
Urban	436,533	75.14	18.68	6.18
Rural	3,161,679	92.25	7.07	0.68

Source : Central Bureau of Statistics (2003), Special Tabulation National Population Census, 2001.

Table 9.16 : Population, Households and Population Density of District in Nepal, 2011

S.N.	District	Population 2011			Annual Growth Rate(%)	Sex Ratio (males per 100 females)	Number of Household	Average Household Size	Area in Sq.km.	Population Density (persons / sq.km.)
		Total	Male	Female						
1	Taplejung	127,461	60,552	66,909	-0.55	90	26,509	4.81	3,646	35
2	Panchthar	191,817	90,186	101,631	-0.52	89	41,196	4.66	1,241	155
3	Ilam	290,254	141,126	149,128	0.26	95	64,502	4.50	1,703	170
4	Jhapa	812,650	385,096	427,554	1.66	90	184,552	4.40	1,606	506
5	Morang	965,370	466,712	498,658	1.35	94	213,997	4.51	1,855	520
6	Sunsari	763,487	371,229	392,258	1.99	95	162,407	4.70	1257	607
7	Dhankuta	163,412	76,515	86,897	-0.19	88	37,637	4.34	891	183
8	Terhathum	101,577	47,151	54,426	-1.08	87	22,094	4.60	679	150
9	Sankhuwasabha	158,742	75,225	83,517	-0.03	90	34,624	4.58	3,480	46
10	Bhojpur	182,459	86,053	96,406	-1.07	89	39,419	4.63	1,507	121
11	Solukhumbu	105,886	51,200	54,686	-0.17	94	23,785	4.45	3,312	32
12	Okhaldhunga	147,984	68,687	79,297	-0.57	87	32,502	4.55	1,074	138
13	Khotang	206,312	97,092	109,220	-1.15	89	42,664	4.84	1,591	130
14	Udayapur	317,532	149,712	167,820	0.99	89	66,557	4.77	2,063	154
15	Saptari	639,284	313,846	325,438	1.14	96	121,098	5.28	1,363	469
16	Siraha	637,328	310,101	327,227	1.07	95	117,962	5.40	1,188	536
17	Dhanusa	754,777	378,538	376,239	1.17	101	138,249	5.46	1,180	640
18	Mahottari	627,580	311,016	316,564	1.26	98	111,316	5.64	1,002	626
19	Sarlahi	769,729	389,756	379,973	1.91	103	132,844	5.79	1,259	611
20	Sindhuli	296,192	142,123	154,069	0.57	92	57,581	5.14	2,491	119
21	Ramechhap	202,646	93,386	109,260	-0.47	85	43,910	4.62	1,546	131
22	Dolakha	186,557	87,003	99,554	-0.91	87	45,688	4.08	2,191	85
23	Sindhupalchok	287,798	138,351	149,447	-0.61	93	66,688	4.32	2542	113
24	Kavrepalanchowk	381,937	182,936	199,001	-0.10	92	80,720	4.73	1396	274
25	Lalitpur	468,132	238,082	230,050	3.26	103	109,797	4.26	385	1216
26	Bhaktapur	304,651	154,884	149,767	3.01	103	68,636	4.44	119	2560
27	Kathmandu	1,744,240	913,001	831,239	4.78	110	436,344	4.00	395	4416
28	Nuwakot	277,471	132,787	144,684	-0.39	92	59,215	4.69	1,121	248
29	Rasuwa	43,300	21,475	21,825	-0.33	98	9,778	4.43	1,544	28
30	Dhading	336,067	157,834	178,233	-0.08	89	73,851	4.55	1,926	174
31	Makwanpur	420,477	206,684	213,793	0.69	97	86,127	4.88	2,426	173
32	Rautahat	686,722	351,079	335,643	2.31	105	106,668	6.44	1,126	610
33	Bara	687,708	351,244	336,464	2.07	104	108,635	6.33	1,190	578
34	Parsa	601,017	312,358	288,659	1.90	108	95,536	6.29	1,353	444
35	Chitawan	579,984	279,087	300,897	2.06	93	132,462	4.38	2,218	261
36	Gorkha	271,061	121,041	150,020	-0.61	81	66,506	4.08	3,610	75
37	Lamjung	167,724	75,913	91,811	-0.55	83	42,079	3.99	1,692	99
38	Tanahu	323,288	143,410	179,878	0.25	80	78,309	4.13	1,546	209
39	Syangja	289,148	125,833	163,315	-0.93	77	68,881	4.20	1,164	248
40	Kaski	492,098	236,385	255,713	2.57	92	125,673	3.92	2,017	244
41	Manang	6,538	3,661	2,877	-3.83	127	1,480	4.42	2,246	3
42	Mustang	13,452	7,093	6,359	-1.08	112	3,354	4.01	3,573	4
43	Myagdi	113,641	51,395	62,246	-0.07	83	27,762	4.09	2,297	49
44	Parbat	146,590	65,301	81,289	-0.74	80	35,719	4.10	494	297
45	Baglung	268,613	117,997	150,616	-0.01	78	61,522	4.37	1,784	151
46	Gulmi	280,160	120,995	159,165	-0.57	76	64,921	4.32	1,149	244
47	Palpa	261,180	115,840	145,340	-0.28	80	59,291	4.41	1,373	190
48	Nawalparasi	643,508	303,675	339,833	1.34	89	128,793	5.00	2,162	298
49	Rupandehi	880,196	432,193	448,003	2.17	96	163,916	5.37	1,360	647
50	Kapilbastu	571,936	285,599	286,337	1.71	100	91,321	6.26	1,738	329

Table 9.16 : Population, Households and Population Density of District in Nepal, 2011

(contd...)

S.N.	District	Population 2011			Annual Growth Rate(%)	Sex Ratio (males per 100 females)	Number of Household	Average Household Size	Area in Sq.km.	Population Density (persons / sq.km.)
		Total	Male	Female						
51	Arghakhanchi	197,632	86,266	111,366	-0.53	77	46,835	4.22	1,193	166
52	Pyuthan	228,102	100,053	128,049	0.71	78	47,730	4.78	1,309	174
53	Rolpa	224,506	103,100	121,406	0.67	85	43,757	5.13	1,879	119
54	Rukum	208,567	99,159	109,408	1.01	91	41,856	4.98	2,877	72
55	Salyan	242,444	115,969	126,475	1.27	92	46,556	5.21	1,462	166
56	Dang	552,583	261,059	291,524	1.78	90	116,415	4.75	2,955	187
57	Banke	491,313	244,255	247,058	2.42	99	94,773	5.18	2,337	210
58	Bardiya	426,576	205,080	221,496	1.09	93	83,176	5.13	2,025	211
59	Surkhet	350,804	169,421	181,383	1.95	93	72,863	4.81	2,451	143
60	Dailekh	261,770	126,990	134,780	1.50	94	48,919	5.35	1,502	174
61	Jajarkot	171,304	85,537	85,767	2.39	100	30,472	5.62	2,230	77
62	Dolpa	36,700	18,238	18,462	2.17	99	7,488	4.90	7,889	5
63	Jumla	108,921	54,898	54,023	1.97	102	19,303	5.64	2,531	43
64	Kalikot	136,948	68,833	68,115	2.60	101	23,013	5.95	1,741	79
65	Mugu	55,286	28,025	27,261	2.30	103	9,619	5.75	3,535	16
66	Humla	50,858	25,833	25,025	2.25	103	9,479	5.37	5,655	9
67	Bajura	134,912	65,806	69,106	2.15	95	24,908	5.42	2,188	62
68	Bajhang	195,159	92,794	102,365	1.56	91	33,786	5.78	3,422	57
69	Achham	257,477	120,008	137,469	1.07	87	48,351	5.33	1,680	153
70	Doti	211,746	97,252	114,494	0.22	85	41,440	5.11	2,025	105
71	Kailali	775,709	378,417	397,292	2.29	95	142,480	5.44	3,235	240
72	Kanchanpur	451,248	216,042	235,206	1.77	92	82,152	5.49	1,610	280
73	Dadeldhura	142,094	66,556	75,538	1.19	88	27,045	5.25	1,538	92
74	Baitadi	250,898	117,407	133,491	0.68	88	45,191	5.55	1,519	165
75	Darchaula	133,274	63,605	69,669	0.88	91	24,618	5.41	2,322	57
	Nepal	**26,494,504**	**12,849,041**	**13,645,463**	**1.35**	**94**	**5,427,302**	**4.88**	**147,181**	**180**

Source: Central Bureau of Statistics,Population Census 2011

Table 9.17 : Area and Urban Population and Density by Municipality, 2011

S.N.	Municipality	Household	Population			Growth Rate	Area in Sq. Km.	Average Household Size	Sex Ratio	Population Density
			Total	Male	Female					
1	Ilam Municipality	4,740	19,427	9,674	9,753	1.79	26.63	4.10	99.19	729.52
2	Bhadrapur Municipality	4,260	18,646	9,324	9,322	0.27	10.56	4.38	100.02	1,765.72
3	Damak Municipality	18,123	75,743	35,824	39,919	7.72	70.63	4.18	89.74	1,072.39
4	Mechinagar Municipality	13,196	57,909	27,856	30,053	1.66	55.72	4.39	92.69	1,039.29
5	Biratnagar Sub-Metropolitan City	45,228	204,949	104,935	100,014	2.07	58.48	4.53	104.92	3,504.60
6	Dharan Municipality	27,796	119,915	57,562	62,353	2.29	103.38	4.31	92.32	1,159.94
7	Inaruwa Municipality	6,199	28,923	14,638	14,285	2.20	22.36	4.67	102.47	1,293.52
8	Itahari Municipality	18,306	76,869	37,606	39,263	6.23	42.37	4.20	95.78	1,814.23
9	Dhankuta Municipality	7,220	28,364	14,199	14,165	3.17	48.21	3.93	100.24	588.34
10	Khandbari Municipality	6,295	26,658	12,826	13,832	2.02	91.03	4.23	92.73	292.85
11	Triyuga Municipality	15,938	71,405	34,284	37,121	2.56	319.88	4.48	92.36	223.22
12	Rajbiraj Municipality	7,751	38,241	20,044	18,197	2.31	11.96	4.93	110.15	3,197.41
13	Lahan Municipality	6,483	33,927	17,536	16,391	2.04	20.23	5.23	106.99	1,677.06
14	Siraha Municipality	5,404	28,831	14,226	14,605	1.84	23.78	5.34	97.40	1,212.41
15	Janakpur Municipality	19,195	98,446	52,481	45,965	2.83	24.61	5.13	114.18	4,000.24
16	Jaleshwor Municipality	4,208	24,765	12,888	11,877	1.16	15.49	5.89	108.51	1,598.77
17	Malangawa Municipality	4,464	25,143	12,988	12,155	3.08	9.39	5.63	106.85	2,677.64
18	Kamalamai Municipality	9,320	41,117	20,360	20,757	2.25	207.95	4.41	98.09	197.73
19	Bhimeshwor Municipality	6,092	23,337	11,238	12,099	0.63	65.04	3.83	92.88	358.81
20	Banepa Municipality	5,546	24,894	12,446	12,448	4.53	5.56	4.49	99.98	4,477.34
21	Dhulikhel Municipality	3,291	16,263	8,392	7,871	3.45	12.08	4.94	106.62	1,346.27
22	Panauti Municipality	5,956	28,312	13,768	14,544	1.02	31.73	4.75	94.66	892.28
23	Lalitpur Sub-metropolitan city	54,748	226,728	117,932	108,796	3.30	15.15	4.14	108.40	14,965.54
24	Bhaktapur Municipality	17,655	83,658	42,678	40,980	1.43	6.56	4.74	104.14	12,752.74
25	Madhyapur Thimi Municipality	20,337	84,142	43,510	40,632	5.67	11.11	4.14	107.08	7,573.54
26	Kathmandu Metropolitan City	254,764	1,003,285	533,127	470,158	4.01	49.45	3.94	113.39	20,288.88
27	Kirtipur Municipality	19,464	67,171	37,485	29,686	4.98	14.76	3.45	126.27	4,550.88
28	Bidur Municipality	6,279	27,953	13,608	14,345	2.77	33.48	4.45	94.86	834.92
29	Hetauda Municipality	19,890	85,653	42,981	42,672	2.24	47.77	4.31	100.72	1,793.03
30	Gaur Municipality	5,639	35,370	18,697	16,673	3.32	21.53	6.27	112.14	1,642.82
31	Kalaiya Municipality	6,852	43,137	22,686	20,451	2.91	18.98	6.30	110.93	2,272.76
32	Birgunj Sub-Metropolitan City	24,180	139,068	75,382	63,686	2.12	21.17	5.75	118.37	6,569.11
33	Bharatpur Municipality	36,987	147,777	74,205	73,572	5.03	162.16	4.00	100.86	911.30
34	Ratnanagar Municipality	10,861	46,607	22,373	24,234	2.10	35.62	4.29	92.32	1,308.45
35	Gorkha Municipality	8,810	33,865	15,895	17,970	2.73	60.28	3.84	88.45	561.79
36	Byas Municipality	11,326	43,615	20,005	23,610	4.34	60.02	3.85	84.73	726.67
37	Putalibazar Municipality	8,190	31,338	14,122	17,216	0.55	70.14	3.83	82.03	446.79
38	Waling Municipality	5,959	24,199	10,987	13,212	1.70	34.76	4.06	83.16	696.17
39	Lekhnath Municipality	14,958	59,498	27,394	32,104	3.63	77.45	3.98	85.33	768.21
40	Pokhara Sub-Metropolitan City	68,398	264,991	133,318	131,673	5.28	55.22	3.87	101.25	4,798.82
41	Baglung Municipality	7,859	30,763	14,710	16,053	3.89	18.35	3.91	91.63	1,676.46
42	Tansen Municipality	8,433	31,161	15,332	15,829	4.22	21.72	3.70	96.86	1,434.67
43	Ramgram Municipality	4,982	28,973	15,505	13,468	2.47	34.72	5.82	115.12	834.48
44	Butwal Municipality	29,687	120,982	60,870	60,112	4.73	69.28	4.08	101.26	1,746.28
45	Siddharthanagar Municipality	12,513	64,566	32,671	31,895	2.06	36.03	5.16	102.43	1,792.01
46	Kapilvastu Municipality	5,136	30,890	15,654	15,236	1.28	37.20	6.01	102.74	830.38
47	Ghorahi Municipality	15,517	65,107	32,149	32,958	4.12	74.45	4.20	97.55	874.51
48	Tulsipur Municipality	12,223	52,224	25,293	26,931	4.33	92.22	4.27	93.92	566.30
49	Nepalgunj Municipality	15,200	73,779	38,113	35,666	2.49	12.51	4.85	106.86	5,897.60
50	Gulariya Municipality	11,230	57,232	29,399	27,833	2.18	95.14	5.10	105.63	601.56
51	Birendranagar Municipality	12,045	52,137	27,221	24,916	5.08	34.95	4.33	109.25	1,491.76
52	Narayan Municipality	4,681	21,995	10,733	11,262	1.23	67.01	4.70	95.30	328.23
53	Dipayal Silgadhi Municipality	5,509	26,508	13,686	12,822	1.84	73.98	4.81	106.74	358.31
54	Dhangadhi Municipality	21,059	104,047	53,237	50,810	4.34	103.73	4.94	104.78	1,003.06
55	Tikapur Municipality	11,639	56,983	27,640	29,343	3.86	67.11	4.90	94.20	849.10
56	Bhimdatta Municipality	20,695	106,666	53,098	53,568	2.77	171.24	5.15	99.12	622.90
57	Amargadhi Municipality	4,786	22,241	10,963	11,278	1.90	138.95	4.65	97.21	160.06
58	Dasharathchanda Municipality	3,795	17,427	8,295	9,132	-0.51	55.01	4.59	90.83	316.80

