Nepal

Poverty Reduction through Sustainable Management of Protected Areas and Wetlands in Nepal: Processes, Modalities, Impacts and Identification of Areas for Future Support

Volume I: Main Report

March 2004

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Abbreviations

ACA	Annapurna Conservation Area
ACAP	Annapurna Conservation Area Project
amsl	Above mean sea level
AsDB	Asian Development Bank
BCC	Biodiversity Conservation Centre
BCN	Brahmin, Chhetri, Newar
BCP	Bardia Conservation Project
BICP	Bardia Integrated Conservation Project
BIP	Banaganga Irrigation Project
BIS	Banaganga Irrigation System
BPP	Biodiversity Profile Project
BRP	Bardia Research Project
BTCC	Bish Hazar Tal Conservation sub Committee
BTRS	Bishazari Tal Ramsar Site
BZ	Buffer Zone
BZDP	Buffer Zone Development Program
BZMC	Buffer Zone Management Committee
BZMP	Buffer Zone Management Project
BZUC/s	Buffer Zone User Committee/s
BZUGs	Buffer Zone User Groups
CA	Conservation Area
CAMC/s	Conservation Area Management Committee/s
CBD	Convention on Biological Diversity
CBO/s	Community Based Organization/s
CBS	Central Bureau of Statistic, Nepal
CF/s	Community Forest/s
CFUG/s	Community Forest User Group/s
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
DADO	District Agriculture Development Office/r
DAGs	Disadvantaged Groups
DANIDA	Danish International Development Agency
DDC	District Development Committee
DFID	Department for International Development, United Kingdoms
DFO	District Forest Office
DHR	Dhorpatan Hunting Reserve
DLSO	District Livestock Office/r
DNPWC	Department of National Parks and Wildlife Conservation
DOF	Department of Forest
DOI	Department of Irrigation
DSCO	District Soil Conservation Office/Officer
DSCWM	Department of Soil Conservation and Watershed Management
E – W	East – West
EIA	Environment Impact Assessment
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GACAF	Ghodaghodi Area Conservation and Awareness Forum
GEF	Global Environment Facility
GKSTBS	*Ghodaghodi Kshetra Samrakshan tatha Bikas Samiti*
GTF	Global Tiger Forum
GTRS	Ghodaghodi Tal Ramsar Site
ha	hectare
HDI	Human Development Index
HH/s	Households

HMG/N	His Majesty Government of Nepal
HR	Hunting Reserve
ICDP	Integrated Conservation and Development Project/Programme
ICIMOD	International Centre for Integrated Mountain Development
ICS	Improve Cooking Stove
IDD	Irrigation Development Division
IEE	Initial Environmental Examination
IGA/s	Income Generating Activity/ies
INGOs	International Non-Government Organizations
IUCN	World Conservation Union
JICA	Japan International Cooperation Agency
JRRS	Jagadishpur Reservoir Ramsar Site
KCA	Kangchenjungha Conservation Area
KCAP	Kangchenjungha Conservation Area Project
KCCI	Kailali Chamber of Commerce and Industry
Km	Kilometre
KMTNC	King Mahendra Trust for Nature Conservation
KNP	Khaptad National Park
KWR	Koshitappu Wildlife Reserve
LA	Line Agencies
LDO	Local Development Office/r
LGOs	Local Government Organization(s)
LNP	Langtang National Park
LSGA	Local Self-Governance Act
MAPs	Medicinal and Aromatic Plants
MBNP	Makalu Barun National Park
MCA	Manaslu Conservation Area
MCAP	Manaslu Conservation Area Project
MEDP	Manaslu Ecotourism Development Project
MIS	Management Information System
MoAC	Ministry of Agriculture and Cooperatives
MoFSC	Ministry of Forests and Soil Conservation
MoLD	Ministry of Local Development
MoTCA	Ministry of Tourism and Civil Aviation
MPFS	Master Plan for Forestry Sector Nepal
MWDR	Mid Western Development Region
NAF	Nepal Agroforestry Foundation
NARMA	Centre for Natural Resources Management, Analysis, Training and Policy Research Private Limited
NBS	Nepal Biodiversity Strategy
NBSIP	National Biodiversity Strategy Implementation Plan
NCS	National Conservation Strategy for Nepal
NEPAP	Nepal Environment Policy Action Plan
NGO/s	Non-Government Organization/s
NMCP	Northern Mountain Conservation Programme
NORAD	Norwegian Agency for Development
NPC	National Planning Commission
NPWCA	National Parks and Wildlife Conservation Act
NTFB	Nepal Trust Fund for Biodiversity
NTFPs	Non Timber Forest Product/s
NUG	Non User Group
NWP	National Wetland Policy
PA/s	Protected Areas
PCP	Participatory Conservation Programme
PDI	Poverty Deprivation Index

POWER	Poor People, Occupational caste and Women's Empowerment for Resource management Program
PPP	Park People Programme
PWR	Parsa Wildlife Reserve
RBNP	Royal Bardia National Park
RCNP	Royal Chitwan National Park
RHS	Rice Husk Stove
RNA	Royal Nepal Army
RNP	Rara National Park
Rs	Rupees
RSWR	Royal Shuklaphanta Wildlife Reserve
SABIHAA	*Samudaayik Bikaas Tathaa Hariyaali Aayojanaa*
SALOGC	Significance, Achievement, Lesson learned, Obstacle, Gap and Commitment
SCAFP	Sagarmatha Community Agro-Forestry Project
ShNP	Shivapuri National Park
SIWDP	Shivapuri Integrated Watershed Development Project
SNP	Sagarmatha National Park
SNV	The Netherlands Cooperation Agency
SPNP	Shey Phoksundo National Park
STG	Special Target Group
SWCA	Soil and Water Conservation Act
SWOT	Strength, Weakness, Opportunity and Threat
SWWR	Shivapuri Watershed and Wildlife Reserve
TAL	Tarai Arc Landscape Programme
TAR	Tibetan Autonomous Region
TEVT	Technical, Educational and Vocational Training
TMI	The Mountain Institute
ToR	Terms of Reference
TRCP	Tiger Rhino Conservation Project
TRPAP	Tourism for Rural Poverty Alleviation Program
UCs	User Committee/s
UGs	User Group/s
UMBCP	Upper Mustang Biodiversity Conservation Project
UN	United Nations
UNDP	United Nations Development Program
UNF	United Nations Fund
US	United States
USAID	United States Agency for International Development
VDCs	Village Development Committee/s
WCC	Ward Conservation Committee
WHC	World Heritage Convention
WHS	World Heritage Site
WRs	Wildlife Reserves
WS/s	Wetland Site/s
WUA	Water User Association
WWF	World Wildlife Fund

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Executive Summary

Japan International Co-operation Agency (JICA) Nepal Office commissioned this study to conduct a comprehensive review analysis of biodiversity status in protected areas and wetlands of Nepal and identify feasible areas of Japan Nepal future co-operation in promoting participatory biodiversity conservation and poverty reduction. Centre for Natural Resources Management, Analysis, Training and Policy Research initiated this study on 3rd November 2003 and completed on 31 March 2004. This study is based on the review analysis of available secondary information in reports, documents and official records of concerned government, semi-government, non-government and private organisations including international conservation partners and is supplemented by field data collected during field study. Field study covered three priority protected areas and three priority wetlands selected using a set of criteria reflecting priorities of His Majesty's Government of Nepal and JICA. In each field study site, 10 stakeholders were covered. From each of the selected protected areas and wetland sites, 50 households affiliated to user groups and 10 households not affiliated to user groups were selected and interviewed.

Systematic efforts towards biodiversity conservation in Nepal began in 1973 with the enactment of National Parks and Wildlife Conservation Act 1973 PWCA, 1973. The Act empowered the government to establish protected areas and buffer zones with four boundaries in any part of the kingdom through a gazette notification. The Act has been amended four times and is supported by nine different regulations. Since its enactment, nine national parks, three wildlife reserves, one hunting reserve and three conservation areas and six buffer zones covering an area of 26,970 sq km or 18.32 percent of the country's total area have been gazette notified.

Despite Nepal has several wetland ecosystems of national and global significance covering roughly 5 percent of its geographical area; their importance was recognised only in 1987 when Koshitappu Wildlife Reserve was first recognised as a Ramsar Site. Since then three additional wetlands namely Bishazari tal, Jagadishpur Reservoir and Ghodaghodi tal have been listed as Ramsar Sites. However, significant effort towards planned conservation and wise use of the wetlands in Nepal is yet to start. Most of these wetlands including those recognised not recognised as Ramsar Site are in the state of degradation. Unlike in protected areas, conservation and judicious use of wetland biodiversity, although backed by recent policy pronouncement, suffers from required legal provisions.

Nepal is a signatory party to over 25 major international conventions and treaties. From biodiversity conservation perspective, United Nations Convention on Biological Diversity, 1992; Ramsar Convention, 1971; World Heritage Convention, 1972; Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1975; United Nations Framework Convention on Climate Change, 1997; and United Nations Convention to Combat Desertification, 1994 are most important. Although Nepal's commitments towards these conventions and treaties are ensured by its 1990 Treaty Act through appropriate policies and legal provisions, complete translation of global environmental commitments into actions have suffered due mainly to lack of comprehensive and specific environmental legislations and backing regulations. As a result, implementation of the provisions of these conventions and treaties has been loose through patchy works.

In Nepal, policy and strategy are broad enough to effectively manage biodiversity on the one hand and reduce poverty on the other. Hence major problem is not the lack of policy but lack of enforcement in terms of their weak and delayed implementation. When there is national policy, there is no legal framework as in the case of National Wetland Policy, 2003 or the Nepal Biodiversity Strategy 2002 which not only addressees national priorities in biodiversity conservation but also encompasses 10 major international commitments. Likewise, if there is an Act, there is no rules or bylaws to effectively implement the legislation as in the case of Aquatic Animals Protection Act 1961 and Soil and Watershed Conservation Act, 1982 indicating lack of proper institutional commitment. The National Parks and Wildlife Conservation Act 1973 needs further amendment to properly enforce recent polices like the policy of management hand over of protected areas to non government and other organisations, and wildlife farming.

The Department of National Parks and Wildlife Conservation under the Ministry of Forests and Soil Conservation is the lead agency in the management of protected areas. The department, either on its own or through partner conservation organisations like King Mahendra Trust for Nature Conservation and with and without supports from Royal Nepal Army, manages all protected areas with its nearly 1,000 personnel through its headquarters and the field offices. Work load and job responsibility of the department has been increasing in recent years with buffer zones and other programmes as well as international conventions without any increase in its staff. Besides, the department is handicapped with outdated equipment and limited physical, financial and human resources to cope with the greater challenges. Since the approach of managing protected areas have changed to integrated conservation and development, the department requires strengthening in terms of expertise, facilities and resources for effective management of protected areas.

Unlike the protected areas, management of wetlands does not fall within the jurisdiction of a single organisation. At present management authority of wetland is vested based on ownership and hence several organisations like the Department of Forests, Department of Irrigation, District Development Committee, Village Development Committee, individuals, etc are involved in managing wetland in the country.

In course of implementing several programmes and projects over the years with the support of several donors, management approach of protected areas have changed from "fortress" styled management system to people-centred approach. In the people centred approach conservation is integrated with development of people in and around protected areas and linked to wider landscapes sometimes even crossing the national boundaries.

Analysis of available literature reveals disproportionate coverage of protected areas and wetlands in Nepal. While wetlands are less researched, research coverage of protected areas varied significantly in number and topics. In general, extent of research and development activities carried out within the protected areas varied with their age of establishment Variations are also observed in terms of basic documents like Management Plan and Strategic Framework documents. Also objective of protected areas in terms of conservation and poverty alleviation varied. While some PAs had both of these objectives, several others had only conservation objective.

The review also revealed several obstacles and gaps in the effective management of protected areas and wetlands. While some protected areas have suffered from external gaps and obstacles such as low public awareness and poor co-ordination with stakeholders; other protected areas suffered from internal gaps and obstacles such as low staff and absence of management plan. Even where management plans exist, they are not updated, not endorsed and not backed with human and financial resources. Likewise, other gaps and obstacles are reported to be natural hazards like flood, fire and alien species invasion and anthropogenic factors associated with weak enforcement of legislations.

Review analysis further revealed testing of different management modalities across protected areas resulting into different impacts on biodiversity and poverty. In general preservation approach had better biodiversity conservation impact without any significant positive poverty impact, integrated conservation and development and landscapes approach had positive impacts both on biodiversity conservation and poverty reduction. These approaches can be made more effective by integrating Ward Conservation Committee and POWER[1] tools of SABIHAA, a model community development through participatory management of watershed resources developed in Kaski and Parbat districts with the support of JICA Nepal.