Source: Central Bureau of Statistics,Population Census 2011

Table 9.18 : Distribution of district by size of Population,Nepal,1971-2011

Size of Population	Number of District					Population				
	1971	1981	1991	2001	2011	1971	1981	1991	2001	2011
Less than 10,000	1	1	1	1	1	7,436	7,021	5,363	9,587	6,538
10,000-19,999	3	1	1	1	1	45,644	12,930	14,292	14,981	13,452
20,000-29,999	3	2	1	1	-	82,186	42,346	25,013	29,545	-
30,000-39,000	-	1	3	-	1	-	30,241	107,491	-	36,700
40,000-49,999	-	1	-	3	1	-	43,705	-	129,263	43,300
50,000-59,999	1	-	-	-	2	57,946	-	-	-	106,144
60,000-69,999	3	1	-	-	-	199,073	68,797	-	-	-
70,000-79,999	-	1	1	-	-	-	74,649	75,964	-	-
80,000-89,999	2	3	1	1	-	171,279	262,736	88,805	89,427	-
90,000-99,999	2	4	2	-	-	190,986	378,888	189,210	-	-
100,000-199,999	41	28	25	16	20	5,802,698	4,433,030	3,842,156	2,240,152	3,014,094
200,000-299,999	12	18	20	23	19	2,752,028	4,293,871	5,034,279	5,570,510	4,816,345
300,000-399,999	7	10	6	11	6	2,245,707	3,505,384	2,092,131	3,920,048	2,014,279
400,000-499999	-	3	9	4	6	-	1,334,549	4,006,670	1,913,623	2,749,844
500,000 or more	-	1	5	14	18	-	534,692	3,009,723	9,234,287	13,693,808
	75	**75**	**75**	**75**	**75**	**11,554,983**	**15,022,839**	**18,491,097**	**23,151,423**	**26,494,504**

Source : Central Bureau of Statistics (Population census 1971,1981,1991,2001 and 2011)

Table 9.19 :Distribution of Urban(Municipalities) by size of Population,Nepal,1971- 2011

Size of Population	Number of Urban					Population				
	1971	1981	1991	2001	2011	1971	1981	1991	2001	2011
Less than 20,000	9	7	8	8	4	102638	90573	217901	136390	71,763
20,000-49,999	5	13	14	34	27	149849	457569	293888	1032245	831,127
50,000-99,999	1	2	8	11	17	59049	173419	517419	788937	1,182,522
100,000 - 299,000	1	1	3	5	9	150402	235160	666511	1270307	1,435,123
300000 or more					1					1,003,285
Total	**16**	**23**	**33**	**58**	**58**	**461938**	**956721**	**1695719**	**3227879**	**4,523,820**

Source : Central Bureau of Statistics (Population census 1971,1981,1991,2001 and 2011)

Table 9.20 : Number of Vehicles Registered, 1989/90 - 2012/13

Year	Number of Vehicles Registered										
	Bus	Minibus	Crane/Dozer/Excavator/ Truck	Car/Jeep / Van	Pickup	Micro	Tempo	Motorcycle	Tractor/ Power Tailor	Others	Total
up to 1989/90	4159	2064	8969	24050	-	-	2359	35776	6769	102	84248
1990/91	458	226	800	1893	-	-	856	4954	788	1549	11524
1991/92	413	148	1524	2115	-	-	1207	8154	548	358	14467
1992/93	606	185	1491	2266	-	-	62	7608	262	381	12861
1993/94	1168	77	1740	3049	-	-	154	8653	1396	372	16609
1994/95	850	83	1629	3043	-	-	241	9401	1814	353	17414
1995/96	486	82	1151	5261	-	-	117	13855	2183	58	23193
1996/97	608	175	907	2993	-	-	185	12633	1257	352	19110
1997/98	899	130	1291	4139	-	-	344	12306	1265	51	20425
1998/99	872	19	978	2507	-	-	388	17090	2248	37	24139
1999/00	494	122	829	3647	-	-	789	19755	2542	102	28280
2000/01	1203	250	1271	5152	-	-	232	29291	3519	77	40995
2001/02	868	475	1798	4374	-	-	248	38522	3189	86	49560
2002/03	432	298	1212	2906	581	232	17	29404	2485	43	37610
2003/04	732	237	1477	7079	478	884	16	26547	2191	58	39699
2004/05	753	285	1592	4781	-	584	48	31093	1374	21	40531
2005/06	1528	663	2263	5114	36	66	60	45410	635	-	55775
2006/07	1564	806	3278	5156	736	138	12	72568	2942	1535	88735
2007/08	1419	1179	3594	4741	1588	31	18	69666	3297	206	85739
2008/09	1843	593	3643	6857	1287	128	20	83334	4663	202	102570
2009/10	1888	780	4524	12268	1975	145	9	168707	11460	31	201787
2010/11	1610	1370	1969	8510	3087	115	2	138907	7937	133	163640
2011/12	2085	1170	1333	8711	2981	155	10	145135	8413	91	170084
2012/13	3263	1328	3332	9595	5422	158	57	175381	9795	152	208483
Total	**30201**	**12745**	**52595**	**140207**	**18171**	**2636**	**7451**	**1204150**	**82972**	**6350**	**1557478**

Source : Department of Transport Management.

Table 9.21 :Total Strategic Road Network (SRN) Length ,Influenced Population of District in Nepal, 2011

S.N.	District	Total Population 2011	Total Area in Sq.km.	Type of Road				Population Influenced per km. Road	Road Density (km./100 sq.km.)
				Black Topped	Graveled	Earthen	Total		
1	Taplejung	127,461	3,646	0.00	25.50	7.60	33.10	3851	1
2	Panchthar	191,817	1,241	34.86	57.00	107.00	198.86	965	16
3	Ilam	290,254	1,703	108.75	12.10	127.10	247.95	1171	15
4	Jhapa	812,650	1,606	139.92	39.68	17.00	196.60	4134	12
5	Morang	965,370	1,855	150.52	25.50	40.20	216.22	4465	12
6	Sunsari	763,487	1257	115.03	66.00	10.00	191.03	3997	15
7	Dhankuta	163,412	891	76.68	49.00	9.00	134.68	1213	15
8	Terhathum	101,577	679	8.42	0.00	76.25	84.67	1200	12
9	Sankhuwasabha	158,742	3,480	47.70	25.00	62.00	134.70	1178	4
10	Bhojpur	182,459	1,507	0.00	7.50	108.50	116.00	1573	8
11	Solukhumbu	105,886	3,312	0.00	0.00	37.20	37.20	2846	1
12	Okhaldhunga	147,984	1,074	0.00	8.79	62.91	71.70	2064	7
13	Khotang	206,312	1,591	0.00	0.00	196.76	196.76	1049	12
14	Udayapur	317,532	2,063	90.86	42.00	111.00	243.86	1302	12
15	Saptari	639,284	1,363	135.00	65.50	46.00	246.50	2593	18
16	Siraha	637,328	1,188	111.93	19.00	14.00	144.93	4397	12
17	Dhanusa	754,777	1,180	104.15	47.50	43.50	195.15	3868	17
18	Mahottari	627,580	1,002	99.79	59.00	26.50	185.29	3387	18
19	Sarlahi	769,729	1,259	58.22	85.20	38.00	181.42	4243	14
20	Sindhuli	296,192	2,491	42.50	29.60	129.90	202.00	1466	8
21	Ramechhap	202,646	1,546	2.00	25.70	49.30	77.00	2632	5
22	Dolakha	186,557	2,191	86.68	30.00	20.00	136.68	1365	6
23	Sindhupalchok	287,798	2542	107.31	19.84	69.10	196.25	1466	8
24	Kavrepalanchowk	381,937	1396	111.09	33.73	4.30	149.12	2561	11
25	Lalitpur	468,132	385	61.37	36.04	33.20	130.61	3584	34
26	Bhaktapur	304,651	119	81.50	23.09	7.00	111.59	2730	94
27	Kathmandu	1,744,240	395	149.59	34.10	37.20	220.89	7896	56
28	Nuwakot	277,471	1,121	94.71	21.00	25.00	140.71	1972	13
29	Rasuwa	43,300	1,544	0.00	50.50	15.70	66.20	654	4
30	Dhading	336,067	1,926	114.88	20.00	30.20	165.08	2036	9
31	Makwanpur	420,477	2,426	174.97	44.57	70.20	289.74	1451	12
32	Rautahat	686,722	1,126	71.83	9.00	7.00	87.83	7819	8
33	Bara	687,708	1,190	83.34	68.00	16.00	167.34	4110	14
34	Parsa	601,017	1,353	30.61	13.00	2.00	45.61	13177	3
35	Chitawan	579,984	2,218	136.25	54.00	39.00	229.25	2530	10
36	Gorkha	271,061	3,610	23.84	34.00	119.40	177.24	1529	5
37	Lamjung	167,724	1,692	19.17	1.00	51.87	72.04	2328	4
38	Tanahu	323,288	1,546	118.09	9.32	34.08	161.49	2002	10
39	Syangja	289,148	1,164	97.94	10.00	57.00	164.94	1753	14
40	Kaski	492,098	2,017	87.46	5.00	20.50	112.96	4356	6
41	Manang	6,538	2,246	0.00	0.00	29.00	29.00	225	1
42	Mustang	13,452	3,573	0.00	0.00	59.00	59.00	228	2
43	Myagdi	113,641	2,297	0.00	10.00	21.00	31.00	3666	1
44	Parbat	146,590	494	24.11	0.00	26.50	50.61	2896	10
45	Baglung	268,613	1,784	6.34	5.79	89.00	101.13	2656	6
46	Gulmi	280,160	1,149	44.54	0.00	79.00	123.54	2268	11
47	Palpa	261,180	1,373	108.59	0.00	39.00	147.59	1770	11
48	Nawalparasi	643,508	2,162	151.07	23.80	29.00	203.87	3156	9
49	Rupandehi	880,196	1,360	130.19	19.00	14.50	163.69	5377	12
50	Kapilbastu	571,936	1,738	139.97	54.00	29.00	222.97	2565	13

Table 9.21 :Total Strategic Road Network (SRN) Length ,Influenced Population of District in Nepal, 2011

(contd...)

S.N.	District	Total Population 2011	Total Area in Sq.km.	Type of Road				Population Influenced per km. Road	Road Density (km./100 sq.km.)
				Black Topped	Graveled	Earthen	Total		
51	Arghakhanchi	197,632	1,193	58.91	3.00	84.00	145.91	1354	12
52	Pyuthan	228,102	1,309	68.00	12.00	80.43	160.43	1422	12
53	Rolpa	224,506	1,879	33.40	61.00	94.02	188.42	1192	10
54	Rukum	208,567	2,877	0.00	20.00	38.90	58.90	3541	2
55	Salyan	242,444	1,462	4.00	101.66	70.00	175.66	1380	12
56	Dang	552,583	2,955	148.22	169.00	44.00	361.22	1530	12
57	Banke	491,313	2,337	149.81	42.50	34.10	226.41	2170	10
58	Bardiya	426,576	2,025	121.43	60.99	29.00	211.42	2018	10
59	Surkhet	350,804	2,451	112.14	66.70	56.30	235.14	1492	10
60	Dailekh	261,770	1,502	78.09	37.77	128.37	244.23	1072	16
61	Jajarkot	171,304	2,230	0.00	0.00	89.00	89.00	1925	4
62	Dolpa	36,700	7,889	0.00	0.00	0.00	0.00	0	0
63	Jumla	108,921	2,531	0.00	0.00	85.00	85.00	1281	3
64	Kalikot	136,948	1,741	0.00	0.00	77.00	77.00	1779	4
65	Mugu	55,286	3,535	0.00	0.00	0.00	0.00	0	0
66	Humla	50,858	5,655	0.00	0.00	30.00	30.00	1695	1
67	Bajura	134,912	2,188	0.00	0.00	43.00	43.00	3137	2
68	Bajhang	195,159	3,422	15.60	14.82	48.36	78.78	2477	2
69	Achham	257,477	1,680	42.00	0.00	85.00	127.00	2027	8
70	Doti	211,746	2,025	115.46	6.00	28.00	149.46	1417	7
71	Kailali	775,709	3,235	165.35	61.25	75.00	301.60	2572	9
72	Kanchanpur	451,248	1,610	44.32	89.00	22.10	155.42	2903	10
73	Dadeldhura	142,094	1,538	77.08	0.00	64.00	141.08	1007	9
74	Baitadi	250,898	1,519	136.53	1.10	43.29	180.92	1387	12
75	Darchaula	133,274	2,322	0.00	0.00	75.42	75.42	1767	3
Nepal		**26,494,504**	**147,184**	**4952.11**	**2065.14**	**3817.76**	**10835.01**	**2445**	**7**

Source: Central Bureau of Statistics ,Population Census 2011
Department of Roads (Statistics of Strategic Road Network SSRN 2009/10)

Table 9.22 : Number of Refugees in Nepal

Refugee	Year	Male	Female	Total
Bhutanese Refugee	2006	54486	52261	106747
	2007	55217	52965	108182
	2009	48014	46429	94443
	2010	40987	39526	80513
	2011	34168	32819	66987
	2012	22252	21205	43457
	2013	18175	16993	35168
Tibetan Refugee	12540			

Source : Ministry of Home Affairs.

Table 9.23 : Urban Road by Municipality, 2013

(length in km.)

S.N.	Municipality	Type of Road			Population 2011	Urban Population per km Road
		Black Topped	Graveled	Total		
1	Amargadhi	5.6	5	10.6	22,241	2098
2	Baglung	25.34	13.15	38.49	30,763	799
3	Banepa	22.33	19.44	41.77	24,894	596
4	Bhadrapur	38.18	10.65	48.83	18,646	382
5	Bhaktapur	5.58	3.02	8.6	83,658	9728
6	Bharatpur	182.78	160.36	343.14	147,777	431
7	Bhimdatta	25.15	96.18	121.33	106,666	879
8	Bhimeshwor	36.08	11	47.08	23,337	496
9	Bidur	7.1	10.3	17.4	27,953	1606
10	Biratnagar	148	320	468	204,949	438
11	Birendranagar	19.03	58.9	77.93	52,137	669
12	Birgunj	53.91	80.69	134.6	139,068	1033
13	Butwal	307.63	133.54	441.17	120,982	274
14	Byas	30.47	42.03	72.5	43,615	602
15	Damak	10.65	17.44	28.09	75,743	2696
16	Dasharathchanda	0	0	0	17,427	0
17	Dhangadhi	118.4	193.9	312.3	104,047	333
18	Dhankuta	18.9	3.14	22.04	28,364	1287
19	Dharan	85.33	28.8	114.13	119,915	1051
20	Dhulikhel	8.73	12.56	21.29	16,263	764
21	Dipayal	6.7	1.5	8.2	26,508	3233
22	Gaur	24.41	17.63	42.04	35,370	841
23	Ghorahi	30.5	167	197.5	65,107	330
24	Gorkha	29.78	18.55	48.33	33,865	701
25	Gulariya	23.18	77.49	100.67	57,232	569
26	Hetauda	107.5	112.25	219.75	85,653	390
27	Ilam	8	350	358	19,427	54
28	Inaruwa	28.42	37.94	66.36	28,923	436
29	Itahari	36.75	179.87	216.62	76,869	355
30	Jaleshwor	12.4	11	23.4	24,765	1058
31	Janakpur	70	50	120	98,446	820
32	Kalaiya	17.5	46.57	64.07	43,137	673
33	Kamalami	17	43.2	60.2	41,117	683
34	Kapilvastu	30.68	39.42	70.1	30,890	441
35	Kathmandu	96.1	0.32	96.42	1,003,285	10405
36	Khandbari	1.7	0.5	2.2	26,658	12117
37	Kirtipur	31.4	30.1	61.5	67,171	1092
38	Lahan	20.55	35.16	55.71	33,927	609
39	Lalitpur	57.13	10.75	67.88	226,728	3340
40	Lekhnath	20.1	23.8	43.9	59,498	1355
41	Madhyapur Thimi	1.53	2.26	3.79	84,142	22201
42	Malangawa	7.67	22.4	30.07	25,143	836
43	Mechinagar	20.82	153.48	174.3	57,909	332
44	Narayan	12.86	0	12.86	21,995	1710
45	Nepalgunj	30.84	48.55	79.39	73,779	929
46	Panauti	7.21	8.6	15.81	28,312	1791
47	Pokhara	241.9	0.23	242.13	264,991	1094
48	Putalibazar	15.58	16.91	32.49	31,338	965
49	Rajbiraj	8.55	31.55	40.1	38,241	954
50	Ramgram	9.35	31.06	40.41	28,973	717
51	Ratnanagar	13.65	64.5	78.15	46,607	596
52	Siddharthanagar	48.8	85.13	133.93	64,566	482
53	Siraha	5.8	42.6	48.4	28,831	596
54	Tansen	10.89	1.5	12.39	31,161	2515
55	Tikapur	24.93	132.48	157.41	56,983	362
56	Triyuga	41.27	88.67	129.94	71,405	550
57	Tulsipur	4.8	81	85.8	52,224	609
58	Waling	13.91	2.43	16.34	24,199	1481
	Total			**5625.85**	**4523820**	**804**

Source : Ministry of Local Development and Central Bureau of Statistics (Population Census 2011)

Table 9.24 : Nepal National Building Code, 2003

S. N.	Building Code No.	Contents	Remarks
1	NBC 000	Requirements for State of the Art Design: An Introduction	Building for Foreign Donor Organizations
2	NBC 001	Materials Specifications	> 1000 sq.ft plinth area and more than 3 flats. Building designer and monitoring by Architecture Engineer
3	NBC 002	Unit Weight of Materials	
4	NBC 003	Occupancy Load (Imposed Load)	
5	NBC 004	Wind Load	
6	NBC 005	Seismic Design of Building	
7	NBC 006	Snow Load	
8	NBC 007	Provisional Recommendation on First Safety	
9	NBC 008	Site Consideration for Seismic Hazards	
10	NBC 009	Masonry : Unreinforced	
11	NBC 010	Plain and Reinforced Concrete	
12	NBC 011	Steel	
13	NBC 012	Timber	
14	NBC 013	Aluminum	
15	NBC 014	Construction Safety	
16	NBC 201	Mandatory Rule of Timber : Reinforced Concrete Buildings with Masonry Infill	< 1000 sq. ft plinth area and less than 3 flats. Building designer and monitoring by Architecture Sub-Engineer
17	NBC 202	Mandatory Rule of Timber : Load Bearing Masonry	
18	NBC 203	Guidelines for Earthquake Resident Building Construction : Low Strength Masonry	
19	NBC 204	Guidelines for Earthquake Resident Building Construction : Earthen Building (EB)	
20	NBC 205	Mandatory Rule of Thumb : Reinforced Concrete Buildings without Masonry Infill	
21	NBC 206	Architectural Design Requirements	> 1000 sq.ft plinth area and more than 3 flats. Building designer and monitoring by Architecture Engineer
22	NBC 207	Electrical Design Requirements for (public Buildings)	
23	NBC 208	Sanitary and Plumbing Design Requirements	

Source : Department of Housing and Urban Development.