All protected areas of Nepal when evaluated against a set of eight criteria reflecting biodiversity and poverty significance, Koshitappu Wildlife Reserve, Shivapuri National Park and Langtang National Park appeared the priorities for external interventions aimed at biodiversity conservation and poverty

[1] POWER stands for Poor, Occupational Caste and Women's Empowerment for Resources Management and SABIHAA for Samudayik Bikash Thata Hariyali Ayojana.

reduction. Similarly, Bishazari tal, Jagadishpur Reservoir and Ghodaghodi tal appeared the priority wetlands for external interventions. Review of SABIHAA modality from the perspective of its replication possibility in the management of protected areas and wetlands, indicated replication possibilities of its different components in protected areas and wetlands.

Field study not only revealed several realities but also brought several issues related to management of protected areas and wetlands for conservation and poverty reduction. One vivid reality is the fact that over 60 percent of households around these protected areas and wetland sites are either landless or operate very less land and belong to different caste groups without any definite pattern. As a result, despite all priority protected areas and priority wetlands are in the rural setting, agriculture did not appeared as the main occupations for majority of households. Only less than 35 percent of households around protected areas and around 50 percent around wetland sites had agriculture as one of the major occupations.

Land, livestock, dwelling structures and farm equipment constituted major livelihood assets of households around protected areas and wetland sites. The amount as well as the present value of assets held by households however varied between these sites. In general asset value of households belonging to user groups was higher than of households not affiliated to user groups and this was because poor households neither had cash to regularly deposit in group fund nor time to spend attending group meetings.

Across all the protected areas and wetlands covered by the field study, households dependence on forests was high for firewood, fodder, timber and other products. Over 70 percent of households around protected areas and 80 percent around wetland use firewood as the main source of energy. As a result, adoption of energy saving devices like improved cooking stove, rice husk stove, etc promoted by different agencies including the management authority was low. It varied from a highest of 22 percent in Shivapuri National Park to a lowest 4 percent in Langtang National Parks among the protected areas and from a highest of 10 percent in Bishazari tal to a lowest of 2 percent in Ghodaghodi tal among the wetland sites. It was noteworthy that less than 5 percent of households around protected areas and less than 15 percent around wetland sites reported using protected area forests and forests around wetland sites to supplement household firewood requirement. Majorities reported community forests as their main source of not only fuel wood but also other forest based products.

Household strategies to convert livelihood assets into outcomes resulted into varying levels of income. Among the protected areas studied, annual household income varied from a lowest of Rs 30,574 in Koshitappu Wildlife Reserve to a highest of Rs 56,207 in Shivapuri National Park among the user group members, and similar pattern among households not affiliated to user groups. In the case of wetlands studied, highest income was observed in Bishazari tal area (Rs 137,721 among user group and Rs 174,250 among non-user group households) and lowest in Ghodaghodi tal area (Rs 16, 908 among user group and Rs 20,687 among non-user group households). Non agriculture remained the major source of income across all types of households in all the protected areas and wetlands studied.

Although gender discrimination was not a problem in terms of representation in local organisations, this was rather vivid across all protected areas and wetlands studied in terms of decision-making positions. In general, more of males were found holding decision making positions in local organisations than the females. Also women's discrimination was observed in terms of access to capacity building programmes. In general women had less access to office management and enterprise development training than the males. From equity perspective, poor people particularly the landless had low representation in local organisations; and low access to decision-making positions in local organisations, training opportunities and programme/project promoted energy saving devices. However, no definite discriminatory patter was observed based on social grouping of households.

Field study also brought several issues related to conservation, conflict, management and poverty aspects having direct relevance on required future interventions. Building proper co-ordination among different stakeholders with varying interests, greater emphasis on research and development to generated more informed basis for conservation decisions, making monitoring regular and effective, increasing local level conservation awareness, and improved enforcement of legal provisions to control illegal activities affecting conservation negatively are the interventions required to deal with conservation issues.

Minimising wildlife damage through appropriate mitigation measures, provision of appropriate relief and compensations against unavoidable wildlife damage, safeguarding the sovereign rights of way and access of people to protected area and wetland resources, and creation of multi-stakeholder forum to co-ordinate organisations with varying interests are the interventions required to deal with conflict issues. Use of protected area and wetland resources such as drift wood, water and forests, etc in generating revenue and using such revenue in conflict minimisation in a sustained manner is an opportunity.

The rich biological resources in and around protected areas and wetlands are accompanied by the prevalence of poverty. Majorities of people living in and around these protected areas and wetlands are poor and are highly dependent on these resources for livelihood. Conservation of biodiversity and promotion of biodiversity centred livelihood opportunities especially for special target groups are the intervention measures required with the issues of poverty. This will call for devising a system of promoting sustainable harvest of non timber forest products and other resources through training and issuance of selective permits and operationalizing wildlife farming policy for the benefit of most affected population and creation of employment and income opportunities through ecotourism.

Review and field study have revealed that Koshitappu Wildlife Reserve, Shivapuri National Park and Langtang National Park among the protected areas and Bishazari tal, Jagadishpur Reservoir and Ghodaghodi tal among the wetlands qualify for Japan Nepal future co-operation. Since these protected areas and wetlands adequately reflect national as well as international priorities covering biodiversity, socio-economic including poverty, conflict, management, partnership and policy concerns, these are recommended for consideration by JICA in extending Japan's co-operation in the biodiversity sector of Nepal in future. Irrespective of which particular protected area and wetland is selected, attaining the twin objective of biodiversity conservation and poverty reduction will call for special attention in addressing a number of pertinent issues that are either not addressed or addressed insufficiently at the moment. The major issues to be addressed are equity, empowerment, participation and sustainability. Addressing these issues in the objective context would mean directing future interventions in creating enabling policy; legislation and institutional environments; enhancing and building stakeholder capacity; diversification of biodiversity-conservation-centred livelihood opportunities, and conserving biodiversity through participatory approach. Enhancing the effectiveness of the interventions in these four strategic areas also implies instituting a management system that ensures good governance minimises conflicts and promotes partnership.

If future Japan Nepal co-operation has to be focused in one protected area and one wetland, Shivapuri National Park among the three priority protected areas and Jagadishpur Reservoir among the priority wetlands qualify as these are observed to have high potential biodiversity conservation and poverty impacts from external interventions.

1 Introduction

1.1 Background

Nepal's land area spans slightly over 147,000 square kilometres (sq km) in the central Himalaya neighbouring China in the north, and India in the east, south and west. Lying in the ecological crossroads of the Asian continent, it covers three distinct east west running physiographic regions namely the Mountains in the north, the Hills in the middle and the lowland Tarai in the south[2]. Country's population estimated at 23.2 million in 2001 and growing at 2.3 percent annually is distributed as 7.3 percent in the Mountains, 44.3 percent in the Hills and 48.4 percent in the Tarai, which is nearly consistent with the distribution of its agricultural land (CBS, 2001).

The Mountains and the Hills together occupy about 77 percent of the total land area while the *Tarai* accounts for remaining 33 percent. Except for the Tarai region, topographic variations are quite large. The Mountain region occupies lands with altitudes greater than 3,000 m above mean sea level (amsl) and is characterized by its steep sloping lands. The Hills 40- 60 km wide falls in the altitude range of above 800 m and up to 3,000 m amsl and is also characterized by steep slopping land with intermittent valleys formed by rivers. The Tarai stretching 25-32 km north south lies in the altitude range of 80–800 m amsl is characterized by fragile Siwaliks in the northern side and by north south sloping land of Indo Gangetic plains.

Land use in these three physiographic regions varies significantly[3]. The variation in land use is also determined by a diverse assemblage of 11 bioclimatic zones from tropical to temperate. Governed by altitude and topography, climatic conditions, landforms, soil types, natural vegetation, production potentials, social and cultural settings, ways of life, farming systems, food habits, etc. differ significantly not only among these physiographic regions but also within each region. As a result, many different types of microclimatic pocket areas exist within the same district located in a particular agro-ecological and development region.

For administrative and development purposes, the country is divided into 75 administrative districts grouped in five development regions namely the Eastern Development Region, the Central Development Region, the Western Development Region, the Mid-western Development Region and the Far-western Development Region. Each district is further divided into a number of Village Development Committees (VDCs)/Municipalities and each VDC/Municipality into wards[4].

The inherent topographic and climatic variations within its geographical area spanning approximately 800 km east west and 200 km north south has made Nepal as one of the richest countries in the world in biological diversity. This unique feature of the country has bestowed it with 118 ecosystems, 45 vegetation types, and 35 forest types favouring both floral and faunal diversity. Besides, several Wetland Sites (WSs) contribute to a rich assemblage of biological diversity[5]. Though wetlands account for only 5 percent of Nepal's total area, they are remarkable for supporting 66 percent of 89 globally threatened animal species and 12 percent of 91 globally threatened plant species (BPP, 1995).

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[2] Land Resources Mapping Project has divided the country into five physiographic regions: High Himalayas, High Mountains, Middle Mountains, Siwaliks and Tarai.

[3] Majority of land area in the Mountains (39 percent) is occupied by rocky terrain with snowfields and glaciers, followed respectively by forests (32 percent), pastures (22 percent) and agriculture (7 percent). In the Hills, majorities of land is used for forests (58 percent) followed respectively by agriculture (35 percent), pasture (5 percent) and land under other uses (2 percent). Land use in the Tarai is predominated by agriculture (64 percent) followed by forests (28 percent), pasture/grazing (2 percent) and land under other uses (6 percent).

[4] There are a total of 3,912 VDCs and 58 municipalities. While VDCs are divided into nine wards, Municipalities are divided into several wards.

[5] Wetlands in Nepal range from areas of permanently flowing rivers to areas of seasonal streams, lowland oxbow lakes, high altitude glacial lakes, swamps and marshes, paddy fields, reservoirs and ponds. These wetlands cover over 743,000 ha of which rivers occupy 53 percent and paddy field 43 percent. His Majesty's Government of Nepal (HMG/N) explored 51 wetland sites of Tarai and out of which 36 were found to be biologically significant and 10 are reported to merit legal protection (BPP, 1995). In 1996, the World Conservation union (IUCN) Nepal prepared a detailed wetland inventory of 163 sites from the Tarai and 79 sites from the hills and mountains.

Nepal's biodiversity is characterized by its location in the transitional zone between eastern and western Himalaya, the Palaearctic and the Indo-Malayan biogeographical regions, and the major floristic provinces of Asia (the Sino-Japanese, Indian, Western and Central Asiatic, south east Asiatic, and African-Indian deserts). These are reflected through its 50 percent share in World's angiosperm families, over 2.7 percent of the flowering plants, over 1.0 percent of fish, amphibian and reptile species, 9.3 percent of bird species, and about 4.5 percent of mammal species including several species of endangered flora and fauna, though Nepal only shares 0.09 percent of the world's total land area (HMGN/MoFSC, 2002).

Although rich in biological resources, Nepal is one of the poorest countries in the world. With per capita income of US $257 per annum, it is ranked among the 10 poorest countries of the world. The low per capita income is also associated with a host of other socioeconomic indicators of poverty like low life expectancy (around 57 years at birth), adult literacy (38 percent), low Human Development Index (HDI)[6], high unemployment and underemployment and child-maternal malnutrition. Poverty in the country, largely, is associated with low privately owned resource base (FAO, 2001) and is reflected through high dependency of people on public resources[7].

High dependency of people on public resources coupled with limited opportunities of alternate incomes has been a major cause of degradation of Nepal's natural resource base threatening biodiversity at ecosystem, species and gene levels. This reality of Nepal was realized as early as mid fifties when the country's first Five-Year Plan (1956-1960) was prepared. However, concerted efforts towards biodiversity conservation began only after promulgation of the National Parks and Wildlife Conservation Act, 1973 (NPWCA, 1973) together with formal declaration of Royal Chitwan National Park (RCNP) through gazette notification. Since then HMG/N has declared and established a network of 16 Protected Areas (PAs) in different parts of the country. The 16 PAs established include nine National Parks (NPs), three Wildlife Reserves (WRs), one Hunting Reserve (HR), and three Conservation Areas (CAs). Figure 1 shows the location of these PAs in a map of Nepal. Two national parks, RCNP and Sagarmatha National Park (SNP) have been recognized as the World Heritage Sites for their unique landscapes and rich biodiversity. Similarly, four wetlands have been recognized as the international Ramsar Sites (Koshitappu, Bishazari Tal, Jagadishpur reservoir and Ghodaghodi Tal).