Chapter X

Natural Disasters

Table 10.1: Earthquake by Epicentre and Magnitude, 2008-2013

Date	Latitude	Longitude	Magnitude (ml)	Epicentre
15-Jan-08	27.37	86.53	4.1	Okhaldhunga
14-Feb-08	27.8	86.53	4.1	Taplejung
16-Feb-08	26.8	86.25	4.2	Siraha
02-Mar-08	29.69	81.76	4.4	Humla
17-Mar-08	29.76	81.53	4.6	Bajhang-Bajura border
08-May-08	27.5	87.52	4.2	Taplejung
20-May-08	28.33	83.33	4.3	Baglung
02-Jun-08	27.8	85.91	4.1	Sindhupalchowk
15-Jun-08	29.73	80.96	5.0	Darchula
20-Jun-08	27.98	85.73	4.8	Sindhupalchowk
02-Aug-08	28.18	85.29	4.4	Bajura
10-Sep-08	28.4	83.01	4.1	Baglung
07-Oct-08	27.47	87.71	4.5	Taplejung
01-Dec-08	28.18	85.29	4.8	Rasuwa
02-Dec-08	27.32	87.99	5.4	Taplejung
02-Dec-08	27.3	87.99	4.0	Taplejung
02-Dec-08	27.29	87.92	4.3	Taplejung
02-Dec-08	27.34	87.92	4.1	Taplejung
02-Dec-08	27.3	88.03	4.0	Taplejung
08-Dec-08	30.15	81.86	6.0	Humla
19-Dec-08	30.10	81.91	4.4	Humla
23-Dec-08	28.19	84.39	4.4	Lamjung
26-Dec-08	30.09	81.9	4.5	Humla
29-Dec-08	30.13	82.03	4.0	Humla
10-Jan-09	27.9	88.04	4.2	Taplejung
23-Jan-09	29.05	81.4	4.2	Achham
08-Mar-09	27.41	87.8	4.5	Taplejung
12-Mar-09	28.43	84.42	4.1	Lamjung
13-Apr-09	28.25	84.54	4.3	Lamjung
13-Apr-09	28.3	84.55	4.0	Lamjung
14-May-09	27.43	87.35	4.2	Sankhuwasava
14-May-09	27.48	87.36	4.6	Sankhuwasava
12-Jul-09	27.71	86.36	4.3	Dolakha
02-Aug-09	28.12	85.18	4.0	Rasuwa
26-Sep-09	29.81	82.05	4.3	Humla
29-Oct-09	28.73	83.11	4.1	Rukum
01-Nov-09	30.1	81.81	4.5	Humla
02-Nov-09	27.87	87.94	4.0	Taplejung
08-Nov-09	30.11	81.91	4.3	Humla
22-Nov-09	29.02	82.15	4.5	Jajarkot
15-Dec-09	28.28	84.4	4.1	Lamjung
16-Dec-09	29.6	81.51	4.6	Bajura
18-Jan-10	28.37	83.97	4.1	Kaski
17-Feb-10	26.79	86.08	4.1	Dhanusa
25-Feb-10	29.78	81.52	4.6	Bajhang
28-Feb-10	28.4	81.52	4.1	Baglung
01-Mar-10	29.76	83.11	4.3	Bajura
13-Apr-10	29.37	81.34	4.5	Bajura
14-Apr-10	28.31	83.09	4.2	Baglung
30-Apr-10	27.75	86.36	4.0	Dolakha
13-May-10	28.3	84.51	4.2	Lamjung
13-Jun-10	29.4	81.38	4.5	Bajura
13-Jun-10	29.6	81.65	4.8	Bajura
13-Jun-10	28.01	86.77	4.0	Solukhumbu
01-Sep-10	28.23	84.37	4.0	Lamjung
17-Oct-10	28.64	85.71	5.0	Tibet
25-Nov-10	28.38	82.32	4.5	Salyan
25-Nov-10	28.44	83.17	4.7	Baglung
30-Nov-10	26.93	85.79	4.4	Mahottari
05-Dec-10	29.57	81.699	4.2	Bajura
18-Dec-10	28.18	84.79	4.1	Gorkha

Table 10.1: Earthquake by Epicentre and Magnitude, 2008-2013

(contd...)

Date	Latitude	Longitude	Magnitude (ml)	Epicentre
18-Jan-11	30.03	81.97	4.1	Humla
18-Jan-11	27.8	85.94	4.3	Sindhupalchowk
13-Feb-11	27.47	87.01	4.7	Bhojpur-Sankhuwasabha border
22-Feb-11	27.57	87.01	4.2	Sankhuwasabha
10-Mar-11	28.02	85.24	4.3	Rasuwa
11-Mar-11	28.31	83.8	4.3	Kaski
12-Mar-11	28.31	83.78	4.4	Kaski
22-Mar-11	28.35	83.96	4.0	Kaski
22-Mar-11	28.11	82.74	4.2	Pyuthan
04-Apr-11	30	80.81	4.1	Darchula
04-Apr-11	29.92	80.54	5.7	Darchula
05-Apr-11	29.74	80.37	4.1	Darchula
07-Apr-11	27.93	85.61	4.1	Sindhupalchowk
03-Jun-11	27.6	88.03	5.2	Taplejung
11-Jun-11	28.4	82.55	4.1	Rolpa
11-Jun-11	28.41	82.66	4.2	Rolpa
17-Jun-11	30.24	81.48	4.2	Humla
18-Jun-11	27.83	87.35	4.3	Sankhuwasabha
15-Jul-11	27.28	87.3	4.5	Sankhuwasabha
29-Jul-11	27.19	86.76	4.2	Khotang
02-Aug-11	27.35	86.35	4.0	Khotang
09-Aug-11	29.9	81.31	4.3	Bajhang
15-Aug-11	27.44	86.27	5.0	Ramechhap
18-Aug-11	28.21	84.31	4.0	Lamjung
19-Aug-11	29.7	81.34	4.9	Bajhang
22-Aug-11	28.29	83.96	4.0	Kaski
25-Aug-11	28.15	82.53	4.4	Rolpa
27-Aug-11	26.94	86.6	5.0	Udayapur
18-Sep-11	27.78	88.32	6.8	Taplejung-Sikkim Border
01-Oct-11	30.16	81.81	4.7	Humla
02-Oct-11	29.55	81.68	4.2	Bajura
04-Nov-11	28.34	83.66	4.0	Parbat
08-Nov-11	27.94	85.55	4.1	Sindhupalchowk
13-Nov-11	28.2	84.93	5.0	Gorkha
19-Nov-11	27.7	86.1	4.1	Dolakha
23-Nov-11	28.91	81.68	4.2	Dailekh
02-Dec-11	28.05	85.34	4.2	Rasuwa
08-Dec-11	27.97	82.86	4.0	Pyuthan
09-Dec-11	27.83	88.13	4.2	Taplejung
14-Dec-11	27.72	88.09	4.9	Taplejung
18-Dec-11	27.73	88.16	4.6	Taplejung
30-Dec-11	29.62	81.53	4.0	Bajura
11-Jan-12	28.89	81.89	4.2	Dailekh
18-Jan-12	26.63	86.4	4.5	Siraha
19-Jan-12	29.73	81.91	4.6	Humla
24-Jan-12	26.84	86.43	4	Siraha
05-Feb-12	27.25	88.07	4	Panchthar
14-Feb-12	27.33	88.03	4.4	Taplejung
14-Feb-12	27.38	88.11	4.5	Taplejung-Sikkim Border
26-Feb-12	29.86	81.05	4.9	Bajhang-Darchula border
26-Feb-12	29.71	81.02	4.4	Bajhang-Darchula border
19-Mar-12	28.7	82.02	4.7	Karkigaun-Jajarkot
27-Mar-12	26.12	87.87	5.2	Jhapa-India Border Region
11-Apr-12	29.55	81.24	4.3	Bajhang
17-Apr-12	28.5	82.06	4.2	Salyan

(contd...)

30-May-12	27.31	87.88	4.2	Taplejung
09-Jun-12	28.32	84.17	5.1	Kaski
11-Jun-12	27.25	88	4.5	Panchthar - Sikkim border
15-Jun-12	28.99	81.58	4.2	Dailekh
01-Jul-12	27.27	88.05	4	Panchthar - Sikkim border
11-Jul-12	29.43	81.03	4.9	Southern Bajhang
28-Jul-12	30.12	80.54	5	India (close to Darchula)
31-Jul-12	28.55	82.37	4.2	Southern Rukum
31-Jul-12	28.53	82.42	4.8	Southern Rukum
31-Jul-12	28.58	82.48	5	Southern Rukum
06-Aug-12	27.77	88.13	4.2	Northern Taplejung
23-Aug-12	28.39	82.73	4.4	Rolpa
23-Aug-12	28.38	82.84	5.6	Rolpa - Rukum border region
24-Aug-12	28.42	82.75	5.2	Rolpa-Rukum border region
24-Aug-12	28.38	82.66	4.4	Rolpa
28-Aug-12	28.73	81.81	4.4	Southeastern Dailekh
29-Aug-12	28.4	82.79	4.3	Northern Rolpa
30-Aug-12	28.61	82.43	4.5	Southern Rukum
17-Sep-12	28.59	82.41	4.4	Southern Rukum
22-Oct-12	27.95	87.86	4.5	Around Kanchanjunga
11-Nov-12	29.51	81.13	5.6	Southern Bajhang
12-Nov-12	29.55	81.31	4.5	Bajhang
04-Dec-12	28.88	82.34	4	North East Jajarkot
22-Dec-12	28.27	82.84	4.5	Rolpa and Pyuthan border
02-Jan-13	29.41	81	4.7	Bajhang and Doti border
09-Jan-13	29.82	81.7	5.5	Northern part of Bajura
13-Jan-13	26.84	86.22	4	Siraha
18-Jan-13	29.48	81.26	4.5	Bajhang
07-Feb-13	29.42	81.05	4	Bajhang
22-Feb-13	28.39	83.18	4.1	Baglung
06-Mar-13	28.57	82.27	5.4	Rukum
17-Mar-13	26.74	86.08	4.2	Dhanusha
28-Apr-13	29.87	81.26	4.9	Northern Bajhang
14-May-13	29.65	81.98	4.5	Western Mugu
14-May-13	29.68	82	4.4	Mugu
14-May-13	29.56	82	4.3	Mugu
26-May-13	27.72	85.91	4.2	Sindhupalchok
31-May-13	29.74	81.6	4.5	Northern Bajura
09-Jun-13	27.31	86.7	4.2	Northern Khotang
26-Jun-13	26.85	85.96	4.4	Dhanusha
27-Jun-13	30.05	80.8	4.4	Darchula
28-Jun-13	28.76	82.4	5.5	Rukum
30-Aug-13	28.43	86.03	6	Tibet
12-Sep-13	26.96	87.34	4.5	Dhankuta
22-Sep-13	30.25	81.55	4.4	Humla
03-Oct-13	27.14	88.51	5.7	Sikkim
13-Oct-13	30.08	81.74	4.5	Humla
28-Oct-13	27.36	87.37	4.3	Sankhuwasava
03-Nov-13	29.56	81.68	4.3	Bajura

Source : Department of Mines and Geology (National Seismological Centre (NSC),Kathmandu)

Table 10.2 : Loss of Lives, Livestock and Other Effects by Type of Disaster,1983-2010

(Disasters: Flood, Cold, Landslide, Avalanches, Earthquake, Fire, Epidemic, Windstorm, Hailstone & Thunderbolt)

Year	Number of People		Number of Livestock Loss	Number of House Destroyed	Number of Affected Family	Land Affected (Ha.)	Public Infrastructure	Estimated Loss (Million NRs.)
	Dead	Injured						
1983	579	NA	248	12	NA	NA	NA	240
1984	941	NA	3547	10597	NA	1242	869	49
1985	1387	NA	3399	7166	NA	1355	436	23
1986	1512	NA	6566	3370	NA	1315	436	23
1987	881	162	1852	36220	97036	18858	421	2005
1988	1584	12538	2788	108801	70197	NA	4365	6099
1989	1716	3014	4240	7648	NA	NA	NA	4172
1990	913	196	867	6352	8462	1132	NA	139
1991	971	43	642	5510	6426	283	39	43
1992	1318	17	1586	13997	11535	135	66	52
1993	1524	246	NA	21911	90911	NA	NA	5189
1994	765	155	1329	3234	11701	392	NA	184
1995	873	1937	2053	10275	134216	41867.26	NA	1933
1996	895	1527	2480	30014	58329	6063.4	NA	1579
1997	1160	1120	1191	4825	46054	6063.4	NA	410
1998	1190	117	1179	15082	36987	326.89	NA	1230
1999	1466	146	650	4304	17842	182.4	NA	509
2000	377	162	1017	6886	24900	889	NA	1141.5
2001	415	132	665	6103	15908	NA	NA	526.65
2002	458	287	2126	19856	40935	10078	NA	525.56
2003	310	160	1125	6819	11730	2360	NA	989.93
2004	192	220	888	4818	16997	0	NA	341.09
2005	242	153	955	3169	4315	0	NA	387.21
2006	132	88	10098	3765	19023	3396.84	NA	392.31
2007	274	144	21861	37984	117203	513.65	NA	1928.55
2008	171	55	7066	13864	21600	21315	NA	1633.28
2009	641	117	228	1050	3028	NA	4.88	420.25
2010	448	261	1526	23370	19026	200 no	2.85	1398.19
2011	507	666	864	11348	12135	NA	NA	7051.62
2012	385	384	1181	4235	3645	NA	NA	1293.96
2013	460	494	1536	2510	2710	NA	NA	3425.59

Source: Department of Water Induced Disaster Prevention & MOHA

Table 10.3 : Most lethel disaster types and their impacts in Nepal(1971-2012)

Disaster types	Number of events/records	Number of Deaths	Number of injuries	Affected family	Destroyed houses	Damaged houses
Epidemic	3446	16563	43076	512969	0	0
Landslide	2942	4511	1566	555705	18414	13773
Flood	3685	4079	488	3665608	94700	87261
Fire	6999	1416	1347	255172	75581	2282
Thunderbolt	1403	1200	2257	6729	379	427
Accident	1000	969	359	2137	5	415
Earthquake	105	880	6840	4539	33708	55318
Cold wave	390	515	83	2393	0	0
Structural collapse	389	404	596	2016	1170	623
Boat capsize	140	279	140	410	0	0
Others	2892	1092	1458	928492	5210	9998
Grand Total	**23391**	**31908**	**58210**	**5936170**	**229167**	**170097**

Source: DesInventar 2011, MOHA 2011 and 2012

Table 10.4 : Human casualties due to major disasters in Nepal, 1983-2013

Year	Flood & Landslides	Earthquake	Windstorms, Hailstorm & Thunderbolt	Avalanche	Fire	Epidemic	Boat Capsize, Cold wave & Drowning	Stampede	Total
1983	293	0	NA	0	69	217		0	579
1984	363	0	NA	0	57	521		0	941
1985	420	0	NA	0	52	915		0	1387
1986	315	0	NA	0	96	1101		0	1512
1987	391	0	2	0	62	426		0	881
1988	328	721	NA	14	23	427		71	1584
1989	680	0	28	20	109	879		0	1716
1990	307	0	57	0	46	503		0	913
1991	93	0	63	0	90	725		0	971
1992	71	2	20	0	97	128		0	318
1993	1336	0	45	0	43	100		0	1524
1994	49	0	47	0	43	626		0	765
1995	203	0	34	43	73	520		0	873
1996	258	3	75	4	61	494		0	895
1997	83	0	49	12	65	951		0	1160
1998	273	0	23	0	54	840		0	1190
1999	193	0	22	5	39	1207		0	1466
2000	173	0	26	0	37	141		0	377
2001	196	1	38	0	26	154		0	415
2002	441	0	6	0	11	0		0	458
2003	232	0	62	0	16	0		0	310
2004	131	0	10	0	10	41		0	192
2005	141	0	18	21	28	34		0	242
2006	114	0	15	0	3	0		NA	132
2007	216	0	40	6	9	3		NA	274
2008	134	0	16	0	11	10		0	171
2009	135	0	7	2	35	462		0	641
2010	240	0	70	0	69	36		NA	415
2011	252	6	114	0	46	9	80	NA	507
2012	112	1	148	9	77	33	5	NA	385
2013	219	0	154	8	59	4	16	NA	460

Source: MOHA & Department of Water Induced Disaster Prevention

Table 10.5 : Annual Disease Report, 2013

Diseases Name	Epizootiology of the diseases			Disease control	
	Number of			Number of animals	
	Outbreaks	Affected	Dead	Vaccinated	Treated
Foot and mouth disease	266	21202	589	110991	20613
Peste des petits rumunants	27	2333	370	500487	1963
Sheep and goat pox	39	416	2	0	414
Classical swine fever (Hog cholera)	5	23	9	7760	14
Newcastle disease/Ranikhet	132	104412	8139	328015	96273
Highly Pathogenic Avian Influenza	204	175504	175504	1886686 Birds Destroyed	
Anthrax	7	19	19	129	0
Rabies	54	93	93	24731	0
Anaplasmosis	4	44	0	0	44
Babesiosis	100	243	4	0	239
Haemorrhagic septicaemia	101	2232	256	259854	1976
Theileriosis	33	41	1	0	40
Fowl cholera	20	6203	89	0	6114
Fowl pox	429	32359	518	21610	31841
Fowl typhoid (S.gallinarum)	36	45101	731	0	44370
(Gumboro disease)	381	255235	9149	243402	246086
Marek's disease	0	0	0	18000	0
Mycoplasmosis (M.gallisepticum)	138	162783	4893	0	157890
Pullorum disease(S.pullorum)	159	9431	470	0	8961
Blackquarter	56	2381	78	275249	2303
Actionomycosis/Lumpy jaw	68	229	0	0	229
Coccidiosis	1861	189865	6727	0	183138
Distomatosis	0	498694	505	0	498189
Warble infection	433	5877	0	0	5877
Contagious pustular dermatitis	152	2346	0	0	2346
Enterotoxaemia	242	1590	99	0	1491
Infectious coryza	30	1365	3	0	1362
Abortion	4030	19872	1	0	19871
Cough	1624	17221	0	0	17221
Colibacillosis	171	131759	7445	0	124314
Calf-scour	254	852	0	0	852
Degnala disease	4	14	0	0	14
Diarrhoea	13185	284887	4933	0	279954
Dystocia	0	7897	103	0	7794
Enzootic bovine haematuria	164	641	8	0	633
Ephemeral fever	640	4640	1	0	4639
External parasites	0	231819	104	0	231715
Foot lesion	9	935	0	0	935
Gastro - intestinal nematodes	19	11324	3	0	11321
Infertility	7130	61042	0	0	61042
Intestinal helminthiasis	863	94256	540	0	93716
Khari disease	100	1195	10	0	1185
Milk fever	334	851	0	0	851
Mange	0	87026	102	0	86924
Metritis	315	778	0	0	778
Mycotoxicosis	104	180696	1943	0	178753
Nervous sign	1616	7428	54	0	7374
Parasitic gastroenteritis	0	241669	68	0	241601
Pneumonia	360	3203	10	0	3193
Paramphistomosis	0	189727	80	0	189647
Parvo virus enteritis	19	240	13	19	227
Respiratory disease -unclassified	889	231458	8641	0	222817
Respiratory sign	7186	69359	334	0	69025
Red urine	1652	5789	71	0	5718
Tetanus	6	8	3	0	5
Tympany	4373	31489	125	0	31364

Source: Veterinary Epidemiology center

Table 10.6 : Infection Cases by Disease

Infection Diseases	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Malaria									
Total Slide Examination	135781	170988	137444	152492	148693	136719	135363	133730	134909
Total Positive	4557	5691	5293	4574	3577	2920	3239	2857	2172
Kala-azar									
Number of Patient	1169	1341	1531	1371	1019	791	806	118	305
Death due to Kala-azar	NA	NA	14	14	6	4	4	3	0
Tuberculosis									
TB case finding rate(%)	NA	65	70	72	75	76	73	73	78
Treatment Success Rate (Percent)	88	88	89	88	89	90	90	90	90
Leprosy									
New Case Detection Rate/10,000	2.40	1.96	1.67	1.67	1.99	1.15	1.12	1.01	1.19
Prevalence Rate/10,000	2.02	1.65	1.45	1.42	1.09	0.77	0.79	0.85	0.82
Other Transmitting Diseases									
ARI reported Deaths	227	228	252	163	237	319	646	201	1793
Total Diarrhoeal deaths	244	82	113	206	147	91	44	45	116
Incidence of diarrhoea /1000 < 5 year population	219	204	185	378	488	598	500	528	578

Note: ARI= Acute Respiratory Tract Infection
Source: Department of Health Services, Annual Report, 2004/05 -2012/13

Appendices

Appendix I:

List of Environmental Related Policies, Acts and Rules

A) Instruments Having Environment Friendly Policies:

1. Interim Constitution of Nepal, 2007(2063)
2. Environment Conservation Policy, 2044 (1988)
3. Nepal Environmental Policy and Action Plan, 2050 (1993)
4. Wildlife Protection, Fertility and Research Policy, 2060 (2004)
5. Solid Waste (Management & Resource Mobilization)
6. Tenth Plan 2000/01

B) Acts Having Environment Friendly Provisions:

1. Ancient Monuments Protection Act,1956
2. Civil Aviation Act, 1958
3. Aquatic Animals Protection Act, 1960
4. Plant Protection Act, 1964
5. National Parks & Wild Life Conservation Act, 1973
6. Public Road Act, 1974
7. Trust Corporation Act, 1976
8. Tourism Act, 1978
9. Nature Conservation Trust Act, 1982
10. Soil & Watershed Conservation Act, 1982
11. Nepal Petroleum Act, 1983
12. Nepal Electricity Authority Act, 1984
13. Mines & Mineral Act, 1985
14. Pashupati Area Development Trust Act, 1987
15. Solid Waste (Management & Resource Mobilization) Act, 1987
16. Town Development Act, 1988
17. Kathmandu Valley Development Authority Act, 1988
18. Nepal Water Supply Corporation Act, 1989
19. The Constitution of the Kingdom of Nepal, 1990
20. Pesticides Act, 1991
21. Local Self-government Act 1992
22. Water Resources Act, 1992
23. Forest Act, 1993
24. Electricity Act, 1992
25. Motor Vehicle & Transportation Management Act, 1992
26. Labour Act, 1992
27. Industrial Enterprises Act, 1992
28. Nepal Tourism Board Act, 1996
29. Environment Protection Act, 1996

C) Rules:

1. National Parks & Wild Life Conservation Rules, 1973
2. Plant Protection Rules, 1974
3. Wild Life Reserve Rules, 1977
4. Himalayan National Park Rules, 1979
5. Mountaineering Rules, 1979
6. Nature Conservation Trust Rules, 1984
7. Petroleum Rules, 1984
8. Khaptad National Park Rules, 1987
9. Ancient Monuments Protection Rules, 1989
10. Solid Waste (Management & Resource Mobilization) Rules, 1989
11. Water Resources Rules, 1993
12. Pesticides Rules, 1993

13. Labour Rules, 1993
14. Electricity Rules, 1993
15. Forest Rules, 1995
16. Buffer Zone Management Rules, 1995
17. Bardiya National Park Rules, 1996
18. Conservation Area Management Rules, 1996
19. Vehicle & Transportation Management Rules, 1997
20. Environment Protection Rules, 1997
21. Labour Rules, 1993
22. Local Self-government Rules 1993

Source: Ministry of Environment, Science and Technology

Appendix II:

Integrated Environmental and Economic Accounting 2003 (SEEA 2003)

SEEA 2003 is a satellite system of the System of National Accounts that brings together economic and environmental information in a common framework to measure the contribution of the environment to the economy and the impact of the economy on the environment. It provides policy-makers with indicators and descriptive statistics to monitor these interactions as well as a database for strategic planning and policy analysis to identify more sustainable paths of development.

The SEEA 2003 comprises four categories of accounts:

- **Flow accounts for pollution, energy and materials (Chapters 3 and 4).** These accounts provide information at the industry level about the use of energy and materials as inputs to production and the generation of pollutants and solid waste.

- **Environmental protection and resource management expenditure accounts (Chapters 5 and 6).** These accounts identify expenditures incurred by industry, government and households to protect the environment or to manage natural resources. They take those elements of the existing SNA which are relevant to the good management of the environment and show how the environment-related transactions can be made more explicit.

- **Natural resource asset accounts (Chapters 7 and 8).** These accounts record stocks and changes in stocks of natural resources such as land, fish, forest, water and minerals.

- **Valuation of non-market flow and environmentally adjusted aggregates (Chapters 9 and 10).** This component presents non-market valuation techniques and their applicability in answering specific policy questions. It discusses the calculation of several macroeconomic aggregates adjusted for depletion and degradation costs and their advantages and disadvantages. It also considers adjustments concerning the so-called defensive expenditures.

The revision was undertaken under the joint responsibility of the United Nations, Eurostat, IMF, OECD and the World Bank. Much of the work was done by the London Group on Environmental Accounting.

Source: United Nations, Statistics Division (Handbook of National Accounting: Integrated Environmental and Economic Accounting 2003)

Appendix III:

List of Conventions Signed and/or Ratified by the Government of Nepal

S. N.	Name of Convention	Ratification	Entry into Force in Nepal
1	UN Convention to Combat Desertification in those Countries Experiencing Serious Drought and / or Desertification Particularly in Africa,1994	10 Sept, 1996	13 Jan, 1997
2	UN Framework Convention on Climate Change, 1992	2 May, 1994	31 Jul, 1994
3	Convention on Biodiversity Diversity May 22,1992 Bio-safety Protocol	23 Nov,1993	21 Feb, 1994
4	Agreement on the Network of Aquaculture Centers in Asia and the Pacific Region,1988		4 Jan,1990
5	Convention on Wetlands of International Importance especially as Waterfowl habitat, 1971	17 Dec ,1975	17 Apr,1988
6	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1973	18 June, 1975	16 Sep,1975
7	Plant Protection Agreement for the South East Asia and Pacific Region (as amended) 1956	12 Aug,1965	12 Aug,1965
8	Convention on the High Seas,1958	28 Dec, 1962	27 Jan,1963
9	Treaty Banning Nuclear Weapon Test in the Atmosphere, in outer Space and Sea-bed 1963	7 Oct, 1964	7 Oct, 1964
10	Treaty on Prohibition of the Emplacement Nuclear Weapons and Other Weapons of Mass destruction on the Sea-bed and the Ocean Floor and in the Subsoil Thereof 1971	6 Jul, 1971	18 May, 1972
11	Convention for the Protection of the World Cultural and Natural Heritage, 1972	21 Jun,19785	20 Sept, 1978
12	International Agreement for Tropical Timber (ITTA),1983		3 Jul ,1990
13(a)	Vienna Convention for the Protection of the Ozone Layer , 1985	6 Apr, 1994	4 Oct,1994
13(b)	Montreal Protocol substances that Deplete the Ozone Layer (Montreal Protocol), 1987	6 Jul, 1994	4 Oct,1994
13(c)	London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (London Agreement), 1990	6 Jul, 1994	4 Oct,1994
14	Basel Convention on the Control of Tran boundary Movements of Hazardous Wastes (Basel Convention), 1989 .	15 Aug, 1996	13 Jan, 1997
15	Treaty on Principals Governing the activities of State in the Exploration and Use of Outer Space including and Other the Moon Celestial Bodies, 1967		10 Oct, 1967
16	Kyoto Protocol	16 Sept,2005	14 Dec, 205
17	Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972		1 Jan,1973
18	Stockholm Convention on Persistent Organic Pollutants	2006	2002
19	Prior Informed Consent Convention	2006	2002
	Signed		
1	Convention on the Prohibition of the Development, Production and stockpiling of Bacteriological and Toxic Weapons and on their Destruction,1972		10 Apr,1972
2	United Nations on the Law of the Sea, 1982		10 Dec,1982
3	Convention on Fishing and Convention of the Living Resources of the High Sea, 1958.		29 Apr,1958
4	Convention on the Continental Shelf, 1958.		29 Apr,1958

Source: Ministry of Environment, Science and Technology

Appendix IV:

United Nations Environment Programme

The **United Nations Environment Programme** (**UNEP**) coordinates United Nations environmental activities, assisting developing countries in implementing environmentally sound policies and encourages sustainable development through sound environmental practices. It was founded as a result of the United Nations Conference on the Human Environment in June 1972 and has its headquarters in Nairobi,Kenya. UNEP also has six regional offices and various country offices.

UNEP is the designated authority of the United Nations system in environmental issues at the global and regional level. Its mandate is to coordinate the development of environmental policy consensus by keeping the global environment under review and bringing emerging issues to the attention of governments and the international community for action. The mandate and objectives of UNEP emanate from United Nations General Assembly resolution 2997 (XXVII) of 15 December 1972 and subsequent amendments adopted at UNCED in 1992, the Nairobi Declaration on the Role and Mandate of UNEP, adopted at the Nineteenth Session of the UNEP Governing Council, and the Malmo Ministerial Declaration of 31 May 2000.

Its activities cover a wide range of issues regarding the atmosphere, marine and terrestrial ecosystems. It has played a significant role in developing international environmental conventions, promoting environmental science and information and illustrating the way those can work in conjunction with policy, working on the development and implementation of policy with national governments and regional institution and working in conjunction with environmental Non-Governmental Organizations (NGOs). UNEP has also been active in funding and implementing environmentally related development projects.

UNEP has aided in the development of guidelines and treaties on issues such as the international trade in potentially harmful chemicals, transboundary air pollution, and contamination of international waterways. The World Meteorological Organization and the UNEP established the Intergovernmental Panel on Climate Change (IPCC) in 1988. UNEP is also one of several Implementing Agencies for the Global Environment Facility (GEF).