While government's initiatives towards biodiversity conservation through declaration of PAs have proved effective in preserving country's rare biological resources, many rural people have also been deprived of their traditional user rights of natural resources contained in these areas negatively affecting their livelihoods. This has resulted into illegal harvesting of natural resources and poaching of even rare and endangered wildlife species and increased conflicts between PA and the people. The negative impacts of preservation approach of biodiversity conservation on human livelihoods and its potential danger to conservation itself were realized only in the decade of 1990. This realization resulted into government's shift in management approach from preservation to conservation and from protective to collaborative. With this shift in approaches, people affected mostly from the PAs have been brought in the conservation initiatives of the government as seen in Annapurna Conservation Area (ACA) in 1992 and declaration of Buffer Zone (BZ) and implementation of BZ development programmes in six NPs[8] around mid nineties Further, efforts to integrate conservation with community development in and around PAs through corridors have also been initiated.

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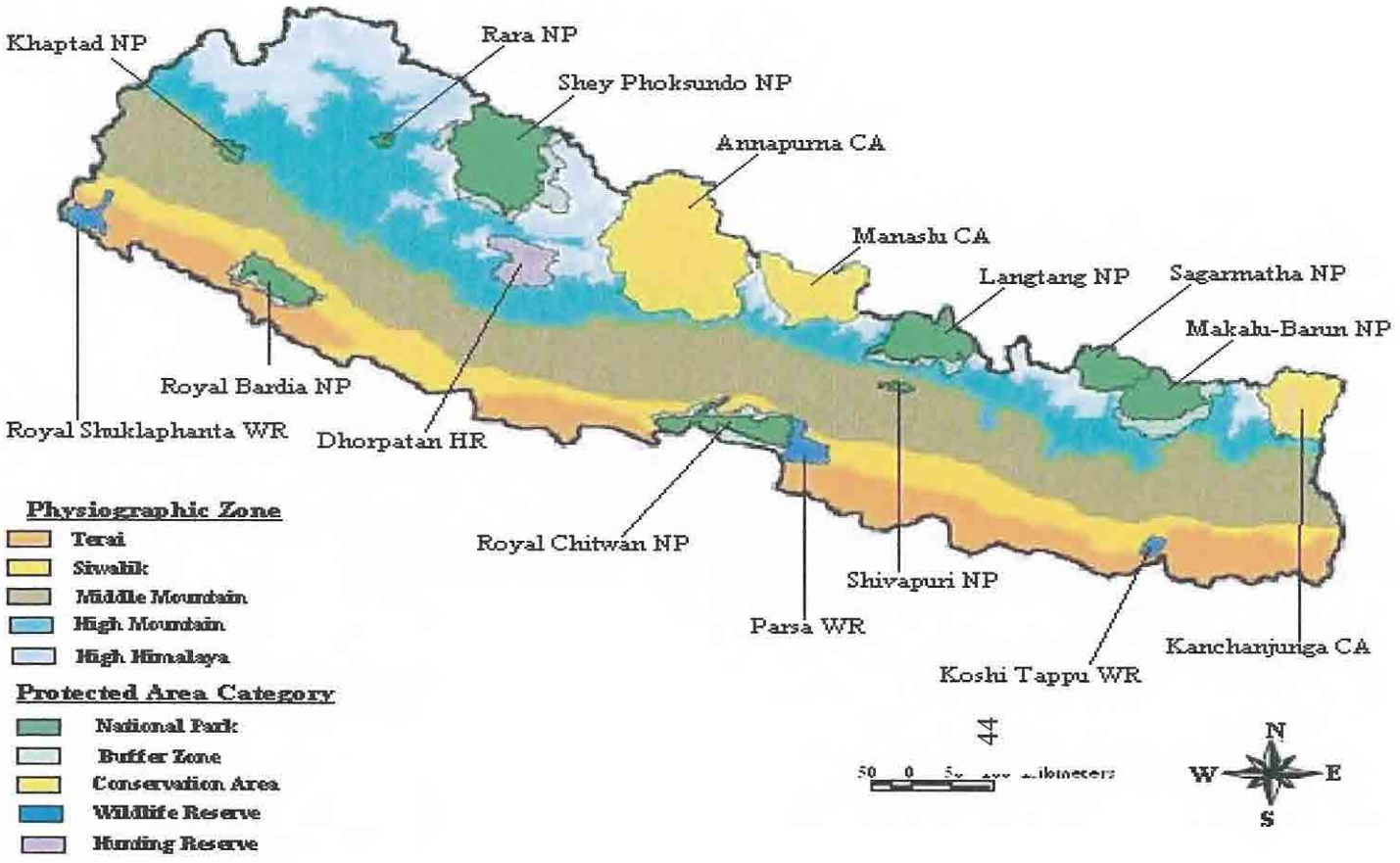
[6] With overall HDI value of 0.48, Nepal is ranked in 129th position among the 174 countries worldwide.

[7] People's dependence on public resources for livelihoods in Nepal is almost equal to that on private resources (Neupane and Poudel, 1998).

[8] While the process of integrating people in biodiversity conservation in PAs have been formally begun in three CAs (Annapurna, Manaslu and Kangchenjungha) and six NPs (RCNP, RBNP, MBNP, LNP, SPNP and SNP), process to formalize BZ declaration is ongoing in additional PAs as well. Including the three CAs and the six BZs the total protected area network, now, cover 18.32 percent of country's area.

Figure 1: Map of Nepal Showing Protected Areas



Several donors have assisted Nepal in her efforts to conserve biodiversity in PAs and to help improve livelihood of most affected people. Major donors supporting biodiversity conservation in PAs and WSs include the United Nations Development Programme (UNDP), the Asian Development Bank, the Netherlands Development Agency and the Department for International Development of the United Kingdoms. Several international facilities like the Global Environmental Facility and the United Nations Foundation, International Non-Government Organizations (INGOs) like the World Conservation Union (IUCN), the World Wildlife Fund (WWF), CARE and The Mountain Institute and trusts like the King Mahendra Trust for Nature Conservation (KMTNC) and the Himalayan Trust have also assisted Nepal in her efforts towards biodiversity conservation by supporting several conservation and poverty related programmes.

Donor support in the biodiversity conservation sector have, however, varied depending on their priorities and span over activities like conservation education, anti poaching, protected area management, species and habitat monitoring, tourism management, community development, tourism infrastructure development, wetland status survey, participatory conservation programme, landscape management, wildlife research, training etc.

Japan has been and is one of Nepal's largest bilateral donors since the decade of seventies. Its support routed through Japan International Cooperation Agency (JICA) in the natural resources conservation sector of Nepal, however, began only in the nineties with the implementation of Forestry Extension Project (1991-1994). This was followed through two phases of Community Development and Forest/Watershed Conservation Project in Kaski and Parbat districts wherein focus was made on community participation and capacity building. During this period, a participatory watershed / forest management and community development model called *Samudaayik Bikaas Tathaa Hariyaali Aayojanaa* (SABIHAA) has been developed and is being currently replicated in a few VDCs of Kaski and Syangja districts.

Successful involvement of JICA in Nepal's natural resources conservation and management has now been reflected into its Country Programme 2003 for Nepal. The country programme has identified poverty reduction as the principal goal of Japan's assistance to Nepal with strategic thrust placed on participatory management of the natural resources. Aiming to extend Japan's cooperation to Nepal in the participatory biodiversity conservation sector, JICA Nepal sponsored this study primarily to prepare detail profiles of PAs and WSs, analyze constraints and potentials, and to identify potential areas for Japan- Nepal future cooperation.

For JICA Nepal, this study on Poverty Reduction through Sustainable Management of Protected Areas and Wetlands in Nepal: Processes, Modalities, Impacts and Identification of areas for Future Support was carried out by the Centre for Natural Resources Management, Analysis, Training and Policy Research Private Limited (NARMA) between November 2003 and March 2004[9].

1.2 Objectives and Scope

1.2.1 Objectives

The overall objectives of this study is to conduct a comprehensive review analysis of biodiversity status in PAs and WSs of economic and conservation importance in Nepal and identify feasible areas of Japan Nepal future cooperation in promoting participatory biodiversity conservation and poverty reduction. Specific objectives of the study are to:

1. conduct detail review analysis of what have been done so far by different stakeholders for wildlife conservation in PAs and WSs with focus on priorities, operational modalities and impacts on biodiversity conservation and socioeconomic upliftment,

[9] After the signing the contract, the study was initiated on 3rd of November 2003.

2. identify successful modalities of participatory management of PAs and WSs having implications on their management for biodiversity conservation and socioeconomic upliftment of affected people,

3. based on the review analysis identify areas that are important both from the perspective of biodiversity conservation and socioeconomic upliftment of people surrounding PAs and WSs and prioritize these in terms of interventions required for biodiversity conservation and poverty reduction,

4. conduct a detail baseline survey of three priority PAs and three priority WSs to identify constraints to and potential for their management through participatory approach, and

5. identify and elaborate potential/possible areas for Japan Nepal future cooperation for the sustainable development of selected PAs and WSs following participatory management approach.

1.2.2 Scope and coverage

As per the Terms of Reference (ToR) furnished as **Attachment 1**, the study has covered the followings:

1. review and analysis of the existing and forthcoming policies, programmes, and legislations related to the PAs and WSs in Nepal.

2. review and analysis of the development programmes and institutional mechanism in the PAs and WSs sub-sector within the forestry sector and their periodic plans, policies and programmes.

3. review of various projects on PAs and the WSs assisted by different donor communities to assess the effectiveness of different modalities adopted in terms of biodiversity conservation and socioeconomic betterment of communities, and identify their major strengths and weaknesses,

4. identify major constraints to and potentials for community-based management of PAs and WSs for biodiversity conservation and socioeconomic betterment of communities,

5. identify promising PAs and WSs for community-based management for biodiversity conservation and socioeconomic betterment of communities and prioritize these in terms of urgent need for intervention,

6. conduct baseline survey of three priority PAs and three priority WSs covering different aspects and analyze conflict between people and PA and WS management and assess capacities of local bodies to maintain harmonious relationship between the socioeconomic development activities of the communities and the sustainable management of the PAs and WSs,

7. review and assess SABIHAA model and explore its replication possibility in selected PAs and WSs management, and

8. identify possible areas of Japan Nepal future cooperation for biodiversity conservation and socioeconomic upliftment of people in and around the PAs and WSs through community based participatory approach and elaborate project ideas into brief project concept notes for further development.

1.3 Methodology

This study was carried out in two distinct phases. While the first phase was focused on review analysis covering all the 16 PAs of Nepal and 10 WSs of Nepal's Tarai, the second phase was focused on field study of selected PAs and WSs.

1.3.1 Review study

The review analysis was divided into two parts. In the first part, a bibliography of PA and WS related literatures of Nepal was prepared and sorted by their type and contents including broader areas of information content. In the second part, most relevant literatures were consulted and reviewed analytically to suit the study objectives.

Bibliography search: Review analysis began with study team's visit to documentation centres and project offices of related organizations and by obtaining the list of related literature (reports, documents, brochures and other information materials)[10]. The elaborate list of literature was briefly scanned and documented in standard database of publication list by developing computer programme in Microsoft Access and by segregating these into PA and WS specific groups.

Review analysis: In view of the disproportionate lists of available literature across PAs and WSs, review analysis was organized objectively and systematically after specification of analytical focus and review approach. The review analysis was focused in five areas of enquiry namely, biodiversity, socioeconomic, conflict, managerial and policy/legislation aspects. For the review, Significances, Achievements, Lessons Learned, Obstacles, Gaps and Commitments (SALOGC) approach was adopted as was used for the formulation of the Nepal Biodiversity Strategy (HMGN/MoFSC, 2002).

Using the most recent literatures and following SALOGC approach, each PA and WS was reviewed covering the above-mentioned five areas of inquiry. The review analysis also involved both desk and field review of SABIHAA modality.

1.3.2 Selection of priority protected areas and wetland sites

A set of seven common criteria to prioritize PAs and WSs had been identified and suggested during the Inception Phase. Review of PAs and WSs revealed non-relevance of the exactly same set of criteria, and the indicators and variables to quantify these criteria. Based on the review findings and suggestions obtained during discussion of the Inception Report, eight criteria for evaluating PAs and seven for evaluating WSs were developed. Using these criteria three PAs namely (a) Koshitappu Wildlife Reserve (KWR), (b) Langtang National Park (LNP) and (c) Shivapuri National Park (ShNP), and three WSs namely (a) Jagadishpur Reservoir Ramsar Site (JRRS), (b) Bishazari Tal Ramsar Site (BTRS) and (c) Ghodaghodi Tal Ramsar Site (GTRS) were selected for detail field study. Details on the criteria used and selection results are presented in Chapter 3 sub-section 3.1.4.