Structure

UNEP's Governing Council consists of a total of 58 member states which serve three-year terms. These seats are allocated according to geographical regions. The Governing Council is the primary developer of policy guidelines for UN environmental programs and plays a diplomatic role in promoting cooperation between UN member states on environmental issues. The UNEP secretariat consists of 890 staff members, roughly 500 of which are international staff while the remaining are hired locally. The Secretariat is the body which oversees the implementation of UNEP policies and programs and is responsible for the annual budget which totals around $105 million (US) and is almost entirely earned from member states. The implementation of UNEP's work is done by the following 7 Divisions:

- Early Warning and Assessment
- Environmental Policy Implementation
- Technology, Industry and Economics
- Regional Cooperation
- Environmental Law and Conventions
- Global Environment Facility Coordination
- Communications and Public Information

Executive Director

UNEP's current Executive Director is Achim Steiner, who succeeded previous director Klaus Töpfer in 2006. Dr Töpfer served two consecutive terms, beginning in February 1998. On 15 March 2006, the former Secretary-General of the United Nations, Kofi Annan (currently Ban Ki Moon), nominated Achim Steiner, former Director General of the IUCN to the position of Executive Director. One day later, the UN General Assembly followed Annan's proposal and elected him [2]. However, the nomination raised questions regarding conflict of interest

after it was revealed that Steiner had (previous to his nomination by Annan) served as a judge on a panel that awarded the $500,000 Dubai prize to Mr. Annan. The London-based *Financial Times* reported that the appointment "has prompted new questions about what standards should apply to senior U.N. officials to avoid conflicts of interest". The position was held for 17 years (1975-1992) by Dr. Mostafa Kamal Tolba, who was instrumental in bringing environmental considerations to the forefront of global thinking and action. Under his leadership, UNEP's most widely acclaimed success - the historic 1987 agreement to protect the ozone layer - the Montreal Protocol was negotiated.

During December 1972, the UN General Assembly unanimously elected Maurice Strong to head UNEP. Also Secretary General of both the 1972 United Nations Conference on the Human Environment, which launched the world environment movement, and the 1992 Earth Summit, Strong has played a critical role is globalizing the environmental movement.

International Years

The year 2007 was declared (International) Year of the Dolphin by the United Nations and UNEP. The UN Convention on Migratory Species, together with its specialized agreements on dolphin conservation ACCOBAMS and ASCOBANS and the WDCS (Whale and Dolphin Conservation Society) have proposed 2007 as the Year of the Dolphin ('YOD')) (International) Patron of the Year of the Dolphin is H.S.H. Prince Albert II of Monaco, with Special Ambassador to the cause being Nick Carter, of The Backstreet Boys.[2] (See international observance and list of environmental dates.)

Reports

UNEP publishes many reports, atlases and newsletters. For instance, the fourth Global Environment Outlook (GEO-4) assessment is a comprehensive report on environment, development and human well-being, providing analysis and information for policy makers and the concerned public. One of many points in the GEO-4 warns that we are living far beyond our means. It notes that the human population is now so large that the amount of resources needed to sustain it exceeds what is available. Humanity’s environmental demand, or ecological footprint, is 21.9 hectares per person while the Earth’s biological capacity is, on average, only 15.7 ha/person.

Famous World projects

UNEP has sponsored the development of solar loan programs, with attractive return rates, to buffer the initial deployment costs and entice consumers to consider and purchase solar PV systems. The most famous example is the solar loan program sponsored by UNEP helping 100,000 people finance solar power systems in India.[4] Success in India's solar program has led to similar projects in other parts of developing world like Tunisia, Morocco, Indonesia and Mexico.

UNEP sponsors the Marshlands project in Middle East that helps to protect the largest marshland in Middle East. In 2001, UNEP alerted the international community to the destruction of the Marshlands when it released satellite images showing that 90 percent of the Marshlands had already been lost. The UNEP "support for Environmental Management of the Iraqi Marshland" commenced in August 2004, in order to manage the Marshland area in an environmentally sound manner.[5]

Glaciers shrinking

Glaciers are shrinking at record rates and many could disappear within decades, the U.N. Environment Program said on March 16, 2008. The scientists measuring the health of almost 30 glaciers around the world found that ice loss reached record levels in 2006. On average, the glaciers shrank by 4.9 feet in 2006, the most recent year for which data are available. The most severe loss was recorded at Norway's Breidalblikkbrea glacier, which shrank 10.2 feet in 2006. Glaciers lost an average of about a foot of ice a year between 1980 and 1999. But since the turn of the millennium the average loss has increased to about 20 inches

Appendix V:

Rio Declaration on Environment and Development (Agenda 21)

The United Nations Conference on Environment and Development, Having met at Rio de Janeiro from 3 to 14 June 1992,

Reaffirming the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972, a/ and seeking to build upon it,

With the goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of societies and people,

Working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system,

Recognizing the integral and interdependent nature of the Earth, our home,

Proclaims that:

Principle 1
Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Principle 2
States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Principle 3
The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4
In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

Principle 5
All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

Principle 6
The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

Principle 7
States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Principle 8
To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

Principle 9
States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

Principle 10
Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

Principle 11
States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.

Principle 12
States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.

Principle 13
States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.

Principle 14
States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.

Principle 15
In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 16
National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

Principle 17
Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

Principle 18
States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.

Principle 19
States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.

Principle 20
Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

Principle 21
The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

Principle 22
Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Principle 23
The environment and natural resources of people under oppression, domination and occupation shall be protected.

Principle 24
Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.

Principle 25
Peace, development and environmental protection are interdependent and indivisible.

Principle 26
States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.

Principle 27
States and people shall cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

Source: Report of the United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972 (United Nations publication, Sales No. E.73.II.A.14 and corrigendum), chap. I.

Appendix VI:

International Standard Industrial Classification of All Economic Activities (ISIC), Rev 4

A. Agriculture, forestry and fishing

01 Crop and animal production, hunting and related service activities
02. Forestry and logging
03. Fishing and aquaculture

B. Mining and quarrying

05. Mining of coal and lignite
06. Extraction of crude petroleum and natural gas
07. Mining of metal ores
08. Other mining and quarrying
09. Mining support service activities

C. Manufacturing

10. Manufacture of food products

11. Manufacturing of beverages

12. Manufacture of tobacco products
13. Manufacture of textiles
14. Manufacture of wearing apparel
15. Manufacture of leather and related products
16. Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles and straw and plaiting materials
17. Manufacture of paper and paper products
18. Printing and reproduction of recorded media
19. Manufacture of coke and refined petroleum products
20. Manufacture of chemicals and chemical products
21. Manufacture of pharmaceuticals medicinal chemical and botanical products
22. Manufacture of rubber and plastics products
23. Manufacture of other non - metallic mineral products
24. Manufacturer of basic metals
25. Manufacture of fabricated metal products, except machinery and equipment
26. Manufacture of computer, electronic and optical products
27. Manufacture of electrical equipment
28. Manufacture of machinery and equipment n .e .c
29. Manufacture of motor vehicles, trailers and semi - trailers
30. Manufacture of other transport equipment
31. Manufacture of furniture
32. Other manufacturing
33. Repair and installation of machinery and equipment

D. Electricity, gas, steam and air conditioning supply

35. Electricity, gas, team and air conditioning supply

E. Water supply; sewerage, waste management and remediation activities

36. Water collection, treatment and supply
37. Sewerage
38. Waste collection, treatment and disposal activities; materials recovery
39. Remediation activities and other waste management services

F. Construction

41. Construction of buildings

42. Civil engineering
43. Specialized construction activities

G. Wholesale and retail trade; repair of motor vehicles and motorcycles

45. Wholesale and retail trade and repair of motor vehicles and motorcycles
46. Wholesale trade, except of motor vehicles and motorcycles
47. Retail trade, except of motor vehicles and motorcycles

H. Transportation and storage

49. Land transport and transport via pipelines
50. Water transport
51. Air transport
52. Warehousing and support activities for transportation
53. Postal and courier activities

I. Accommodation and food service activities

55. Accommodation
56. Food and beverage service activities

J. Information and communication

58. Publishing activities
59. Motion picture, video and television programme production, sound recording and music publishing activities)
60. Programming and broadcasting activities
61. Telecommunications
62. Computer programming, consultancy and related activities
63. Information services activities

K. Financial and insurance activities

64. Financial service activities, except insurance and pension funding
65. Insurance, reinsurance and pension funding except compulsory social security
66. Activities auxiliary to financial service and insurance activities

L. Real estate activities

68. Real estate activities

M. Professional, scientific and technical activities

69. Legal and accounting activities
70. Activities of head office; management consultancy activities
71. Architectural and engineering activities; technical testing and analysis
72. Scientific research and development
73. Advertising, market research
74. Other professional, scientific and technique activities
75. Veterinary activities

N. Administrative and support service activities

77. Rental and leasing activities
78. Employment activities
79. Travel agency, tour operator, reservation service and related activities
80. Security and Investigation activities
81. Service to buildings and landscape activities
82. Office administrative, office support and other business support activities

O. Public administration and defense; compulsory social security

84. Public administration and defense; compulsory social security

P. Education

85. Education

Q. Human health and social work activities

86. Human health activities

87. Residential care activities
88. Social work activities without accommodation

R. Arts, entertainment and recreation

90. Creative, arts and entertainment activities
91. Libraries, archives, museums, and other cultural activities
92. Gambling and betting activities
93. Sports activities and amusement and recreation activities

S. Other service activities

94. Activities of membership organizations
95. Repair of computers and personal and household goods
96. Other personal service activities

T. Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

97. Activities of households as employers of domestic personnel
98. Undifferentiated goods and services producing activities of private households for own use

U. Activities of extraterritorial organizations and bodies

99. Activities of extraterritorial organizations and bodies

Source: United Nations Statistics Division

Appendix VII:

Central Product Classification (CPC), Ver. 2

0. Agriculture, forestry and fishery products
- 01 Products of agriculture, horticulture and market gardening
- 02 Live animals and animal products (excluding meat)
- 03 Forestry and logging products
- 04 Fish and other fishing products

1. Ores and minerals; electricity, gas and water
- 11 Coal and lignite; peat
- 12 Crude petroleum and natural gas
- 13 Uranium and thorium ores and concentrates
- 14 Metal ores
- 15 Stone, sand and clay
- 16 Other minerals
- 17 Electricity, town gas, steam and hot water
- 18 Natural water

2. Food products, beverages and tobacco; textiles, apparel and leather products
- 21 Meat, fish, fruit, vegetables, oils and fats
- 22 Dairy products and egg products
- 23 Grain mill products, starches and starch products; other food products
- 24 Beverages
- 25 Tobacco products
- 26 Yarn and thread; woven and tufted textile fabrics
- 27 Textile articles other than apparel
- 28 Knitted or crocheted fabrics; wearing apparel
- 29 Leather and leather products; footwear

3. Other transportable goods, except metal products, machinery and equipment
- 31 Products of wood, cork, straw and plaiting materials
- 32 Pulp, paper and paper products; printed matter and related articles
- 33 Coke oven products; refined petroleum products; nuclear fuel
- 34 Basic chemicals
- 35 Other chemical products; man-made fibers
- 36 Rubber and plastics products
- 37 Glass and glass products and other nonmetallic products n.e.c.
- 38 Furniture; other transportable goods n.e.c.
- 39 Wastes or scraps

4. Metal products, machinery and equipment
- 41 Basic metals
- 42 Fabricated metal products, except machinery and equipment
- 43 General-purpose machinery
- 44 Special-purpose machinery
- 45 Office, accounting and computing machinery
- 46 Electrical machinery and apparatus
- 47 Radio, television and communication equipment and apparatus

48 Medical appliances, precision and optical instruments, watches and clocks
49 Transport equipment

5. Constructions and construction services

53 Constructions
54 Construction services

6. Distributive trade services; accommodation, food and beverage serving services; transport services; and electricity, gas and water distribution services

61 Wholesale trade services
62 Retail trade services
63 Accommodation, food and beverage services
64 Passenger transport services
65 Freight transport services
66 Rental services of transport vehicles with operators
67 Supporting transport services
68 Postal and courier services
69 Electricity, gas and water distribution (on own account)

7. Financial and related services; real estate services; and rental and leasing services

71 Financial and related services
72 Real estate services
73 Leasing or rental services without operator

8. Business and production services

81 Research and development services
82 Legal and accounting services
83 Other professional, technical and business services
84 Telecommunications, broadcasting and information supply services
85 Support services
86 Support services to agriculture, hunting, forestry, fishing, mining and utilities
87 Maintenance, repair and installation (except construction) services
88 Manufacturing services on physical inputs owned by others
89 Other manufacturing services; publishing, printing and reproduction services; materials recovery services

9. Community, social and personal services

91 Public administration and other services provided to the community as a whole; compulsory social security services
92 Education services
93 Human health and social care services
94 Sewage and waste collection, treatment and disposal and other environmental protection services
95 Services of membership organizations
96 Recreational, cultural and sporting services
97 Other services
98 Domestic services
99 Services provided by extraterritorial organizations and bodies

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Source: United Nations Statistics Division

Appendix VIII:

Classification of Functions of Government (COFOG)

01 - General public services

- 01.1 - Executive and legislative organs, financial and fiscal affairs, external affairs
- 01.2 - Foreign economic aid
- 01.3 - General services
- 01.4 - Basic research
- 01.5 - R&D General public services
- 01.6 - General public services n.e.c.
- 01.7 - Public debt transactions
- 01.8 - Transfers of a general character between different levels of government

02 - Defence

- 02.1 - Military defence
- 02.2 - Civil defence
- 02.3 - Foreign military aid
- 02.4 - R&D Defence
- 02.5 - Defence n.e.c.

03 - Public order and safety

- 03.1 - Police services
- 03.2 - Fire-protection services
- 03.3 - Law courts
- 03.4 - Prisons
- 03.5 - R&D Public order and safety
- 03.6 - Public order and safety n.e.c.

04 - Economic affairs

- 04.1 - General economic, commercial and labour affairs
- 04.2 - Agriculture, forestry, fishing and hunting
- 04.3 - Fuel and energy
- 04.4 - Mining, manufacturing and construction
- 04.5 - Transport
- 04.6 - Communication
- 04.7 - Other industries
- 04.8 - R&D Economic affairs
- 04.9 - Economic affairs n.e.c.

05 - Environmental protection

- 05.1 - Waste management
- 05.2 - Waste water management
- 05.3 - Pollution abatement
- 05.4 - Protection of biodiversity and landscape
- 05.5 - R&D Environnemental protection
- 05.6 - Environnemental protection n.e.c.

06 - Housing and community amenities

- 06.1 - Housing development
- 06.2 - Community development
- 06.3 - Water supply
- 06.4 - Street lighting
- 06.5 - R&D Housing and community amenities
- 06.6 - Housing and community amenities n.e.c.

07 - Health

- 07.1 - Medical products, appliances and equipment
- 07.2 - Outpatient services
- 07.3 - Hospital services
- 07.4 - Public health services
- 07.5 - R&D Health
- 07.6 - Health n.e.c.

08 - Recreation, culture and religion

- 08.1 - Recreational and sporting services
- 08.2 - Cultural services
- 08.3 - Broadcasting and publishing services
- 08.4 - Religious and other community services
- 08.5 - R&D Recreation, culture and religion
- 08.6 - Recreation, culture and religion n.e.c.

09 - Education

- 09.1 - Pre-primary and primary education
- 09.2 - Secondary education
- 09.3 - Post-secondary non-tertiary education
- 09.4 - Tertiary education
- 09.5 - Education not definable by level
- 09.6 - Subsidiary services to education
- 09.7 - R&D Education
- 09.8 - Education n.e.c.

10 - Social protection

- 10.1 - Sickness and disability
- 10.2 - Old age
- 10.3 - Survivors
- 10.4 - Family and children
- 10.5 - Unemployment
- 10.6 - Housing
- 10.7 - Social exclusion n.e.c.
- 10.8 - R&D Social protection
- 10.9 - Social protection n.e.c.