1.3.3 Field study

Field study was conducted in three priority PAs (KWR, LNP and ShNP) and three priority WSs (BTRS, JRRS and GTRS) covering 10 stakeholders. These included PA/WS Authority, Local Unit of Conservation Partners, District Development Committee (DDC), VDC and Municipalities, related district Line Agencies (LAs), related Non Government Organizations (NGOs), related Community

[10] Organizations visited included the Ministry of Forest and Soil Conservation (MoFSC), Ministry of Water Resources (MoWR), Ministry of Agriculture and Cooperatives (MoAC), Ministry of Local Development (MoLD), Department of National Parks and Wildlife Reserve (DNPWC), Department of Forest (DOF), Department of Soil Conservation and Watershed Management (DSCWM), Department of Irrigation (DOI) among the government organizations; WWF, IUCN and TMI among conservation partners, ICIMOD, UNDP, DFID, SNV, Danish International Development Agency (DANIDA) and Norwegian Agency for Development (NORAD) among bilateral and multilateral donors, CARE-Nepal among international NGOs and KMTNC among national NGOs involved in conservation and development.

Based Organizations (CBOs) at three levels, related private sector, prison inmates and households. Following paragraphs describe the procedure used in selecting these stakeholders.

Selection of PA/WS authority: Three officials from each of the selected PAs and WSs were selected for discussions and interviews. These included the chief of the organization, concerned officer and one field staff.

Selection of local conservation partners: Chief of local conservation partners of selected PAs and WSs if available were selected for discussion and collection of primary information about their activities. Depending upon the availability, two such conservation partners were covered.

Selection of DDC officials: Two officials from DDC of district where PA headquarters / management unit of WS was located were selected for discussion and interview. These two officials included DDC Chairperson or Vice Chairperson and Local Development Officer. In a number of districts, Focused Group Discussion (FGD) was conducted with other officials of DDC as well.

Selection of VDC and Municipality: Two VDC/Municipalities were selected for field survey in each selected PA and WS. One VDC/Municipality was selected from among those adjoining the PA/WS and the other located farther from PA/WS. Two officials-Chairperson/Vice Chairperson and secretary were selected for discussion and interview. In addition, a half-day village workshop was organized for village level stakeholders.

Selection of District Line Agencies: Five line agencies that were selected for field survey in each selected PA and WS were in the field of forests, agriculture, livestock, irrigation and women development. Officials from the line agencies were contacted for discussion and interview on the issues pertinent to their programs relevant to the PA/WS in question.

Selection of NGOs: Depending upon the relevancy and availability, one to three NGOs operating in and around the selected PA and WS were selected for detail discussion. Where available, the three NGOs selected were picked from among those operating in three different functional areas- enterprise development, community development and conservation.

Selection of CBOs: Three types of CBOs were identified in respect of PAs and WSs. These are the settlement levels CBO herein after called operational level CBO representing User Groups (UGs) formed either for protection or for community development. The second type is the VDC level CBOs usually formed from representatives of operational level CBOs called User Committee (UC). The third type is either district or PA or WS site level federation of UGs called Management Committees/Councils. This network of CBOs was observed in PAs with well-defined BZ. Keeping this in mind, this study selected five UGs from each of the two selected VDCs/Municipalities, one UC from each VDC and one-district level committees. While selection of VDC and district level CBO was easy, as there were only one committees of the respective type, selection of operational level CBO was rather complicated. First, in each selected VDC, list of UGs was prepared and their type and activity determined. Then from the list and to the extent of their availability one female group, one male group, one mixed group, one group from among *dalits* and one group from ethnic minority involved in different activities was selected[11].

Selection of private sectors: Depending upon the relevancy and availability, one or more private sectors were selected in and around the PA and WS for discussion. The sectors selected were picked from among the tourism business owners, resource based producers such as fishing, and mineral water production, and organizations like chamber of commerce and industries.

Selection of prison inmates: Depending upon the relevancy and availability, one or more detainees were selected in and around the PA and WS for discussion. They were picked from among the people who were under interrogation.

Selection of households: Ten households affiliated to the UGs were selected from each of the five UGs selected. While selecting these UG member households, care was taken to obtain fair

[11] In areas where such distribution was not possible, these were selected randomly.

representation of people from different economic and social status[12]. In each selected group, two households not affiliated to UGs were also selected. Thus in each of the PAs and WSs studied, a total of 50 UG households and 2 non-UG households were selected.

1.3.4 Survey methods and survey instruments

Field survey work in each PA and WS started with the first visit to PA/WS authority. Concerned PA/WS authority was first briefed about the study and its methodology. Using the methodology mentioned above, stakeholders to be covered by the survey were identified jointly with the concerned PA/WS authority and a survey plan was prepared. Focused group discussion, interaction with individuals and interview method was used to probe on issues and to collect necessary information. While pre-tested questionnaire was used to collect household level information, pre-tested checklists were used to guide FGD and one to one interaction and interviews.

1.3.5 Data processing

Except for household survey data, all other information collected were of qualitative type and were collected using checklists. Such information was recorded in notebooks and was analyzed at the end of each field trips and brief report prepared for use in preparing the main report. Information from such report was combined with review findings in conducting Strength, Weakness, Opportunity and Threat (SWOT) analysis.

In the case of household survey data, the professionals and field supervisors checked questionnaires completed each day for completeness and consistency. Any gaps or inconsistency observed was rectified next day by revisiting the relevant households. These questionnaires were examined in Kathmandu before entering the data into microcomputers. Data from the questionnaire were directly entered in Excel Spreadsheet and processed using its pivot table and pivot reporting facility. Keeping the objectives in mind, dummy cross tables to summarize household data were prepared and information were analyzed by classifying households according to economic status proxied by the size of operated land and in places according to social class proxied by their caste group.

In course of finalizing the study report, three consulattions with stakeholders were carried out. The first consultation was done while finalizing the Inception Report, the second while finalizing the Review Report and final consultation while finalizing the draft report. Details on methodology are presented in **Annex 1**.

1.4 Report Organization

This main report is organized into five chapters. With background, objectives and methodology presented in this chapter, chapter 2 is devoted to the review of policies, legislations, institutions and programs and projects. The third chapter then concentrates on presentation of review findings covering all protected areas of Nepal and ten wetlands of Nepal's Tarai as well as SABIHAA modality. The fourth chapter then reports findings of field study in respect of the three PAs and three WSs covered by the field study. Presentation in this chapter is arranged to reflect significances, achievements, lessons learned, obstacles, gaps and commitments covering the five areas of enquiry namely biodiversity, socioeconomic, conflict, managerial and policy aspects followed by SWOT analysis from the perspective of biodiversity conservation and poverty reduction. This chapter is concluded by drawing implications for future interventions. Drawing from earlier chapters, the fifth and the last chapter then discusses potential Japan Nepal future cooperation areas in the biodiversity sector. Nine annexes and a number of annex specific appendices presented separately supplement this report.

[12] Originally selection of households was planned after wealth ranking exercise. Since this activity was not feasible due to prevailing security situation, this was done after discussion with members of selected UGs who had fair knowledge of economic and social status of their fellow member households.

2. Review of Policies, Legislations, Institutions, Programmes and Projects

The purpose of this section is to review government efforts in bringing improvements in the livelihood of people through conservation, enhancement, sustainable and wise use of biodiversity in Nepal with focus on PAs and WSs. This section is organized into six sub-sections. The first sub-section briefs PAs and WSs highlighting the contexts. The second sub-section reviews the polices, strategies and legislations related to the management of PAs and WSs. Institutional arrangements for the management of PAs and WSs are discussed in sub-section 3. While conservation approaches are discussed in sub-section 4, major projects implemented in PAs and WSs are briefed in sub-section 5. The sixth or the last sub-section draws lessons learned and conclusions from these reviews.

2.1 Context

2.1.1 Protected areas

Nepal embarked upon a modern era of wildlife conservation with the enactment of NPWCA, 1973. The clause 3 of this Act empowers HMG/N to establish PAs in line with IUCN 1994 Protected Areas System Categories such as strict nature reserve, NP, WR, HR, CA and BZ with four boundaries in any part of the kingdom through a gazette notification. Likewise, the Act allows the government to denotify from the PAs, to hand over the management or change the boundaries through similar notifications. At present, PAs in Nepal include nine NPs, three WRs, one HR and three CAs and six BZs covering an area of 26,970 sq km or 18.32 percent of the country's total area (**Attachment 2 Table 1**).

In Nepal, people interact with PAs in numerous ways. However, there is growing conflict over land use rights and practices. Firewood collection, livestock grazing and illegal hunting in the PAs, and crop raiding, livestock depredation by wildlife in the areas adjoining to the PAs are the common issues of conflict between park authorities and local people across all the PAs, although the extent of conflict varies among different PAs (Heinen, 1993). Human casualties or injuries caused by wildlife have also been reported in and around the PAs. Some studies have reported acceleration of negative environmental impacts due to high concentration of visitors in a few selected PAs, which are biologically fragile and are already under stress from local populations (HMG/N/MoFSC, 2002).

The Mountain region of Nepal has the highest number of PAs, followed respectively by Tarai and the mid-Hills. Despite greater ecosystem diversity, mid Hills are less represented in PAs. Likewise, in terms of area coverage also, Mountain region exceeded Tarai and the Mid-Hills. More the number of PAs and their coverage means greater the efforts on the part of government to protect biodiversity and higher is the likeliness of conflicts between the people and PA with increasing management complexities.

2.1.2 Wetland sites

Wetlands are among the most productive ecosystems in the world, often referred to as the "nature's supermarkets" and important natural ecosystems because of their extensive and rich food webs and biodiversity. They are also the cradle of aquatic biodiversity, and provide water and primary productivity upon which countless species of plants and animals depend for survival (IUCN, 1998).

Nepal has several wetland ecosystems of national and global significance. According to a study by IUCN-Nepal, the country has 242 WSs: 163 in lowland Tarai and 79 in the Hills and Mountains. Among them four WSs namely the KWR, JRRS, BTRS and GTRS are listed under the Ramsar convention. While all communities benefit from wetlands, about 17 percent of the country's population from 21 ethnic communities mostly poor and marginalized has traditionally based their livelihoods on wetlands (IUCN, 1998).

However, wetlands account for only 5 percent of Nepal's total surface area they have high ecosystem diversity and support high global biodiversity[13]. They are also important stopover and breeding grounds for tens of thousands of passage migrant and wintering birds and waterfowls that traverse the global avian flyways. However, increasing human pressures have led to alteration and degradation of these ecosystems causing reduction or loss in their biodiversity, their ecological functions, economic, cultural and spiritual values, wetlands have become some of country's most threatened habitats. According to the BPP, 1995, of the 51 wetlands of Tarai 36 are deemed biologically significant and 10 of which merit legal protection **(Attachment 2 Table 2).**

With UNDP-GEF funding support, HMG/N and IUCN Nepal have recently developed a project entitled Conservation and Sustainable Use of Wetlands in Nepal to promote the conservation and sustainable use of wetlands and thereby improve wetland biodiversity and contribute to rural livelihoods in Nepal. The proposed project aims to address the root causes of wetland loss and degradation through appropriate policy and planning, institutional strengthening and creating economic incentives for wetland conservation. It plans to develop replicable models of collaborative wetland management while working in the two proposed demonstration sites: the KWR and its proposed BZ in eastern Nepal, and the GTRS complex in far western Nepal.

2.2 International Conventions, Policies and Legislations

2.2.1 International convention and treaties

Nepal is a signatory party to over 25 major international convention and treaties, including United Nations Convention on Biological Diversity (CBD) of 1992, Convention on Wetlands of International Importance especially as Waterfowl Habitat called Ramsar Convention of 1971, World Heritage Convention of 1972, Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) 1975, UN Framework Convention on Climate Change of 1997 and UN Convention to Combat Desertification of 1994. CITES requires national legislation for its implementation as an obligation of the convention. There are 10 major international conventions that are closely relevant to NBS **(Attachment 2 Table 3).**

According to the Nepal Treaty Act 1990, the provisions of Convention and Treaties are equally enforced through national laws. However, lack of comprehensive and specific environmental legislations and backing regulations, complete translation of global environmental commitments into action have suffered in Nepal. Implementation of the convention's provision appears loosely addressed through patchy works. This has happened not because Nepal does not know her obligations but because there is no institutional commitment (Shrestha et.al. 2000). This is reflected in poor and insufficient inter ministry coordination and cooperation, which is necessary for the effective and timely implementation of these conventions and treaties.

2.2.2 National policies

With the enactment of the Wildlife Conservation Act 1957, which has now been replaced by the NPWCA 1973, HMG/N has been giving due importance to the protection of wildlife in all five-year development plans. As there are more than forty environmental policy and related legislations in Nepal, major biodiversity conservation related policies formulated by government of Nepal are described below.