Source : United Nations Statistics Division

Appendix IX:

Classification of Individual Consumption by Purpose (COICOP)

01-12 - Individual consumption expenditure of households

01 - Food and non-alcoholic beverages

- 01.1 - Food
- 01.2 - Non-alcoholic beverages

02 - Alcoholic beverages, tobacco and narcotics

- 02.1 - Alcoholic beverages
- 02.2 - Tobacco
- 02.3 - Narcotics

03 - Clothing and footwear

- 03.1 - Clothing
- 03.2 - Footwear

04 - Housing, water, electricity, gas and other fuels

- 04.1 - Actual rentals for housing
- 04.2 - Imputed rentals for housing
- 04.3 - Maintenance and repair of the dwelling
- 04.4 - Water supply and miscellaneous services relating to the dwelling
- 04.5 - Electricity, gas and other fuels

05 - Furnishings, household equipment and routine household maintenance

- 05.1 - Furniture and furnishings, carpets and other floor coverings
- 05.2 - Household textiles
- 05.3 - Household appliances
- 05.4 - Glassware, tableware and household utensils
- 05.5 - Tools and equipment for house and garden
- 05.6 - Goods and services for routine household maintenance

06 - Health

- 06.1 - Medical products, appliances and equipment
- 06.2 - Outpatient services
- 06.3 - Hospital services

07 - Transport

- 07.1 - Purchase of vehicles
- 07.2 - Operation of personal transport equipment
- 07.3 - Transport services

08 - Communication

- 08.1 - Postal services
- 08.2 - Telephone and telefax equipment
- 08.3 - Telephone and telefax services

09 - Recreation and culture

- 09.1 - Audio-visual, photographic and information processing equipment
- 09.2 - Other major durables for recreation and culture
- 09.3 - Other recreational items and equipment, gardens and pets

09.4 - Recreational and cultural services
09.5 - Newspapers, books and stationery
09.6 - Package holidays

10 - Education

10.1 - Pre-primary and primary education
10.2 - Secondary education
10.3 - Post-secondary non-tertiary education
10.4 - Tertiary education
10.5 - Education not definable by level

11 - Restaurants and hotels

11.1 - Catering services
11.2 - Accommodation services

12 - Miscellaneous goods and services

12.1 - Personal care
12.2 - Prostitution
12.3 - Personal effects n.e.c.
12.4 - Social protection
12.5 - Insurance
12.6 - Financial services n.e.c.
12.7 - Other services n.e.c.

13 - Individual consumption expenditure of non-profit institutions serving households (NPISHs)

13.1 - Housing
13.2 - Health
13.3 - Recreation and culture
13.4 - Education
13.5 - Social protection
13.6 - Other services

14 - Individual consumption expenditure of general government

14.1 - Housing
14.2 - Health
14.3 - Recreation and culture
14.4 - Education
14.5 - Social protection

Source: United Nations Statistics Division

Appendix X:

Classification of the Purposes of Non-Profit Institutions (COPNI)

01 - Housing
- 01.0 - Housing

02 - Health
- 02.1 - Medical products, appliances and equipment
- 02.2 - Outpatient services
- 02.3 - Hospital services
- 02.4 - Public health services
- 02.5 - R&D Health
- 02.6 - Other health services

03 - Recreation and culture
- 03.1 - Recreational and sporting services
- 03.2 - Cultural services

04 - Education
- 04.1 - Pre-primary and primary education
- 04.2 - Secondary education
- 04.3 - Post-secondary non-tertiary education
- 04.4 - Tertiary education
- 04.5 - Education not definable by level
- 04.6 - R&D Education
- 04.7 - Other educational services

05 - Social protection
- 05.1 - Social protection services
- 05.2 - R&D Social protection

06 - Religion
- 06.0 - Religion

07 - Political parties, labour and professional organizations
- 07.1 - Services of political parties
- 07.2 - Services of labour organizations
- 07.3 - Services of professional organizations

08 - Environmental protection
- 08.1 - Environmental protection services
- 08.2 - R&D Environmental protection

09 - Services n.e.c.
- 09.1 - Services n.e.c.
- 09.2 - R&D Services n.e.c.

Source: United Nations, Statistics Division

Appendix XI:

Classification of the Outlays of Producers according to Purpose (COPP)

01 Outlays on Infrastructure

- 01.1Outlays on Road and Land Construction and Improvement
- 01.2Outlays on Engineering and Related Technological work
- 01.3Outlays on Information Management

02 Outlays on Research and Development

- 02.1 Outlays on Research and Experimental Development on Natural Science and Engineering
- 02.2 Outlays on Research and Experimental Development on Social Science and Humanities

03 Outlays on Environmental Protection

- 03.1 Outlays on Protection of Ambient Air and Climate
- 03.2 Outlays on Waste Water Management
- 02.3 Outlays on Waste Management
- 03.4 Outlays Protection of Soil and Ground Water
- 03.5 Outlays on protection of Noise and Vibration Abatement
- 03.6 Outlays on protection of biodiversity and landscape
- 03.7 Outlays on Environmental protection n.e.c.

04 Outlays on Marketing

- 04.1 Outlays on Direct Sales Efforts
- 04.2 Outlays on Advertising
- 04.3 Outlays on Marketing n.e.c

05 Outlays on Human Resource Development

- 05.1 Outlays on Education and Training
- 05.2 Outlays on Health
- 05.3 Outlays on Social Services

06 Outlays on Current Production Programs, Administration and Management

- 06.1 Outlays on Current Production Programs
- 06.2 Outlays on External Transportation
- 06.3 Outlays on Safety and Security
- 06.4 Outlays on Management and Administration

Source: United Nations Statistics Division

Appendix XII:

SEEA Asset Classification

EA.1 Natural resources
EA.11 Mineral and energy resources
EA.111 Fossil fuels (cubic meters, tons, tons of oil equivalent, joules)
EA.112 Metallic minerals (tons)
EA.113 Non-metallic minerals (tons)

EA.12 Soil resources (cubic meters, tons) Not applicable
EA.121 Agricultural
EA.122 Non-agricultural

EA.13 Water resources (cubic meters)
EA.131 Surface water Not applicable
EA.132 Groundwater

EA.14 Biological resources
EA.141 Timber resources (cubic meters)
EA.142 Crop and plant resources, other than timber (cubic meters, tons, number)
EA.143 Aquatic resources (tons, number)
EA.144 Animal resources, other than aquatic (number)

EA.2 Land and surface water (hectares) of which, recreational land
EA.21 Land underlying buildings and structures

EA.211 In urban areas
EA.212 Outside urban areas

EA.22 Agricultural land and associated surface water
EA.221 Cultivated land
EA.222 Pasture land
EA.223 Other agricultural land

EA.23 Wooded land and associated surface water
EA.231 Forested land
EA.232 Other wooded land

EA.24 Major water bodies
EA.241 Lakes
EA.242 Rivers
EA.243 Wetlands
EA.244 Artificial reservoirs

EA.25 Other land (Part of AN.2119)
EA.251 Prairie and grassland
EA.252 Tundra
EA.253 Sparsely vegetated/barren land
EA.254 Permanent snow and ice

EA.3 Ecosystems [14, 15] Not applicable

EA.31 Terrestrial ecosystems

EA.311 Urban ecosystems
EA.312 Agricultural ecosystems
EA.313 Forest ecosystems
EA.314 Prairie and grassland ecosystems
EA.315 Tundra ecosystems
EA.316 Dry land ecosystems
EA.317 Other terrestrial ecosystems

EA.32 Aquatic ecosystems

EA.321 Marine ecosystems
EA.322 Coastal ecosystems
EA.323 Riverine ecosystems
EA.324 Lacustrine ecosystems
EA.325 Other aquatic ecosystems

EA.33 Atmospheric systems

EA.M Memorandum item: intangible environmental assets

EA.M1 Mineral exploration (AN.1121) Not applicable
EA.M2 Transferable licenses and concessions for the exploitation of natural resources
EA.M3 Tradable permits allowing the emission of residuals
EA.M4 Other intangible non-produced environmental assets

Source :United Nations Statistics Division

Appendix XIII:

Classification of Environmental Protection Activities and Expenditure (CEPA 2000)

1. Protection of ambient air and climate

- 1.1 Prevention of air pollution through in-process modifications
  - 1.1.1 For the protection of ambient air
  - 1.1.2 For the protection of climate and ozone layer
- 1.2 Treatment of exhaust gases and ventilation air
  - 1.2.1 For the protection of ambient air
  - 1.2.2 For the protection of climate and ozone layer
- 1.3 Measurement, control, laboratories and the like
- 1.4 Other activities

2. Waste-water management

- 2.1 Prevention of pollution through in-process modifications
- 2.2 Sewerage networks
- 2.3 Waste-water treatment
- 2.4 Treatment of cooling water
- 2.5 Measurement, control, laboratories and the like
- 2.6 Other activities

3. Waste management

- 3.1 Prevention of pollution through in-process modifications
- 3.2 Collection and transport
- 3.3 Treatment and disposal of hazardous waste
  - 3.3.1 Thermal treatment
  - 3.3.2 Landfill
  - 3.3.3 Other treatment and disposal
- 3.4 Treatment and disposal of non-hazardous waste
  - 3.4.1 Incineration
  - 3.4.2 Landfill
  - 3.4.3 Other treatment and disposal
- 3.5 Measurement, control, laboratories and the like
- 3.6 Other activities

4. Protection and remediation of soil, groundwater and surface water

- 4.1 Prevention of pollutant infiltration
- 4.2 Cleaning up of soil and water bodies
- 4.3 Protection of soil from erosion and other physical degradation
- 4.4 Prevention and remediation of soil salinity
- 4.5 Measurement, control, laboratories and the like
- 4.6 Other activities

5. Noise and vibration abatement (excluding workplace protection)

- 5.1 Preventive in-process modifications at the source
  - 5.1.1 Road and rail traffic
  - 5.1.2 Air traffic
  - 5.1.3 Industrial and other noise
- 5.2. Construction of anti-noise/anti-vibration facilities
  - 5.2.1 Road and rail traffic
  - 5.2.2 Air traffic

5.2.3 Industrial and other noise
5.3 Measurement, control, laboratories and the like
5.4 Other activities

6. Protection of biodiversity and landscape
6.1 Protection of species
6.2 Protection of natural and semi-natural landscapes
6.3 Measurement, control, laboratories and the like
6.4 Other activities

7. Protection against radiation (excluding external safety)
7.1 Protection of ambient media
7.2 Transport and treatment of high level radioactive waste
7.3 Measurement, control, laboratories and the like
7.4 Other activities

8. Research and development
8.1 Protection of ambient air and climate
8.1.1 Protection of ambient air
8.1.2 Protection of atmosphere and climate
8.2 Protection of water
8.3 Waste
8.4 Protection of soil and groundwater
8.5 Abatement of noise and vibration
8.6 Protection of species and habitats
8.7 Protection against radiation
8.8 Other research on the environment

9. Other environmental protection activities
9.1 General environmental administration and management
9.1.1 General administration, regulation and the like
9.1.2 Environmental management
9.2 Education, training and information
9.3 Activities leading to indivisible expenditure
9.4 Activities not elsewhere classified

Source: United Nations Statistics Division

Appendix XIV:

MDG Indicators

All indicators should be disaggregated by sex and urban/rural as far as possible.

Effective 15 January 2008

Millennium Development Goals (MDGs)	
Goals and Targets (from the Millennium Declaration)	**Indicators for monitoring progress**
Goal 1: Eradicate extreme poverty and hunger	
Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day	1.1 Proportion of population below $1 (PPP) per day[i] 1.2 Poverty gap ratio 1.3 Share of poorest quintile in national consumption
Target 1.B: Achieve full and productive employment and decent work for all, including women and young people	1.4 Growth rate of GDP per person employed 1.5 Employment-to-population ratio 1.6 Proportion of employed people living below $1 (PPP) per day 1.7 Proportion of own-account and contributing family workers in total employment
Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger	1.8 Prevalence of underweight children under-five years of age 1.9 Proportion of population below minimum level of dietary energy consumption
Goal 2: Achieve universal primary education	
Target 2.A: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	2.1 Net enrolment ratio in primary education 2.2 Proportion of pupils starting grade 1 who reach last grade of primary 2.3 Literacy rate of 15-24 year-olds, women and men
Goal 3: Promote gender equality and empower women	
Target 3.A: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015	3.1 Ratios of girls to boys in primary, secondary and tertiary education Share of women in wage employment in the non-agricultural sector 3.2 Proportion of seats held by women in national parliament
Goal 4: Reduce child mortality	
Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate	4.1 Under-five mortality rate Infant mortality rate 4.2 Proportion of 1 year-old children immunised against measles
Goal 5: Improve maternal health	
Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio	5.1 Maternal mortality ratio 5.2 Proportion of births attended by skilled health personnel
Target 5.B: Achieve, by 2015, universal access to reproductive health	5.3 Contraceptive prevalence rate 5.4 Adolescent birth rate 5.5 Antenatal care coverage (at least one visit and at least four visits) 5.6 Unmet need for family planning
Goal 6: Combat HIV/AIDS, malaria and other diseases	
Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS	6.1 HIV prevalence among population aged 15-24 years 6.2 Condom use at last high-risk sex 6.3 Proportion of population aged 15-24 years with comprehensive correct knowledge of HIV/AIDS 6.4 Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years

Millennium Development Goals (MDGs)	
Goals and Targets (from the Millennium Declaration)	**Indicators for monitoring progress**
Target 6.B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it	6.5 Proportion of population with advanced HIV infection with access to antiretroviral drugs
Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	6.6 Incidence and death rates associated with malaria 6.7 Proportion of children under 5 sleeping under insecticide-treated bednets 6.8 Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs 6.9 Incidence, prevalence and death rates associated with tuberculosis 6.10 Proportion of tuberculosis cases detected and cured under directly observed treatment short course
Goal 7: Ensure environmental sustainability	
Target 7.A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	7.1 Proportion of land area covered by forest 7.2 CO_2 emissions, total, per capita and per $1 GDP (PPP) 7.3 Consumption of ozone-depleting substances 7.4 Proportion of fish stocks within safe biological limits 7.5 Proportion of total water resources used 7.6 Proportion of terrestrial and marine areas protected 7.7 Proportion of species threatened with extinction
Target 7.C: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	7.8 Proportion of population using an improved drinking water source 7.9 Proportion of population using an improved sanitation facility
Target 7.D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers	7.10 Proportion of urban population living in slums[ii]
Goal 8: Develop a global partnership for development	
Target 8.A: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system Includes a commitment to good governance, development and poverty reduction – both nationally and internationally Target 8.B: Address the special needs of the least developed countries Includes: tariff and quota free access for the least developed countries' exports; enhanced programme of debt relief for heavily indebted poor countries (HIPC) and cancellation of official bilateral debt; and more generous ODA for countries committed to poverty reduction Target 8.C: Address the special needs of landlocked developing countries and small island developing States (through the Programme of Action for the Sustainable Development of Small Island Developing States and the outcome of the twenty-second special session of the General Assembly)	*Some of the indicators listed below are monitored separately for the least developed countries (LDCs), Africa, landlocked developing countries and small island developing States.* <u>Official development assistance (ODA)</u> 8.1 Net ODA, total and to the least developed countries, as percentage of OECD/DAC donors' gross national income 8.2 Proportion of total bilateral, sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation) 8.3 Proportion of bilateral official development assistance of OECD/DAC donors that is untied 8.4 ODA received in landlocked developing countries as a proportion of their gross national incomes 8.5 ODA received in small island developing States as a proportion of their gross national incomes <u>Market access</u> 8.6 Proportion of total developed country imports (by value and excluding arms) from developing countries and least developed countries, admitted free of duty 8.7 Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries 8.8 Agricultural support estimate for OECD countries as a percentage of their gross domestic product 8.9 Proportion of ODA provided to help build trade capacity

Millennium Development Goals (MDGs)	
Goals and Targets (from the Millennium Declaration)	**Indicators for monitoring progress**
Target 8.D: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term	Debt sustainability 8.10 Total number of countries that have reached their HIPC decision points and number that have reached their HIPC completion points (cumulative) 8.11 Debt relief committed under HIPC and MDRI Initiatives 8.12 Debt service as a percentage of exports of goods and services
Target 8.E: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries	8.13 Proportion of population with access to affordable essential drugs on a sustainable basis
Target 8.F: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications	8.14 Telephone lines per 100 population 8.15 Cellular subscribers per 100 population 8.16 Internet users per 100 population

The Millennium Development Goals and targets come from the Millennium Declaration, signed by 189 countries, including 147 heads of State and Government, in September 2000 (http://www.un.org/millennium/declaration/ares552e.htm) and from further agreement by member states at the 2005 World Summit (Resolution adopted by the General Assembly - A/RES/60/1, http://www.un.org/Docs/journal/asp/ws.asp?m=A/RES/60/1). The goals and targets are interrelated and should be seen as a whole. They represent a partnership between the developed countries and the developing countries "to create an environment – at the national and global levels alike – which is conducive to development and the elimination of poverty".

[i] For monitoring country poverty trends, indicators based on national poverty lines should be used, where available.

[ii] The actual proportion of people living in slums is measured by a proxy, represented by the urban population living in households with at least one of the four characteristics: (a) lack of access to improved water supply; (b) lack of access to improved sanitation; (c) overcrowding (3 or more persons per room); and (d) dwellings
made of non-durable material.

Source: Millennium Development Goals,2008

Appendix: XV

Glossary

Abiotic: non- living, e.g. rocks or minerals.

Abatement: technology applied or measure taken to reduce pollution and/or its impacts on the environment. The most commonly used technologies are scrubbers, noise mufflers, filters, incinerators, waste-water treatment facilities and composting of wastes.

Agenda 21: the plan of action to achieve sustainable development that was adopted by world leaders at the United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil, in June 1992.

Algae: simple non-vascular plants with unicellular organs of reproduction. Algae are found in fresh and salt water. They range from unicellular forms, usually microscopic, to multi cellular forms up to 30 m in length.

Afforestation: artificial establishment of forests by planting or seeding in an area of non-forest land.

Acidification: increase of hydrogen ions, usually expressed as the pH value of environmental media.

Airborne Disease: disease that is generally transmitted by nasopharyngeal discharges and by respiratory secretions, through coughing and sneezing, though it may also be conveyed through close contact. Respiratory diseases include the common childhood infections, measles, whooping cough, chickenpox, mumps, diphtheria and acute sore throat, as well as diseases of the respiratory tract, influenza and other acute viral infections, the pneumonias, and pulmonary tuberculosis (WHO, 1992).

Air Pollution: the presence of contaminant of pollutant substances in the air that do not disperse properly and that interferes with human health of welfare, or produces other harmful environmental effects.

Air Pollution Index (API) : quantitative measure that describes ambient air quality. The index is obtained by combining figures for various air pollutants into a single measurement.

Air Quality Standards: levels of air pollutants prescribed by regulations that may not be exceeded during a specified time in a defined area.

Air Pollutants: substances in air that could, at high enough concentrations, harm human beings, animals, vegetation or material. Air pollutants may thus include forms of matter of almost any natural or artificial composition capable of being airborne. They may consist of solid particles, liquid droplets or gases, or combinations of these forms. See also hazardous air pollutants.

Acid Precipitation / Rain: any form of precipitation (rain, snow, hail or fog) whose acidity has been increased through the uptake of acid pollutants from the air.

Alternate Energy: energy sources other than the traditional forest product and commercial energy items. They are: Direct Solar Insulation, Wind, Micro-hydro, Geothermal, Bio-gas plants.

Assets: Assets are entities that must be owned by some unit, or units, and which economic benefits are derived by their owner(s) by holding or using them over the period of time.

Ambient: surrounding, environmental.

Annual Average: average of concentrations measured over one year.

Annual Rainfall (mm): total rainfall in a year

Average Daily Sunshine Hours: average of daily sunshine hours measured over one year.

Acidity: acidity as applied to water is defined as the quantitative capacity of aqueous media to react with hydroxyl ions. The determination of acidity may provide an index of the severity of pollution or may indicate the probable behavior of water in treatment processes.

Alkalinity: the alkalinity of a solution may be defined as the capacity for solutes it contains to react with and neutralize acid. In water the alkalinity is produced by the dissolved carbon dioxide species, bicarbonate and carbonate. There are three types of alkalinity methyl-orange alkalinity, total alkalinity, and phenolphthalein alkalinity.

Ammonia: the term ammonia includes the non-ionized ammonia molecule and ionized ammonium ion species. Ammonia in water is an indicator of possible bacterial, sewage and animal waste pollution. No health related guidance value for drinking water has been set by WHO but concentration above 1.5 mg/l creates odour and taste problems.

Aquifer: underground geologic formation, or group of formation, containing ground water that can supply wells and springs.

Amphibians: class of cold-blooded vertebrates comprising frogs. They live both in water and on land. Most amphibians have to become temporarily aquatic for the purpose of reproduction.

Angiosperm: flowering plants, which produce one or more seeds enclosed in a fruit.

Bacteria: single- celled micro-organisms. Some are useful in pollution control because they break down the organic matter in water and land. Other bacteria may cause disease.

Baseline: The baseline (or reference) is any datum against which change is measured. It might be a current baseline in which case it presents observable present-day condition. It might also be a future baseline ,which is a projected future set of condition excluding the driving facer of interest Alternative interpretation of the reference conditions can give rise to multiple baseline.

Base Period: the period that provides the weights for an index is described as the base period

Biodiversity: the range of genetic differences, species difference and ecosystem difference in a given area.

Biomass: total living weight (generally in dry weight) of all living organisms in a particular area or habitat. It is sometimes expressed as weight per unit area of land or per unit volume of water.

Bryophytes: non-vascular and non-flowering plants comprising mosses and liverworts, widely distributed on moist soil and rocks.

Biological diversity: the variety of life forms: the different plants, animals and microorganisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecosystems diversity.

Biochemical Oxygen Demand (BOD): the biochemical oxygen demand is the mass of dissolved molecular oxygen, which is needed by micro organisms for the aerobic oxidation of organic substances to CO_2 and water. Generally in water analysis BOD is determined at 20oc with 5 days incubation period. It depends on the amount of organic

substances present in water and is useful in expressing stream pollution load. Generally, effluents having BOD value greater than 4 mg/l are not allowed to be discharged into water courses.

Bio-gas: mixture of methane and carbon dioxide in the ratio of 7:3 that is produced by the treatment of animal dung, industrial wastes and crop residues. It is used as an alternative source of energy.

Biogeography: the scientific study of the geographic distribution of organisms.

Biota: All the organisms, including animals, plants, fungi and microorganisms in a given area.

Chromosome: body found in the nucleus of living cells, composed mainly of DNA and protein, in a linear sequence of genes, Exchange of genes during sexual reproduction is facilitated by splitting of chromosomes during fertilization.

Carbon Dioxide (CO_2): It is a chemical compound consisting of one atom of carbon and two atoms of oxygen. A colorless, odorless, non-poisonous gas, which results from fossil fuel combustion and burning of materials, and is normally a part of ambient air.

Carbon Monoxide (CO): It is a chemical compound consisting of one atom of carbon and one atom of oxygen. It is a colorless and odorless gas formed whenever carbon or substances containing carbon are burned with an insufficient air supply (incomplete fuel combustion). It is poisonous to all warm-blooded animals and to many other forms of life. Automobile - exhaust gases contain harmful quantities of carbon monoxide.

Catchments Area: area from which rainwater drains into river system, lakes and seas.

Climate: Climate in a narrow sense is usually defined as the average weather or more rigorously as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of millions of years. These quantities are most often surface variables such as temperature, precipitation and wind. Climate in a wider sense is the state including a statistical description of the climate system. The classical period of time is 30 years, as defined the World Meteorological (WMO).

Climate change: Climate change refers to a change in the state of the climate that can be identified (e.g. using statistical test) by changed in the mean and /or the variability of its properties, and that persists or extended period, typically decades or longer. Climate change may be due to natural internal processes of external forcing, or to persistent anthropogenic change in the composition of the atmosphere or in land use.

Community Soil: It is a practice of managing the conservation of soil erosion or soil quality by community participation.

Consumption: consumption is an activity in which institutional units use up goods or service, consumption can be either intermediate or final

Chloro-fluorocarbons (CFCs): inert, non-toxic and easily liquefied chemicals used in refrigeration, air-conditioning, packaging and insulation or as solvents and aerosol propellants. Because CFCs are not destroyed in the lower atmosphere, they drift into the upper atmosphere where their chlorine components destroy ozone. They are also among the greenhouse gases that may affect climate change. See also aerosol propellant.

Chemical Oxygen Demand (COD): chemical oxygen demand (COD) is used as a measure of the oxygen equivalent of the organic matter content of a sample that is susceptible to oxidation by a strong chemical oxidant. It is a measure of the total amount of oxygen required for oxidation of waste to CO_2 and water and is used to determine pollution or oxidizable material loads quickly.

Coliform: coli form organisms are defined as Gram-negative, rod-shaped, non- sporing bacteria capable of growing in the presence of bile salts or other surface - active agents and of fermenting lactose within 48 hours at 35-37^{o}C. This group of bacteria includes organisms originating from intestinal tract of warm-blooded animals and also from soil and vegetation. Its presence in water indicates probable contamination from human waste. Recent health related WHO guideline value for drinking water does not permit the presence of even a single coliform bacterium in drinking water.

Color: the term color is used to mean true color, that is, the color of water from which turbidity has been removed. Color in water may result from the presence of natural metallic ions (iron & manganese) humus and peat materials, plankton, weeds, and industrial wastes.

Dicotyledon: flowering plants with two seed leaves in embryo plant. Includes many forest and fruit trees, food plants and ornamentals.

Decibel (dB): unit of sound measurement on a logarithmic scale, with sound approximately doubling in loudness for every increase of 10 decibels.

Dust: particles light enough to be suspended in air.

Deforestation: clearing of tree formations and their replacement by non-forest land uses.

DNA: deoxyribonucleic acid, chief constituent of chromosomes.

DNA (deoxyribonucleic acid): fhe genetic material of most living organisms, which is a major constituent of the chromosomes within the cell nucleus and plays a central role in the determination of hereditary characteristics by controlling protein synthesis in cells.

Degraded Land (natural): land deteriorated through a reduction in soil depth or quality as a result of water or wind erosion, landslides or water logging etc. This excludes land in the process of desertification.

Degraded Land (man made): this refers to the land deteriorated through a reduction in soil depth or quality as a result of deforestation, de-vegetation faulty irrigation system, excessive chemical fertilizers in localized area, unwise use of marginal land, road building in the hills etc. This also excluded land in the process of desertification.

Denudation: 1. erosion by rain, frost, wind or water of the solid matter of the earth. The term often implies the removal of soil down to the bedrock; 2. Removal, by natural or artificial means, of all vegetation and organic matter.

Depletion (in natural resource accounting): for renewable resources, the part of the harvest, logging, catch and so forth above the sustainable level of the resource stock; for non-renewable resources, the quantity of resources extracted. In the SNA it is defined as the reduction in value of deposits of subsoil assets, natural forests, fish stocks in the open seas and other non-cultivated biological resources as a result of the physical removal and using up of the assets.

Drop Out Rate: the percent of children entering a level of education who do not successfully complete that level in due course.

Domestic Output: domestic output is output produced by residence enterprises.

Dissolved Oxygen (DO): dissolved oxygen is an important parameter of water quality. The water when comes in contact with air dissolves oxygen depending on, or according to atmospheric pressure, the temperature, and the content of dissolved salts. Its presence is essential to maintain the higher forms of biological life and the effect of a waste discharged on a river is largely determined by the oxygen balance of the system. Aquatic animals require certain amounts of DO depending upon their species, stage of development, level of activity and the water temperature.

Domestic Waste: domestic waste consists of solid and liquid wastes originating from residential, commercial and institutional buildings. These are both biodegradable and non-biodegradable.

Environment: the totality of all the external conditions affecting the life, development and survival of an organism.

Environmental Assets: all natural assets which are not economic assets. Environmental assets are non-produced natural assets that do not function as providers of natural resource inputs into production but as providers of environmental services of waste absorption, ecological functions such as habitat or flood and climate control, and other non-economic amenities such as health and aesthetical values. See natural assets.

Environmental Costs: cost connected with the actual or potential deterioration of natural assets due to economic activities. Such costs can be viewed from two different perspectives, namely as (a) costs caused, that is, costs associated with economic units actually or potentially causing environmental deterioration by their own activities or as (b) costs borne, that is, costs incurred by economic units independently of whether they have actually caused the environmental impacts.

Environmental Expenditures: capital and current expenditures related to characteristic activities and facilities specified in classifications of environmental protection activities.

Environmental Impact: direct effect of socio-economic activities and natural events on the components of the environment.

Environmental Impact Assessment (EIA): analytical process that systematically examines the possible environmental consequences of the implementation of projects, programmes and policies.

Environmental Indicator: parameter, or a value derived from parameters that points to, provides information about and/or describes the state of the environment, and has a significance extending beyond that directly associated with any given parametric value. The term may encompass indicators of environmental pressures, conditions and responses (OECD, 1994).

Environmental Media: abiotic components of the natural environment, namely, air, water and land.

Environmental Protection: any activity to maintain or restore the quality of environmental media through preventing the emission of pollutants or reducing the presence of polluting substances in environmental media.

Environmental taxes: a tax whose tax base is in physical unit (or a proxy of it) that has a proven negative impact on the environment.

Environmental Statistics: statistics that describe the state and trends of the environment, covering the media of the natural environment (air/climate, water, land/soil) the biota within the media and human settlement. Environment statistics are integrative in nature, measuring human activities and natural events that affect the environment, the impacts of these activities and events, social responses to environment impacts and the quality and availability of natural assets. Broad definition includes environmental indicators, indices and accounting.

Environmental Accounting: the term usually refers to environment auditing, but may also include the costing of environmental impacts caused by the corporation.

Ecology: totality or pattern of relationships between organisms and their environment.

Exotic: species introduced from one locality to another locality.

Ecosystem: a dynamic complex of plant, animal, fungal and microorganism communities unit.

Ecological processes: which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy, and biodiversity (as an expression of the process of evolution).

Emission: discharge of pollutants into the atmosphere from stationary sources such as smokestacks, other vents, surface areas of commercial or industrial facilities and mobile sources, for example, motor vehicles, locomotives and aircraft.

Endemic Disease: disease that is only, or regularly, found among a specified population or in a specified locality.

Effluent: liquid waste product (whether treated or untreated) discharged from an industrial process or human activity that is discharged into the environment.

Eutrophication: when water bodies like lakes, reservoirs streams, & estuaries receive effluents rich in nutrients (phosphorous and nitrogen) growth of water plants (algae) is stimulated as a result of which deoxygenating of the water, major ecological changes, increase in turbidity, increase in rate of sedimentation occur. An insidious form of water pollution that causes progressive deterioration of water resources on a wide
scale by the overabundance of plant life as a result of over enrichment with the nutrients is known as Eutrophication.

Earthquake: sudden shaking or trembling of the earth caused by faulting or volcanic activity.

Ecoregion / eco-zone: homogeneous area of one or more ecosystems that interact with relatively self-contained human activities.

Erosion: wearing away of the land by running water, rainfall, wind, ice or other geological agents, including such processes as detachment, entrainment, suspension, transportation and mass movement. Geologically, erosion is defined as the process that slowly shapes hillsides, allowing the formation of soil cover from the weathering of rocks and from alluvial and colluvial deposits. Erosion is often intensified by land-clearing human activities related to farming, resident and industrial development and it has as effect increasing run-offs, decline of arable layers, siltation in lakes, lagoons and oceans.

Environmental Disease: disease that is, at least in part, caused or aggravated by living conditions, climate and water supply or other environmental conditions. Environmental factors that may affect health include psychological, biological, physical and accident-related factors. Environmental diseases include in particular communicable diseases, such as respiratory diseases, and vector-borne diseases such as malaria, schistosomiasis and onchocerciasis. See also airborne disease and waterborne disease.

Epidemic: widespread outbreak of a disease that affects a large number of individuals at a particular time.

Enrollment Ratio (gross): the ratio of the number of students, regardless of age, enrolled at a particular level of education to population of specified age.

Enrollment Ratio (net): the ratio of the number of students specified age enrolled in a level of education to total population of that age for the level.

Endangered: plant and animal species which are under threat and likely to become extinct if casual factors continue operating. They may be abundant over their range but are endangered because of such factors as habitat deterioration, trade or the onset of disease.

Endemic: plants or animals prevalent in or peculiar to a particular locality, region or people.

Extinct Species: the endangered or threatened plant and animal species lost for ever because of their habitat being destroyed through a change in land use or some use for them resulted in mass slaughter/over use or export.

Family: a taxonomic group of genera, which have certain characteristics in common.

Fauna: all of the animals found in a given area.

Flora: all of the plants found in a given area.

Fungi: simple plants including moulds and mushrooms with thread like cells and without green chlorophyll. Fungi have no roots, stem, or leaves like flowering plants and ferns.

Forested Land: these are areas of forest vegetation, having at least of ten percent crown covers, which also includes small pockets of plantation and burned areas.