[13] Of the various species found in the country, wetlands support 66 percent of 89 globally-threatened animal species found in the country, 47 percent of 74 near-threatened animal species, 85 percent of 20 endemic vertebrates, 25 percent of 7,000 vascular plant species, 23 percent of 859 bird species, 12 percent of 91 globally-threatened plants, and 10 percent of 246 endemic flowering plant species.

Master Plan for the Forestry Sector Nepal (MPFS), 1988
The MPFS, 1988 has identified conservation of ecosystem and genetic resources as one of its long-term objectives. The plan has emphasized need to meet people's basic needs of forestry products by reducing park-people conflict. The plan has suggested DNPWC to formulate PA working policy to manage PAs efficiently for biodiversity conservation and people's welfare. In this context, MPFS underscores for the need to regulate and limit tourism within the carrying capacity of the ecosystems in the PAs.

National Conservation Strategy for Nepal (NCS), 1988
Formulated in 1988, NSC is a landmark in line with the World Conservation Strategy, laid down by the government through National Planning Commission (NPC) of Nepal and IUCN-Nepal collaboration. Having recognized the need to reverse the damage and destruction of natural and cultural heritage, as well as encroachment on heritage sites, forests and sacred grounds, the NCS aims to bring about sustainable development to meet the basic needs of the people, preserve biological diversity, and maintain ecological and life support systems through sustainable use of natural resources.

Nepal Biodiversity Strategy (NBS), 2002
The NBS 2002 is a commitment of HMG/N towards protection and use of the country's biologically diverse resources, conserve ecological processes and systems, and ensure equitable sharing of all ensuing benefits on a sustainable basis for the benefit of the people. This is also a fulfilment of one of the Nepal's obligations under CBD. Among others, NBS recognizes close links between biological diversity and livelihoods and economic development, and relates this to agricultural productivity and sustainability, human health and nutrition, indigenous knowledge, and gender equality, building materials, water resources, and the aesthetic and cultural well being of the society.

The NBS recognizes the need for a comprehensive approach aimed at conserving forests, soil, water, and biological diversity while at the same time meeting the basic needs of people who are dependent on these resources for their livelihoods through consolidation and continuation of past successful efforts. Cross-sectoral strategies of the NBS include landscape planning, integrating local participation, institutional strengthening, in-situ conservation, strengthening the National Biodiversity Unit etc. Recently, HMG/N has finalized the NBS Implementation Plan (NBSIP) to translate NBS visions into actions by addressing, among others, the issues related to management planning, resource allocation and capacity development.

Nepal Trust Fund for Biodiversity (NTFB)
The government has approved a NTFB as a component of NBS to provide financial support for biodiversity conservation focusing on management of PAs including BZs as well as for carrying out conservation-related activities outside the PAs. The fund profile includes objectives, legal structure, process/ modus operandi, governance, administrative mechanism, funding source and criteria for funding eligibility.

The NTFB is a long-term sustainable funding mechanism in the NBS. As outlined in the NBS, NTFB will be legally constituted as an autonomous legal entity by an Act of Parliament. With a tax-free status, NTFB will be managed as a grant provider, fund-raiser and manager, and as promoter of biodiversity conservation.

Conservation and Management of Biodiversity in the Tenth Plan
Since the beginning of systematic planning exercise in 1956, nine Five-Year plans have been formulated and implemented. Although these plans had implied objective to attack poverty, poverty reduction appeared as one of the main objectives of the Ninth Plan (1997-2002) and the overriding goal of the current Tenth Plan (2002-2007). The plan seeks to reduce poverty from 38 percent to 30 percent by 2007 through emphasis on four key areas, high, sustainable and broad-based economic growth; social sector and rural infrastructure development; targeted programmes for the ultra-poor, vulnerable and deprived groups; and good governance.

The Tenth Plan does not have a separate chapter on biodiversity conservation and wetlands management. Its priorities in these sub-sectors are incorporated within the genetic resources and biodiversity conservation programme under the broader forest and soil conservation sector. Among the two-forestry sector objective of the plan, sustainable management and the conservation of vegetations, medicinal plants, soil and watershed, and biodiversities through the management of the forest and watershed adopting participatory processes and systems is directly related to biodiversity conservation. Among the several forestry sector policies stated in the plan, the policy of officially recognizing the proposed Nepal Biodiversity Strategy and Implementation Plan and of gradually implementing its priorities is the major one. This policy is aimed at reducing poverty by creating additional employment opportunities and increasing the awareness on wildlife protection and by encouraging people for wildlife farming and related activities.

National Wetland Policy (NWP), 2003

HMG/N announced NWP 2003 on 29 March 2003 thereby fulfilling its obligation under the Ramsar convention. This policy provides framework for conservation and sustainable use of the country's wetland ecosystems by putting people at the centre of conservation and management of wetland resources. NWP is the beginning of a new era in the conservation of these very important ecosystems. It has emphasized on the participation of all stakeholders and allowed management of wetland under six models. These include joint management, community management, management on lease, religious management, government management and private management.

Revised Forest Policy (RFP), 2002

The revised forest policy 2002 reviews and updates the objectives of MoFSC. The policy accords high priority to biodiversity conservation while ensuring both sustainable livelihoods and a landscape planning to manage biodiversity on an ecological basis. Due emphasis has been given to sustainable utilization of forest resources and community participation in decision making as well as sharing of benefits.

Tarai Arc Landscape Strategy (TALS), 2004

HMG/N through MoFSC approved the TALS on 10 February 2004. Prepared after wider and in depth consultation with all stakeholders, TALS is based on conservation science, root cause analysis and priorities set out in important government's guiding documents like the Tenth Plan, 2002, NBS, 2002, Millennium Development Goals and Sustainable Development Agenda for Nepal. The TALS is now the main government document to guide planning and implementing of natural resource management projects/programmes under landscape concept. Though this strategic plan is framed for a 10-year period from 2004 to 2014, its vision goes forward to 50 years and beyond. Its vision is articulated as "A globally unique landscape where biodiversity is conserved, ecologically integrity safeguarded and sustainable livelihoods secured."

Nepal Environmental Policy and Action Plan (NEPAP) and NEPAP II

The NEPAP was prepared and adopted in 1993 by the Environment Protection Council (EPC). It has recommended policies and actions in a wide array of sectors including biodiversity conservation and sustainable management of natural resources. The Action Plan, among others, suggests strengthening the capacity of the DNPWC to act as the main institution for PAs, involve local people in the management of the NPs, and preserve endemic and endangered species and their habitats. The NEPAP emphasizes to promote public-private institutions for biological resource inventory and conservation. The NEPAP was further elaborated in 1998 (NEPAP II) to address cross-sectoral priorities including forestry sector. As a high priority project, NEPAP II recommended carrying out a survey of mid-Hill ecosystems for the establishment of PAs. It has identified 54 environmental projects related to the forestry sector.

Working Policy on Wildlife Farming, Breeding and Research, 2003

Working Policy on Wildlife Farming, Breeding and Research, 2003 was approved on 28 August 2003 to clarify government positions and processes and programmes that it will adopt in encouraging individuals, groups, and institutions in farming and research of high value wild fauna such as spotted

deer, musk deer, *samber* deer, wild boar, etc **(Attachment 2 Table 4)** and thereby improve the living condition of the women, poor and disadvantaged section of the society. This policy is consistent and supportive to the biodiversity policies of the Tenth Plan (2002-07) for the creation of employment and income opportunities through conservation, enhancement and sustainable utilization of wildlife.

In line with the recent globalization trend and market economy policy pursued by the government, this policy aims to conserve rare and endangered wildlife species in the verge of extinction. This is envisaged through in-situ conservation in natural habitats and ex-situ conservation by encouraging the private sector in farming, breeding and carrying out scientific research and studies on endangered and high-value wild animal species, and thereby contributing towards poverty reduction goal of the government.

However, government is yet to develop appropriate legal and institutional framework to promote private sector participation in farming, breeding and scientific research and study of endangered and other wild animal species. While developing regulations, the government should be vigilant towards its commitments for regulating international trade on wildlife and plant species as well as to biodiversity conservation.

Captive Elephant Management Policy, 2060 (2003)
HMG/N approved the policy on Captive Elephant Management on 16 September 2003 to define and maintain an appropriate balance between the roles of the government and the private sector, and to foster public private partnership in this respect. Under the policy, while the role of government will be on conservation, breeding and management of captive elephant for research, fighting natural disasters and other essential services; private sector role will be centred on expansion and commercialization. This policy declares to follow the CITES obligations in implementation.

Policy of Handing Over the Management Responsibilities of National Parks, Wildlife Reserves and Conservation Areas to Non-governmental Organizations or Other Organizations, 2003
HMG/N formulated working procedure to handover different NPs, WRs and CAs to interested NGOs and other organizations on 15 August 2003 within the broader policy framework stated in the Finance Minister's budget speech of FY 2060/61[14]. It was stated that the objectives of the policy is to contribute significantly towards improving the environment, biodiversity conservation, eco-tourism development and benefit sharing through participatory approach keeping the agenda of poverty reduction at the forefront.

Formulation of this policy was felt necessary, as the budget speech for FY 2060/61 had stated that the government would permit interested non-governmental organization (NGO) or other organization to manage the protected (conservation) areas except RCNP, Royal Bardia National Park (RBNP), SNP. LNP and RSWR. The purpose of this policy is to promote effective usage of protected areas for eco-tourism development and poverty alleviation, through creating income and employment opportunities without compromising environment and biodiversity conservation[15].

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14 As per this policy, HMGN has issued letters of intent to KMTNC in respect to ShNP, Shey Phoksundo National Park (SPNP), Rara National Park (RNP), and Khaptad National Park (KNP), and Kangchenjungha Conservation Area Management Council in respect to Kangchenjungha Conservation Area (KCA)

15 Even if the management of protected areas is being given to NGOs, the policy states that it will never allow violating the following conditions:

- Any activity that do not match with the fundamental principles of protected area or negatively impact on the conservation and management of biodiversity shall not be allowed to implement.
- The ownership of all the protected areas and the wildlife, plant resources including biological, cultural and other natural resources within such areas will remain with the HMG/N.
- Services and benefits, as per the prevailing law, being received by the communities living in the declared buffer zone of the protected areas will in no way be reduced.

2.2.3 Legislations

Nine different legislations are directly or indirectly related to biodiversity conservation. The essential features of these legislations in respect of biodiversity conservation and poverty reduction are summarized in subsequent paragraphs.

National Parks and Wildlife Conservation Act (NPWCA), 1973

The NPWCA, 1973 is a key legal instrument in protecting biodiversity within the PA system. This Act is a major breakthrough in conservation and a basis for PA establishment. It shows government's commitments towards conservation of floral and faunal diversity by making legal basis to protect and safeguard the endangered and rare wildlife species[16]. Under this Act, 16 PAs have been established across the country.

The Act has been amended four times since its first promulgation in 1973. These amendments allowed for declaration of certain areas as CAs and BZs, and prescribed management modalities and sharing of accruing benefits.

The Bill on the Fifth Amendment of this Act has been prepared and forwarded to MoFSC. This amendment, among others, includes provision for farming of common wildlife species, invigoration of research studies, detailed specification of the provision of BZ, and specification relating to the exchange of wildlife species with other countries.

Nine different regulations under this Act have already been adopted in course of implementing its provisions[17]. Among these regulations, the National Parks and Wildlife Conservation Rules 1974 prescribe various regulations as to the use of natural products, or perform any other necessary functions inside the NP or WR. Likewise, the MoFSC approved Buffer Zone Management Guidelines 1999 for the implementation of BZ concept at field level. This has already been implemented in the six BZs of PAs declared so far.

The regulations for managing captive elephants promulgated in 1966 have been instrumental for the *Hattisar* management. However, this regulation has become invalid after the enactment of new civil service code.

The NPWCA 1973 and the pertinent Regulations need to be reviewed and revised to address various aspects of biodiversity conservation such as biological corridors, antipoaching strategy, research protocol, pollution in the rivers bordering the PAs, regulation of number of visitors and hotel/lodges at specific sites, orphan animals, and compensation for wildlife damages and causalities.

The Schedule I of the NPWCA 1973 protects 39 species of wildlife and needs to include several other species whose populations are critically low and need legal protection **(Attachment 2 Table 5)**. The wildlife species that need to be taken account of in the Schedule I include mammals such as blue bull and sloth bear, and some species of small mammals like rodents and bats, amphibians and aquatic life.

Forest Act, 1991

Forest Act, 1991 has contributed to the conservation of biodiversity through strengthening Forest User Groups in the management of national forests. All forests outside the PAs are governed by this Act and its Regulations. The Act facilitates the integration of the CF, biodiversity conservation and

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16 Under this Act, 27 mammals, 9 birds and 3 reptiles are fully protected (Attachment 2 Table 5).

17 These regulations are Royal Chitwan National Park Regulations 2030 (1973), National Parks and Wildlife Conservation Regulations 2030 (1973), Wildlife Reserve Regulations 2034 (1977), Himali National Park Regulations 2036 (1979), Khaptad National Park Regulations 2044 (1989), Buffer Zone Management Regulations 2052 (1996), Royal Bardia National Park Regulations 2053 (1996), Conservation Area Management Regulations 2053 (1996), Conservation Area Governmental Management Regulations 2057 (2000).

community development. The Forest Act (1993) and Forest Regulations (1995) recognize forest user groups (FUGs) as self-governing and autonomous entities, which generate their own funds. These legislations have empowered FUGs to carry out all the programmes in their community forests including conservation of biodiversity, utilization of forest products and community development.

King Mahendra Trust for Nature Conservation Act 1982 (KMTNCA, 1982)
Under this Act the government has established KMTNC in 1982. The trust is named after the late King Mahendra Bir Bikram Shah Dev. The Trust is mandated as an autonomous, non-profit, and non-governmental organization to work in the field of nature conservation. It enjoys special access to the PAs for research and conservation activities, and is bestowed with the responsibility of managing two CAs namely Annapurna and Manaslu, and the Central Zoo. The Act is supported with KMTNC Regulations.

Aquatic Animals Protection Act 1961 (AAPA, 1961)
The AAPA promulgated for protecting aquatic animals in natural water bodies like rivers, reservoirs and lakes has remained virtually defunct due to the lack of related bylaws/regulations. After 38 years of its promulgation, parliament revised it in 1998 to activate it. Section 5a included in this amendment permits only the use of safe pesticides in case any poisonous material is to be used for catching aquatic life. Sections (4a), (4b) and (5) empower the government to prohibit catching, killing and harming certain kinds of aquatic animals in different scenarios. Due to insufficient intra-ministry and inter ministry coordination and pending adoption of required regulation its enforcement is still pending. The DDC, exercising the licensing of fishing in natural water bodies has not been given responsibility of aquatic life protection. Similarly, the MoWR, the authority of the natural water bodies is not empowered legally for the conservation and protection of aquatic life.

Soil and Watershed Conservation Act 1982 (SWCA, 1982)
This Act empowers the government to declare any area to be a protected watershed. The preamble to this Act says that this Act has been formulated with a view to make legal provisions pertaining to conservation of watershed through the control of natural calamities, such as floods, landslides and soil erosion, and to ensure convenience and economic interest of the people in general. The land within the watershed is classified according to land use, and official permission is needed to exploit any forest products. This Act does not have provisions for the institutionalization of UGs and UCs. However, this Act for lack of regulations has not been effective.

Water Resources Act, 1992
The objective of the Water Resources Act, 1992 is to make legal arrangements for determining beneficial uses of water resources, preventing environmental and other hazardous effects thereof and for keeping water resources free from pollution. According to the Act, the ownership of water resources within Nepal is vested on the Kingdom. It stipulates that soil erosion, landslides, floods or adverse impacts on the environment should be avoided while generating electricity, digging canal and other works. The Act strives to prevent environmental damage to wetlands, lakes, and rivers through Environmental Impact Assessment (EIA) studies. However, strict enforcement of EIA guidelines has not been possible in most instances either in PAs or on WSs.

Environment Protection Act 1997 (EPA, 1997)
The EPA, 1997 is formulated to maintain clean and healthy environment by minimizing, as far as possible, adverse impacts likely to be caused from environmental degradation on human beings, wildlife, plants, aquatic animals, nature and physical objects and to protect environment through proper use and management of natural resources. Provisions under the Act requires carrying out the Initial Environment Assessment (IEE) and Environment Impact Assessment (EIA) depending upon the degree and nature of the development work before undertaking such works, physical constructions which may bring about changes in the existing environmental conditions. This Act is supported with the Environment Protection Regulations 1998.

Livestock Health and Livestock Service Act 1998 (LHLSA, 1998)
The objectives of LHLSA, 1998 are to develop and maintain animal husbandry, to produce healthier food and to produce, distribute, export and import healthier animals, animal products or animal product substances. The Act empowers HMG/N to establish permanent or temporary quarantine check post in any part of the kingdom by publishing gazette notification. Likewise, the Act requires the person who wishes to export or import biological materials, checks, fingerlings or animal feed, must obtain permission by paying prescribed amount from the prescribed authority.

Local Self-Governance Act 1999 (LSGA, 1999)
The LSGA, 1999 provides legal framework for the decentralized governance and has delegated the DDCs and VDCs to formulate and implement plans and programmes for the conservation of biological diversity and soil conservation in their respective geographical areas of legal jurisdictions. The Act also provides DDCs access to boulders and sand in the rivers flowing in the district. The DDC can authorize contractors to collect such resources as well as drift wood lying on the riverbeds outside the park or BZ. However, the DNPWC manages all forests within national parks or wildlife reserves. NPWCA 1973 and BZ Guidelines have kept the role of local bodies to a minimum in the management of NP/WR or its BZs.

Section 55 empowers VDC to levy taxes on utilization of natural resources. Section 68 lists the property of the VDC, which includes natural resources. Apparently, natural resources include water resources and thus VDCs have an absolute authority over the natural resources.

Section 189 of the Act elaborates the powers and functions of the DDC, which include formulation, and implementation of plans for conservation of forest, vegetation, biological diversity and soil. If section 189 and section 202 were read together, DDCs would have power to stop some of the development projects considered environmentally unsound.

2.3 Institutions and Institutional Arrangements

2.3.1 Protected areas

Institutionally, the DNPWC under the MoFSC is responsible for the administration and management of PAs and thus for the conservation of resources therein. It works through its network of 9 NPs, 3 WRs, 1 CA[18], 1 HR and 6 BZs and manages these PAs either on its own or by sharing management responsibilities with other conservation partner organizations. DNPWC also manages a musk deer farm at Godavari, Lalitpur, and the Blackbuck protection area at Khairapur, Bardia. In 11 PAs, Royal Nepal Army (RNA) is deployed to assist Park authority for surveillance and protection of wildlife from wood smugglers, poachers, domestic animals, fires, and public encroachment. While the Immigration Department is responsible for issuing trekking permits, the Ministry of Culture, Tourism and Civil Aviation is responsible for issuing mountaineering permits and for the development of auxiliary services and infrastructure to accommodate trekkers and tourists who visit high mountain national parks.

The DNPWC is a full-fledge institution for law enforcement as provisioned by the NPWCA 1973 and the respective regulations. For carrying out its tasks, the department works with and through different organizations and projects like KMTNC and BZMC through its network of UGs and UCs. The DNPWC has developed innovative park management strategies in collaboration with local residents, NGOs, INGOs, and donors. For example, the Himalayan Trust, a pioneering organization in health, education and conservation in Khumbu, is the principal partner in SNP and its BZ programme implementation. In the case of the ACA, the KMTNC is its management partner organization having strong influence on conservation and overall development including tourism.

[18] 2 CAs are under the management of KMTNC

From the review of administration and management systems across the PAs, five different administrative modalities are observed. The first modality involves PA administered by DNPWC with support from RNA and BZ community. Under this arrangement, five PAs (RCNP, LNP, SNP, SPNP and RBNP) are included. In the second modality where PAs are managed by the department with support from RNA, six PAs namely RNP, KNP, ShNP, RSWR, KWR, and Parsa Wildlife Reserve (PWR) are included. Under the third modality where PAs are administered by the department with supports from BZ community only, two PAs - MBNP and KCA -are included. In the fourth modality where department alone administers all PA activities, one PA (DHR) is included, and under the fifth modality where in PAs are administered through NGOs, two PAs (ACA and MCA) are included.

From the review, following four groups of programme implementation arrangements within the above-mentioned five administrative arrangements are observed:

(1) programmes run through government's own fund without direct or indirect support from conservation partners like in MBNP, ShNP and DHR,
(2) programmes run through KMTNC alone with or without support from donor communities/ funding agencies like in MCA and ACA,
(3) programmes run through governments own fund along with the direct or indirect support from conservation partners like in KCA, LNP, KWR, PWR, KNP, SPNP, SNP and RNP; and
(4) programmes implemented either independently or jointly by the government with direct or indirect programme funding from donor like in RCNP, RBNP and RSWR.

2.3.2 Wetland Sites

Unlike in PAs, management responsibility of wetlands does not fall under any particular government department. It is vested in different organizations based on such factors as the location, use, purpose etc. For example, BTRS in Chitwan comes under the responsibility of the RCNP as it is located in the national forest within its BZ. The DFO Kailali, on the other hand, manages GTRS since it is located within the national forest. Likewise, JRRS belongs to the DOI and is managed jointly by the Water Users' Association (WUA) formed under the Banaganga Irrigation Project (BIP). In a similar manner, an NGO (Public Asset Development and Protection, Chimdi 2000) formed with the support of both VDC and the DDC manages rehabilitation, development and protection of Chimdi Tal in Sunsari district.

According to the Clause 9 (1) of the EPA, 1997 all concerned organizations are responsible for the protection of national assets. This means that all VDC, DDC, Department of Archaeology, Ministry of Education and Culture, MoFSC, Environment Protection Council are responsible for the conservation of wetlands. Clause 68(1) of the LSGA makes the VDC responsible for managing and protecting natural resources, which include the wetlands within the VDC, if these resources are not owned privately by an individual or by HMG/N and the DDC. However, VDC can neither sale the resource on its own without the permission of the government nor disclaim the authority. Yet, the VDC might use the services of any governmental or non-government organization as it wishes.

Above mentioned provisions of LSGA suggest that wetlands in Nepal have been overlooked as an important habitat type and that many wetlands are suffering from land and water pollution while others have been drained and converted to agricultural land (NBS 2002), though some valuable wetlands have been given protection within PAs. In short, DNPWC and DOF are responsible for the management of wetlands in and outside the PAs respectively. MOAC and its departments of agriculture and livestock services are responsible for the utilization of wetlands for fisheries. Similarly, DOI is responsible for the irrigation water. The DDCs and VDCs are responsible for the conservation of the wetlands pursuant to the LSGA. Thus, there is no single organization in Nepal to act as an umbrella organization to coordinate the programmes and activities of wetlands.

2.4 Conservation Approach

Nepal has initiated several innovative approaches in the past to fulfil its international and national commitments towards biodiversity conservation. However, over the years emphasis has moved from protection to participation, from species focused preservation to ecosystem-focused conservation and now to landscape approach. This section assesses these conservation approaches as adopted by the government in the past under different projects and programmes.

2.4.1 Species preservation approach

Species preservation approach came into existence in mid sixties. The emphasis then was laid on the protection of charismatic species like the tiger and rhino. Under this approach, large areas were either turned into NPs or given other protected status limiting resources use such as fishing, hunting and collection of plants. The concept of NP in Nepal influenced greatly by the London Convention of 1933 emphasizes total exclusion of all human activity inside the park to keep it intact and substantially unchanged. This approach totally ignored the interest of the people.

Similar to other countries in the world in the seventies, Nepal also gave importance to in-situ[19] and ex-situ[20] conservation of biological species through the establishment and/or strengthening of PAs because of intrinsic values of species contained therein. Protection of these areas had significant impact on the survival of many symbolic species such as Rhino, Tiger. Elephant, *Arna*, Musk Deer, Snow Leopard, *Gharial*, pheasants, etc. The success was achieved by imposing strict park regulations and by denying people's access to park resources negatively affecting livelihoods of many marginalized and poor communities.

Rhino and tiger conservation programmes in Chitwan, Shuklaphanta and Bardia are the best example of Species Preservation Approach implemented in Nepal. Tiger Ecology and Operation Tiger Projects are another example. This project emphasized for protection of species without considering the involvement of local people in conservation.

Because of this conservation approach, population of various wildlife species increased significantly. The increased wildlife population, however, inflicted damage to life and property of people living near the PA resulting into park people conflicts and into potential threats to conservation itself.

While the major strength of this approach lies in its appropriateness for the conservation of the most endangered species in the verge of extinction, following shortcomings are observed:

- Ignores religious, cultural and economic ties between people and wildlife and of the fact that conservation is a part of rural livelihood;
- Centred on conservation of symbolic species by denying people's access to park resources resulting into threat to rural livelihoods and to the wildlife itself through illegal resource exploitation and retaliatory killings;
- Unsustainable for being top down and more bureaucratic approach requiring heavy dependency on protection staff for conservation; and
- Heavy enforcement cost with limited effectiveness

[19] "In-situ" conservation - the primary means of conservation - focuses on conserving genes, species, and ecosystems in their natural surroundings, for example by establishing protected areas, rehabilitating degraded ecosystems, and adopting legislation to protect threatened species.