Faecal Coliform: faucal coli forms are that part of the coli form group which is present in the intestines and faeces of warm-blooded animals. These bacteria are capable of producing gas from lactose and form blue colonies within 24 hours when incubated at $44.5^{o}C \pm 0.2^{o}C$ on M-FC medium. It should be nil in potable water according to WHO guideline.

Global Warming: phenomenon believed to occur as a result of the build-up of carbon dioxide and other greenhouse gases. It has been identified by many scientists as a major global environmental threat. See also greenhouse effect.

Gross Domestic Product (GDP): gross domestic product is a measure of net aggregate of the total value of output produced within the boundary of a country or territory in a specified period of time.

Greenhouse Effect: warming of the earth's atmosphere caused by a build-up of carbon dioxide and other greenhouse or trace gases that act like a pane of glass in a greenhouse, allowing sunlight to pass through and heat the earth but preventing a counterbalancing loss of heat radiation.

Genus (genera). a category used in the classification of organisms that consists of a number of closely related species.

Gene: hereditary factor, transmitted from generation to generation of plants and animals, that is responsible for the determination of a particular characteristic, for example, color, height or sex.

Gymnosperm: Plants that have naked seeds, which form an intermediate group between the cryptogams and the angiosperms. Examples: cicadas and conifers. They are primitive seed plants with many fossil representatives.

Gross National Product (GNP): gross national product is the sum of GDP and net factor income from abroad.

Gross Saving: gross saving is gross disposable income less final consumption expenditure

Green GDP: popular term for environmentally adjusted gross domestic product. See also environmentally adjusted net domestic product.

Herbs: plant with soft stem that dies down to the ground after each season's growth, as distinguished from shrubs and trees. Also any plant used as a medicine or seasoning, e.g. thyme, surpentine.

Herbarium Identification: collection of preserved plant specimens for scientific study or research and reference purposes.

Hydroxyl Ion: a hydroxyl ion consists of one atom of hydrogen and one atom of oxygen and carries one unit of negative charge.

Habitat: the place type of site where an organism naturally occurs.

Human Settlements: integrative concept that comprises (a) physical components of shelter and infrastructure and (b) services to which the physical elements provide support, that is to say, community services such as education, health, culture, welfare, recreation and nutrition.

Hardness: this is the property of water, which prevents lather formation with soap and produces scale in pipelines. It is due mainly to dissolved calcium and magnesium ions. Carbonate hardness (temporary hardness) is due to the presence of these metals associated with bicarbonate while non-carbonate hardness (permanent hardness) is due to the presence of these metals associated with sulphate/chloride or nitrate.

Hazardous Waste: hazardous wastes include toxic chemicals, biological and medical wastes, flammable wastes, corrosive wastes, radioactive wastes, and explosives. They usually are produced in industrial operations or in technical institutions.

Hazen: the Hazen scale, which is also known as platinum-cobalt units, is generally used in the determination of color in water samples

Hydrological cycle: water cycle, involving the exchange of water between the atmosphere, water-bodies, the Earth's crust and living organisms. Operates on a global to microcosm level.

Homology: the condition of being homologous. Homologous refers to organs of structures deriving from the same evolutionary origins. For example, the forelimb of a quadruped, the human arm and the wing of a bird are said to be homologous.

Industrial Wastes: solid, liquid and gaseous wastes originating from the manufacture of specific products.

Infant Mortality Rate: the annual number of deaths of infants under one year of age per 1000 live births during a year.

Incinerator: furnace for burning wastes under controlled conditions.

Lichens: species formed from the symbiotic association of algae and fungi. Commonly occur on tree - trunks, old walls, on the ground, exposed rocks. They are the primary colonizers of bare areas.

Landslide: downward mass movement of earth or rock on unstable slopes.

Land Use / Classification: land categories, reflecting quality classes, capability classes or grade, depending upon the characteristics of the land and/or its potential for agricultural use.

Land Degradation: reduction or loss of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest or woodlands resulting from natural processes, land uses or other human activities and habitation patterns such as land contamination, soil erosion and the destruction of the vegetation cover.

Land Affected by Desertification (man made): the area of land which is in the degrading process by the removal of forest vegetation, grassland vegetation and other natural resources.

Lead (Pb): a heavy metal whose compounds are highly poisonous to health. It is used enormous quantities in storage batteries, paints, sheathing electric cables, lining pipes etc. Lead compound is the chief constituent of gasoline and is considered a significant contributor to air pollution.

Life Expectancy at Birth: the expected number of years for a new born baby would live if prevailing patterns of mortality at the time of its birth would remain the same throughout its life.

Labour Force Participation: the ratio of population who are employed and seeking employment in the age group 15-64 to total population in working age.

Literacy Rate: percent literate population 6 years and above. " Literate Person " is the one who can read and write with understanding simple notes of every day life

Monocotyledons: flowering plants having single seed leaf (cotyledon) in the seed.

Major Anions: anions generally found in significant concentrations in natural waters are known as major anions. These include ions of carbonate, bicarbonate, sulphate, and chloride.

Major Cations: cations generally found in significant concentrations in natural waters are known as major cations. These include ions of calcium, magnesium, sodium, and potassium.

Methane (CH_4): colorless and odorless gas composed of one atom of carbon and four atoms of hydrogen. It is non-poisonous and flammable gaseous hydrocarbon created by anaerobic decomposition of organic compounds. It occurs in natural gas, as fire damp in coal mines, and as a product of decomposition in swamps.

Mercury: heavy metal that can accumulate in the environment and is highly toxic if breathed or swallowed.

Monthly Average Wind Speed (km/hr): average of the daily wind speed in a month.

Monthly Mean Temperature: it is the mean temperature of the month calculated from all daily means of months, where daily mean temperature is the average mean of maximum and minimum temperature in a day.

Monthly Rainfall (mm): total rainfall in each month of a year.

Maternal mortality Rate: the annual number of deaths of women from pregnancy related causes per 1,00,000 live births.

National Park: A legally established area for the conservation, management and utilization of flora and fauna, and landscape, together with natural environment.

Nutrient: substance, element or compound necessary for the growth and development of plants and animals.

National Accounting: physical and monetary accounts of environmental assets and the costs of their depletion and degradation;

Natural Resources: natural assets (raw materials) occurring in nature that can be used for economic production or consumption. See also renewable natural resources and non-renewable natural resources.

Nitrogen Oxides (Nox): these are compounds of nitrogen and oxygen combined in various ratios. The major human-caused source of NO_2 is fuel combustion in motor vehicles, utility and industrial boilers. The gas is toxic in high

concentrations, a lung irritant and lowering resistance to respiratory infection. It is a major contributor to acid deposition and the formation of ground level ozone in troposphere.

Natural Disaster: sudden calamitous such as earthquakes, tsunamis, floods, volcanic eruptions, cyclones and landslide, of ongoing misfortune as in conditions of processes such as drought and desertification.

Noise: audible sound from traffic, construction and so on that may generate unpleasant and harmful effects (hearing loss). It is measured in decibels.

Noramal: The name given to the average value over a period of years of any meteorological element such as pressure, temperature, rainfall, ete. World Meteorological Organization defined the average period as 30 years.Currently 1971-2000 is as the normal period.

Noise Pollution: sound of excessive levels that may be detrimental to human health.

Nutrients: Nutrients include phosphorous, nitrogen, carbon, and silica in their various chemical forms. The degree of eutrophication in lakes is dependent largely on nutrient concentrations in the lake waters.

Nitrates: already cover in Water Resources component. In the context of soil, it is nitrogenous fertilizer in the form of nitrate.

N.P.K. Content in Soil: N.P.K. stands for nitrogen, phosphorous and potassium compounds, which are also called nutrients as these compounds are essential for growing crops and, hence, are added to soil in the form of fertilizers.

Ozone (O_3): pungent, colorless, toxic gas that contains three atoms of oxygen in each molecule. It occurs naturally at a concentration of about 0.01 parts per million (p.p.m.) of air. Levels of 0.1 p.p.m. are considered to be toxic. In the stratosphere, ozone provides a protective layer shielding the earth from the harmful effects of ultraviolet radiation on human beings and other biota. In the troposphere, it is a major component of photochemical smog, which seriously affects the human respiratory system.

Other Lands: this refers to his land type which is catch-all for other uses of land and may include rocky areas, lakes, ponds, water ways or settlements etc.

Ozone Depletion: destruction of ozone in the stratosphere, where it shields the earth from harmful ultraviolet radiation. Its destruction is caused by chemical reactions in which oxides of hydrogen, nitrogen, chlorine and bromine act as catalysts.

Organism: any living plant, animal or human being.

Organic Constituents: there are the substances found in water which have originated from organic sources or which have organic nature (e.g. hydrocarbons, pesticides etc.).

Pesticide: any substance or mixture of substances that is used to prevent, destroy or control pests - including vectors of human or animal disease, and unwanted species of plants or animals. Pesticides may cause harm during, or otherwise interfere with, the production, processing, storage, transport or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs - or that may be administered to animals so as to control insects, arachnids or other pests in or on their bodies.

Popualtion-land ratio : a measure to express population pressure on land i.e. population divided by land area (sq. km.).

Protected Area: a legally established area for achieving specific conservation objectives.

Pteridophytes: non-flowering vascular plants with root stem and leave e.g. ferns, horsetails. Widely distributed group attaining its development in the tropics.

Peak Daily Average: the highest 24-hour (daily) average concentration level of average daily concentration levels measured over one year.

Peak 1-Hour Average: the highest one-hour average concentration of all one-hour average concentrations monitored for one year.

Peak 8-Hour Average: The highest 8-hour average of all 8-hour average concentrations measured over one year. p.p.m./p.p.b./p.p.t. (parts per million/parts per billion/parts per trillion), measures of the concentrations of pollutants in air, water, soil, human tissue, food or other products.

pH Value: measure of the acidity or alkalinity of a liquid. A pH value in the range of 0 to 7 indicates acidity, a pH value in the range of 7 to 14 indicates alkalinity, and a pH value of 7 signifies neutrality.

Pollutant: substance that is present in concentrations that may harm organisms (humans, plants and animals) or exceed an environmental quality standard.

Pollution: 1. presence of substances and heat in environmental media (air, water, land) whose nature, location, or quantity produces undesirable environmental effects; 2. activity that generates pollutants.

pH: It is used as a measuring unit of the intensity of acidity or alkalinity of a sample. In other words, the pH is defined as the negative logarithm of molar hydrogen-ion activity or hydrogen-ion concentration (in dilute solutions).

Population Density: total number of inhabitants per square unit of surface area.

Price: The price of a goods or service is the value of one unit of a particular goods or service.

Production: Production is a physical process, carried out under the responsibility, control and management of an institutional unit, in which labour and assets are used to transform inputs of goods and service into output of other goods and service.

Potable Water: water that is safe for drinking and cooking according to defined standards.

Pollution Abatement: technology applied or measure taken to reduce pollution and/or its impacts on the environment. The most commonly used technologies are scrubbers, noise mufflers, filters, incinerators, waste-water treatment facilities and composting of wastes.

Recombination: the rearrangement of genes that occurs when reproductive cells

Red Data Book: a document containing information on threatened, rare or endangered species in a given habitat.

Residual: amount of a pollutant that remains in the environment after a natural or technological process has taken place.

Richter Scale: scale with a range extending from 0 to 10 for measuring the strength of an earthquake.

Rare Species: species occurring in small populations throughout its range. They are sparsely distributed over a large area. They may be endangered or threatened with extinction if their regeneration or reproduction is slow.

Relative Humidity: It is defined as a ratio of actual water vapor pressure to the saturation vapor pressure and is expressed in percentage. It is the measure of the water vapor content in the air.

Sustainable Development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). It assumes the conservation of natural assets for future growth and development

System of integrated Environmental and Economic Accounting (SEEA): satellite system of the System of National Accounts (SNA) proposed by the United Nations (1993a) for the incorporation of environment concerns (environmental costs, benefits and assets) into national accounts.

Shrub: low, perennial woody plants with several permanent stems branching from or near ground rather than single trunk, usually less than 6 m high at maturity.

Selection: natural selection is the differential contribution of offspring to the next generation by various genetic types belonging to the same populations.

Species: a group of organisms capable of interbreeding freely with each other but not with members of other species.

Sanitation: improvement of environmental conditions in households that affect human health by means of drainage and disposal of sewage and refuse.

Sewage: organic wastes and wastes water produce by residential and commercial establishments.

Sulphate (SO_4): sulphate ion consists of one atom of sulphur and four atoms of oxygen and carries two negative charge. Sulphur dioxide in the atmosphere ultimately gets converted into sulphate particles, and it combines with moisture in the air to form sulphuric acid (precursor to acid rain).

Sulphur Dioxide (SO_2): A heavy, pungent with suffocating odour, colourless gas formed primarily by the combustion of fossil fuels such as gas, petroleum and coal. It constitutes one of the most troublesome air pollutants. In moist air it is slowly oxidized to sulphuric acid. It is harmful to human beings and vegetation and contributes to acidity in rain. It may be responsible for the decay of buildings and monuments.

Suspended Solid Particles or Suspended Particulate Matter: It consists of particles of a wide range of sizes varying from greater than 100 m to less than 0.1 m. Particles larger than 10 m mainly consists of dust, coarse dirt and fly ashes which settle rapidly. Small particles less than 10 m remain much longer in the air as Suspended Particulate Matter (SPM). Human - caused sources include a variety of combustion sources (vehicles, dryers), wood stoves, field burning, and dusts from mining, roads and construction. It causes breathing and respiratory symptoms (diseases) and premature mortality. Other effects are soiling and corrosion of building materials.

Soil pH: Already covered in Water Resources component. pH is measured in the aqueous extract of the soil.

Sodium Absorption Ratio (SAR) Component: Already covered in Water Resources.

Solid Waste: useless and sometimes hazardous material with low liquid content. Solid wastes include municipal garbage, industrial and commercial waste, sewage sludge, wastes resulting from agricultural and animal husbandry operations and other connected activities, demolition wastes and mining residues.

Solid Waste Disposal: ultimate disposition or placement of refuse that is not salvaged or recycled.

Saving: saving is a disposal income less final consumption expenditure (or adjusted disposable income less actual final consumption **)**

Solid Waste Management: supervised handling of waste material from generation at the source through the recovery processes to disposal.

Tolerance: 1. ability of an organism to endure unfavorable environmental conditions; 2. amount of a chemical in food considered safe for humans or animals.

Threatened: species having low fecundity (offspring production rate) or prone to extinction in human-dominated landscapes.

Toxic Substances: substances, which cause adverse effects on living organisms (e. g. pesticides, arsenic, mercury etc.)

Traffic Density: number of vehicles per km of road length in a given area..

Total Fertility Rate: the average number of children that would be born alive to a woman during her life time if she were to bear children at each age in accordance with prevailing age-specific fertility rate.

Turbidity: the presence of suspended and /or colloidal substance give liquid a cloudy appearance, which is, knows as turbidity. No health based guidance value for turbidity has been proposed but it makes the water unattractive and possibly harmful.

Taxon (pl.taxa): the named classification unit to which individuals, or sets of species, are assigned, such as species, genus, order etc.

Value added tax (VAT): a value added tax (VAT) is a tax on products collected in spot by enterprises

Vulnerable Species: taxa of various types, including (a) taxa believed likely to move into the "endangered" category in the near future if the relevant causal factors continue to operate. These factors may include overexploitation, extensive destruction of habitat and other environmental disturbances, (b) taxa with populations that have been seriously depleted and whose ultimate security has not yet been assured and (c) taxa with populations that are still abundant but are under threat from severe adverse factors throughout their range.

Weather: day-to-day or sometimes even instantaneous changes of atmospheric conditions over a given place or area. In contrast, climate encompasses the statistical ensemble of all weather conditions during a long period of time over that place or area. Atmospheric conditions are measured by the meteorological parameters of air temperature, barometric pressure, wind velocity, humidity, clouds and precipitation.

Waste-water Treatment: process to render waste water fit to meet environmental standards or other quality norms. Three broad types of treatment may be distinguished.

Water Quality: physical, chemical, biological and organoleptic (taste-related) properties of water.

Water Quality Index: weighted average of selected ambient concentrations of pollutants usually linked to water quality classes.

Wetland: area of low-lying land where the water table is at or near the surface most of the time. Wetlands include swamps, bogs, fens, marshes and estuaries.

Zero Population Growth (ZPG): absence of population growth in which equal birth and death rates create a stable human population.

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