[20] "Ex-situ" conservation - As a part of ex-situ conservation, the government has established zoos, botanical gardens and gene banks to conserve species.

2.4.2 Conservation and development approach

Worldwide experiences of species preservation approach revealed that attaining the goal of sustainable development would be remote unless species conservation provides a direct benefit to the rural people. Realizing that conservation is no longer isolated movement but a central factor in the land use planning and economic development, the new concepts for PAs management was worked out by IUCN during World Conservation Strategy in 1982. It emphasized the interdependence between conservation and development. Similarly, experience on species conservation and sustainable use made the professionals to realize that conservation is for the people and the local people are to be involved right from the planning to implementation and monitoring stages. This led Nepal to change its conservation policy from government-managed and preservation-oriented to community-managed sustainable approaches. Establishment of KMTNC and initiation of ACAP are the two important landmarks for the people centred conservation initiatives in the country.

Together with this shift in approach, legislations, policies and bylaws governing biodiversity were amended couple of times to maintain proper balance between conservation and development. Various provisions were made in the bylaws of NPWCA 1973 to accommodate local need and practices like allowing local people to collect forest products for domestic purposes and encourage rotational grazing under Himalayan Park Regulation. Similarly in the Tarai, local fishing communities were allowed to fish for their subsistence living and controlled collection of grass and other materials by local people. The BZ regulation made provisions for diverting 30 to 50 percent of park revenue to BZ for biodiversity conservation and community development programmes. Similarly, Conservation Area Regulations envisaged management of natural resources in CAs through CBOs.

Under this new approach, three different models of conservation and development are currently implemented in different PAs. These are summarized in the following paragraphs.

Integrated conservation and development model: Pioneered by the ACAP and supported by WWF, the model is applied in all the CAs of Nepal. This approach considers people as an active partner for conservation programme rather than perceiving them as passive beneficiaries. Aimed at integrating conservation and development through the people's participation, the model makes CBOs like Management Councils, UCs, UGs and Mother Groups an integral to natural resource management system in CAs. At the grassroots level, people are authorized to use the resources conserved by them based on their management decisions. Based on the experiences and lessons leant from ACA management, the Integrated Conservation and Development Programme (ICDP) model are replicated in different projects and programmes which includes Manaslu Conservation Area Project (MCAP), Kangchenjungha Conservation Area Project (KCAP), Bardia Integrated Conservation Project (BICP) and Biodiversity Conservation Centre (BCC).

Joint management model: MBNP championed this model. It seeks to demonstrate how people can manage national parks even without the presence of RNA. This approach regards local people as the managers of the park in contrary to the existing practice of strict protection by the army.

Community based buffer zone management model: As a strategy to mitigate the adverse impact of growing conflicts between the parks/reserves and the people around through increased participation of local communities in biodiversity conservation, UNDP supported Park and People Programme (PPP) promoted this community based conservation model Under this model, partnership between park/reserve management authority and CBOs is forged.

The DNPWC executes BZMP through BZMC. Under the 1993 amendment of NPWCA 1973 and the Buffer Zone Management Regulations 1997, BZMC is empowered to protect and manage the natural resources in the BZ. In this endeavour, thirty to fifty percent of park revenue is diverted to BZ for its management programme.

Integration of communities, conservation and development represents a promising approach toward successful PA management. Based on the success story of ACAP, almost all the projects implemented during the late 1990s and early 2000s are based on these approaches, although some variants in terms of programme activities and institutional arrangements can be seen across projects and programmes. While people's representation in project management is sought through Conservation Area Committee in ACA, MCA and KCA, they are represented through BZMC in RCNP, RBNP, SPNP, LNP, SNP and MBNP.

Major strengths of the above approach are:

- Recognizes peoples as the partner for conservation and place them at the centre during all stages of conservation initiatives
- Ensure collaboration with local people in management of the park and conservation of species
- Reduce enforcement expenditure through effective biodiversity conservation
- Change relation between park/reserve and people from that of conflict to cordial relationship
- Enshrine democratic governance to ensure sense of security and stability
- Develop alternative opportunities of livelihoods
- Holistic, integrated and conservation in line with sustainable development

Some weaknesses of this approach are:

- More tilted towards the development than conservation as most of the programmes are focused on development
- Little emphasis given to conserve the biodiversity outside the PA network

2.4.3 Eco-region/landscape approach

Although ICDP approach of PA management for biodiversity conservation has proven effective in addressing small sets of large number of conservation issues inside the PAs, it turned out less effective in maintaining the viable population of endangered wild animals and plant species outside PA network, which are often ignored. Therefore, a pragmatic approach of biodiversity conservation was felt necessary to accommodate wide-ranging conservation issues even outside the PAs network. This realization gave rise to eco-region based conservation/landscape approach currently adopted under and supported by WWF Nepal Programme under the Tarai Arc Landscape (TAL) Project.

Eco-region based/landscape approach is new in biodiversity conservation. An eco-region is relatively large unit of land or water that is biologically distinct with characteristics set of species, ecosystems and ecological processes. Since, eco-region boundaries are determined biologically rather than politically, thus they are more flexible and less precise than political boundaries and are subject to change overtime as information accumulates. The TAL intends to restore and manage the degraded forest corridors and maintain links between PAs within the TAL and dispersal corridors through community forestry, plantation and natural forest regeneration by strengthening CFUGs.

Major strengths of the above approach are:

- Boundaries are ecologically determined rather than politically and are subject to change over time as information accumulates
- Emphasis on areas outside the PAs as well as trans-boundary areas covering a large area
- Diverse range of stakeholders and builds partnerships
- Attempt maintaining balance between the conservation and development

Being a new approach, its weaknesses are yet to be seen. However, major challenge of the above approach in the context of Nepal lies in the effective management of PAs and their corridors with no or little practical experience.

2.5 Conservation Sector Programmes and Projects

This section is devoted to the presentation of brief summary highlighting the major features of important and most recent conservation related projects and programmes implemented by DNPWC either on its own or in collaboration with or through other conservation partners in PAs. To the extent available programmes implemented in WSs are also covered. In presenting the brief summary, efforts have been made to focus on implementation modality. Strengths and weaknesses are summarized at the end for a comparative view. With further details in **Annex 7**, the second section of Chapter 3 presents the effectiveness of the programmes and projects reviewed on biodiversity conservation and poverty reduction.

2.5.1 Protected areas

The DNPWC is a lead agency for many biodiversity sector related programmes implemented in the protected areas. Organizationally, the DNPWC is responsible for the conservation of the biodiversities in PAs and the management of the BZ designated by HMG/N in accordance with the NPWCA, 1973 and relevant regulations. Organizations like KMTNC, UNDP and WWF Nepal Programme are its collaborator and/conservation partners assisting in the management of some PAs. First the projects following ICDP approach are discussed and then by those following landscape approach **(Attachment 2 Table 6).**

Annapurna Conservation Area Project (ACAP)
The ACAP was launched in 1986 at Ghandruk as a pilot programme to integrate nature conservation with community development. With successful pilot testing, and following its formalization through gazette notification in 1992, ACAP's programme was extended to cover the entire Annapurna area. Implemented by KMTNC, it is divided into seven conservation units and each unit is managed following ICDP approach through a network of CBOs comprising of UGs and Conservation Area Management Committees formed at each conservation units.

Northern Mountains Conservation Project (NMCP)
The WWF Nepal Programme started this programme in 1996 to conserve biodiversity and support community development in SPNP and its BZ, and DHR. It is implemented in collaboration with the DNPWC with the financial support of USAID. Following ICDP approach, conservation and development activities are implemented through a network of CBOs formed along BZ regulations and comprise BZMC, Conservation Committees and UGs.

Bardia Integrated Conservation Project (BICP)
Implementation of BICP was initiated in 1996 to promote biodiversity in and around the park by strengthening the capacity of local organizations and institutional capacity building of DNPWC. The project with five components related to conservation and development is implemented with the funding support of the government of the Netherlands through WWF Nepal Programme. Following ICDP approach, conservation and development activities are implemented through a network of CBOs formed along BZ regulations and in partnership with KMTNC and an NGO called Women in Environment.

Sagarmatha Community Agro Forestry Project (SCAFP)
Recognizing the importance of conservation outside the SNP, WWF Nepal Programme Program initiated the Sagarmatha Community Agro-Forestry Project in 1996 with the cooperation of the DOF. All the forests adjoining the Park were brought under the community forestry system with the active participation of the local communities especially women user groups. Upon declaration of the BZ in SNP, which was realized, with the active lobbying of the women UGs, the CBOs were transferred into the BZ system in accordance with the BZ regulations and guidelines.

Bardia Conservation Programme/Bardia Research Project (BCP/BRP)
This project was started in 1997 by DNPWC and KMTNC with the technical support of the Agriculture University, Norway and financial support of Norwegian government channelled through NORAD to develop wildlife research projects in RBNP. Implemented by KMTNC with the support of park staff, this project included the same five components of the BICP. This project has been adopting the ICDP approach of conservation and development following BZ regulations through a network of BZ community organizations. BRP is a follow up of BCP with a focus on wildlife research.

Manaslu Ecotourism Development Project (MEDP)
Based on ACAP experience that conservation and development can be mutually complementary to each other in meeting both the environmental concerns and basic needs of local people, KMTNC initiated MEDP in the Manaslu region of the Upper Gorkha in 1997. The project is implemented under the loan assistance of the Asian Development Bank to HMG/N under Second Tourism Infrastructure Development Project. Following ICDP approach implemented in ACAP, the project is implemented through a network of CBOs comprising of UGs and CAMCs.

Buffer Zone Development Project (BZDP)
This project started in 1997 and managed jointly by CARE Nepal and DNPWC with funding from CARE Denmark. The project aimed at improving the livelihood of BZ communities through participatory forest management and biodiversity conservation, is implemented through a network of CBOs comprising of UGs, UCs and BZMC following ICDP approach.

Kangchenjungha Conservation Area Project (KCAP)
HMG/N and WWF Nepal Programme launched the KCAP in 1998 to safeguard the biodiversity of the area. In particular, the project seeks to institutionalize and strengthen CA management by economic empowerment of community members, and increase conservation awareness among all stakeholders. The CBOs like Management Council, UCs, UGs and Mother Groups are integral to natural resource management in the CA.

Upper Mustang Biodiversity Conservation Project (UMBCP)
The ACAP has been active in this region, through the Lomanthang Unit Conservation Office. The UMBCP is the extension of Lomanthang Unit Conservation Office facility in Upper Mustang through financial support from the agencies like GEF, UNDP, ICIMOD and KMTNC. The project builds on earlier works and experiences of ACAP with greater emphasis and linking tourism and local economy with overall biodiversity conservation. Implemented along ACAP modality, the project has introduced an innovative approach of partnerships and co-financing.

Tourism for Rural Poverty Alleviation Programme (TRPAP)
This programme is being implemented in and around the five protected areas namely Taplejung outside KCA, SNP, LNP, SPNP and in Chitwan linking RCNP. The programme is funded jointly by UNDP, SNV and DFID. The SNP component is implemented by DNPWC, and the other components are implemented by MoTCA and respective DDCs. The programme was convened in 2001 and will continue till 2006 with its goal of contributing towards poverty alleviation through sustainable tourism. Its approach is to mobilize local CBOs but under the umbrella of DDC by forming district tourism coordination committee, developing model physical facilities for rural tourism, and refining grassroots micro and small enterprise skills.

Participatory Conservation Programme (PCP)
Started in 2002, the Participatory Conservation Programme (PCP) is a follow up of the PPP implemented by DNPWC with the assistance of UNDP. This programme seeks to institutionalize the successes and achievements of PPP approach, which emerged as a strong and viable vehicle in forging effective partnership between the government and local people for collaborative conservation undertakings in PAs. The focus of this programme is on the establishment of BZ Development Division within the DNPWC, review of BZ policy, capacity development of PA staff and the local

communities and up-scaling social mobilization activities in the BZs. PCP is also to continue support HGMN in implementing the BZ management programme in the 7 PAs.

Tiger Rhino Conservation Project (TRCP)
KMTNC through its RCNP based Biodiversity Conservation Centre (BCC) has been implementing the project in the Barandabhar corridor forest that links the RCNP with the foothills of the Mahabharat range in the north. Started in 2001 with the financial support of GEF, UNF and UNDP, it builds on the experience of KMTNC and DNPWC on tiger and rhino monitoring. Aiming at the establishment of community based conservation model, it uses the KMTNC's experience of participatory ecotourism project that established community forests in Baghmara in 1990s. The project also aims to mobilize women and promote indigenous knowledge.

Tarai Arc Landscape (TAL)
The Department of Forests (DOF), DNPWC and WWF Nepal Programme have jointly implemented the TAL in collaboration with local communities and NGOs, following Grant Agreement between the MoFSC, HMG/N and WWF Nepal Programme on 13 July 2001. With its two components separately executed by DOF and DNPWC, the project aims to maintain the linkage between the PAs (PWR, RCNP, RBNP and RSWR) through the ecological corridors of natural forests. Under this project, transboundary cooperation between the protected area authorities of Nepal and India has been fostered. It aims to materialize the landscape conservation strategy through public participation.

2.5.2 Wetland sites

Aforementioned discussions illustrate that PAs have been externally supported in varying extents. But WSs at present have virtually no external support. They are used by different organizations for different purposes. When wetlands are inside the PAs such as BTRS or a part of PA network such as lake Rara, lake Tilicho, lake Gosainkunda, KWR, they receive support of DNPWC, otherwise wetlands would hardly receive any support from any organization despite their economic and biodiversity significance.

Since last year, HMG/N and IUCN Nepal have designed a project to promote the conservation and sustainable use of Nepal's wetlands with UNDP-GEF funding support. The overall goal of the proposed project is to ensure the maintenance and enhancement of wetland biodiversity and environmental goods and services for improved local livelihoods in Nepal. This proposed project will address the root causes of wetland loss and degradation by increasing focus on wetland conservation and wise use in the national policy and planning framework, strengthen institutional, technical and financial capacities, develop and implement economic incentives for wetland conservation and demonstrating replicable models of collaborative wetland management. The project will undertake work at two demonstration sites: the KWR and its proposed buffer zone in Eastern Nepal, and the Ghodaghodi Lake Complex in Far Western Nepal.

The project will further support the establishment of an inter-sectoral National Wetlands Committee to ensure that wetland conservation is incorporated in government policies and actions. The Committee to be supported by thematic sub-committees will identify issues, and enhance mechanisms for cooperation.

2.6 Lessons Learned and Conclusions

While mid-Hills have the greatest ecosystem diversity in Nepal, the review shows insufficient representation of this region in the PAs system. Presently, Mountain region has the highest number of PAs, followed by Tarai and the least in the mid-hills. Likewise, in terms of area coverage also, mountain region exceeded Tarai and the Mid-hills. However, the number of ecosystems represented in PAs is only 80 out of 118, and with respect to phyosiographic zones, it is 15 out of 23 in Tarai Siwaliks, 33 out of 52 in the mid Hills, and 30 out of 38 in the Mountains, and 2 out of 5 in the others (BPP, 1995).

Because increasing human pressures have led to alteration and degradation of wetland ecosystems, causing reduction or loss in their biodiversity, their ecological functions, and economic, cultural and spiritual values, wetlands have not only become some of Nepal's most threatened habitats but also have been overlooked as an important habitat type. Many wetlands are now suffering from land and water pollution while others have been drained and converted to agricultural land.

In Nepal, policy and strategy are broad enough to effectively manage biodiversity on the one hand and reduce poverty on the other as to the spirit of the Tenth Plan. Hence, major problem is not the lack of policy but lack of enforcement in terms of their weak and delayed implementation. When there is national policy, there is no legal framework as in the case of National Wetland Policy or the NBS. Likewise, if there is Act, the government has been delaying to issue necessary rules or bylaws to effectively implement the legislation as in the case of Aquatic Animals Protection Act 2017. Following the pressure from environmentalists, this Act was revised after 38 years for protecting declining or deteriorating indigenous fishes, but the government has shown no priority to issue the respective rules. The case of SWCA, 1982 is not different from this.

As per the Nepal Treaty Act, HMG/N is bound to implement conventions and treaties, which is a signatory. However, implementation of the convention's provision in Nepal is loosely addressed in terms of patchy works not because Nepal does not know her obligations but because there is no institutional commitment to translate commitments into actions. While availability of necessary policy and legislation is an opportunity to work in the present scenario, further expedition to formulate necessary rules and bylaws is urgently required not only to fulfil its international commitments and treaties, but also to integrate the biodiversity conservation and development and thereby contribute significantly to the poverty reduction goal of the country. As Nepal is a party to more than 25 international conventions and treaties, it is now high time to assess not only the importance and relevance of those treaties in the changed context and identify contradictions/similarities among treaties, but also it is necessary to examine which of the treaties have been already supported or backed by necessary legislations and which are still waiting for such Acts and Rules. The proposed study will also be useful in achieving the coordination among different stakeholders particularly among line ministries, which is one of the most important factors making difficult for timely promulgation of necessary Act and bylaws to support convention and treaties.

Legislations, policies and bylaws have been amended couple of time to maintain balance between conservation and development. Various provisions have been made in bylaws to accommodate local need and practices e.g. Himalayan park regulation allows local people to collect forest products for domestic purposes and encourage rotational grazing, similarly in the Tarai local fishing communities are granted permission to collect fish for their subsistence living, and park allows local people to collect grasses for certain number of days in a year. The government has introduced the BZ concept. whereby 30 percent to 50 percent of the park revenue is ploughed back into the community for its development. In due course of time, with many years of implementing policing type of conservation. the government has even learned the need to integrate the conservation and development and put people at the centre of conservation.

Since previous efforts to manage PAs without the support of the resident local population were not altogether successful, Nepal has pioneered the concept of people's involvement in PAs management and has already shifted its conservation policy from government-managed and protection-oriented approach to community-managed sustainable approaches. With early emphasis of species preservation and research and beginning with "fortress" styled management system, DNPWC has already shown its confidence in community based management strategy. This is an opportunity, which the promising donors like JICA can utilize while assisting biodiversity conservation sector. In the past, it would have been very difficult to make the technical staff of the DNPWC ready to adopt people-centred approach in the conservation of biodiversity. Now the situation is different. The importance of putting people at the centre of conservation and development has now been realized by all the stakeholders and Nepal's commitments and efforts have been recognized not only at the international forums, but also at the national, districts and PA levels.

3. Review Analysis of Protected Areas and Wetland Sites

The purpose of this chapter is to present findings of the review analysis carried out across all the 16 PAs of Nepal and 10 WSs of Nepal's Tarai. This chapter is organized into three sections. The first section is devoted to the presentation of major works carried out so far in PAs and WSs, efforts directed towards systematic management, management modality, major obstacles and gaps, major lessons learned and assessment of PA and WS management on biodiversity conservation and poverty reduction. The second section brings out review findings of SABIHAA modality of participatory resource conservation and poverty reduction implemented in western Nepal under JICA Nepal cooperation. The third section then focuses on the analysis of implementation modality adopted under various ongoing and recently completed programmes and projects in the biodiversity conservation sector together with their relative effectiveness in biodiversity conservation and poverty.

3.1 Major Findings from the Review Analysis

3.1.1 Past research efforts

From various sources a total of 867 research reports and documents related to PAs and WSs of Nepal were listed. Of the 867 items listed, 438 or about 50 percent provided information on biological aspects, 150 items or about 17 percent on socioeconomic aspects, 225 items or 26 percent on policy/legislation and the remaining 54 items or 6 percent on conflict related issues. Of the 438 reports listed, 211 were focused on species, 102 on habitats and 125 provided general information about species as well as habitats (Table 1).

Table 1. List of literatures related to PAs and WSs

Category	Number of Items Listed
1. Biodiversity	438
1.1 Species	211
1.2 Habitat	103
1.3 General	124
2. Socioeconomic	150
3. Policy/Programme/Legislation	225
4. Conflicts	54
Overall (Total)	**867**

Of the total reports/documents listed, 797 or about 91 percent were related to PAs and remaining 9 percent to WSs. A simple look at these figures indicated that WSs have not been sufficiently researched in Nepal unlike PAs. However, the list when disaggregated by individual PAs and WSs, a different picture emerged. In the case of PAs, the number of available reports/documents was limited to 10 or below for five PAs (about 31 percent), 11 and 20 for two PAs (about 13 percent), 21 and 30 for three PAs (about 19 percent) and greater than 31 for 6 PAs (38 percent). Of all PAs, while RCNP, KWR, SNP, RBNP and ACA happened to be the highly researched ones, LNP, MBNP, and RSWR were moderately researched and remaining are least researched. Within this last category, the situation of PWR, RNP, SPNP, KNP, ShNP, DHR, KCA and MCA appeared very weak (Table 2).

From the distribution of the documents presented in the above table, it appeared that research in PAs is relatively biased towards the biological aspects. This apparent picture changed when the available reports/documents were disaggregated by PAs except for those PAs that are relatively more researched. For example, reports/documents focused more on biodiversity aspects shared some 61 percent of total PAs specific reports in respect of RCNP, SNP, RBNP, RSWR and KWR, which are more researched. This percentage is only 40 percent in respect of other PAs that are less researched.

Table 2. Protected Areas and number of literatures and research coverage

Protected Areas/Wetland Sites	Areas of Enquiry							
	Biodiversity							
	Genera	Habita	Species	Sub-total	Socio-economy	Conflict	Policy/ Programmes/ Legislations	Total
A. Protected Areas								
Royal Chitwan National Park	12	10	72	94	15	20	18	**147**
Langtang National Park	4	1	4	9	9	1	8	**27**
Sagarmatha National Park	8	9	7	24	23	4	17	**68**
Rara National Park	2	2	4	8	0	0	2	**10**
Shey Phoksundo National Park	7	3	2	12	3	0	2	**17**
Khaptad National Park	2	1	2	5	1	0	4	**10**
Royal Bardia National Park	9	6	20	35	5	8	12	**60**
Makalu Barun National Park	8	2	4	14	11	1	9	**35**
Shivapuri National Park	5	3	0	8	8	2	6	**24**
Royal Shuklaphanta Wildlife Reser	3	4	18	25	0	1	4	**30**
Koshitappu Wildlife Reserve	7	18	26	51	8	7	4	**70**
Parsa Wildlife Reserve	2	0	3	5	1	0	4	**10**
Dhorpatan Hunting Reserve	2	2	2	6	0	0	0	**6**
Annapurna Conservation Area	12	0	8	20	27	6	28	**81**
Kangchenjungha Con. Area	7	0	0	7	3	0	2	**12**
Manaslu Conservation Area	0	0	0	0	3	0	1	**4**
Across PA	8	5	1	14	7	1	38	**60**
Others	19	10	28	57	16	3	50	**126**
Total	**117**	**76**	**201**	**394**	**140**	**54**	**209**	**797**
B. Wetlands								
Ghodaghodi tal	2	4	6	12	0	0	3	**15**
Bishazari tal	1	1	0	2	0	0	1	**3**
Jagadishpur Reservoir	0	1	0	1	0	0	1	**2**
General Wetland Site	4	21	4	29	10	0	11	**50**
Total	**7**	**27**	**10**	**44**	**10**	**0**	**16**	**70**
Grand Total	**124**	**103**	**211**	**438**	**150**	**54**	**225**	**867**

In the case of wetlands, the technical bias was more evident. Reports dealing more with biodiversity aspects shared some 63 percent of the total reports listed. This proportion rocketed high to a level of 75 percent when reports/documents dealing with general wetlands, which in general covered all aspects, were excluded. **Annex 2** presents the documents listed and categorized as explained above.

3.1.2 Research coverage and significance

Using the SALOGC approach in each five areas of enquiry, detail profile of all the sixteen PAs and 10 WSs were prepared. These were then analyzed to identify issues and research and implementation gaps and to generate information required to prioritize and select PAs and WSs for detail field study. While **Annex 4 and 5 provide** details on review findings of PAs and WSs respectively, salient findings of the review covering 13 different aspects are elaborated in the following sub-sections. In summarizing the findings, attempts have been made to highlight those aspects/issues, which are directly related to the objectives of the review. Areas reviewed included age of PA/WS, number of research carried out, neglected areas of research, existence or otherwise of management plan and strategic framework documents, etc. Similarly, implementation status of management plan and strategic framework, main implementing agency including donors/projects supporting/implemented, implementation modality, participation of dependent population in management, major lessons learned, gaps and impacts on biodiversity conservation and poverty reduction have also been covered.

Age *versus* research coverage

Since PAs were established at different points in time, an effort was made to analyse different aspects like age of PA, number and type of documents prepared and published, etc. The review revealed the followings:

- No uniformity across PAs is observed in terms of preparation of basic documents like management plan, strategic framework document, etc,
- A positive and relatively strong relationship between the age of PA and number of research carried out (measured through available reports/documents) is observed.
- The information available on research coverage varied from PA to PA and even on some basic aspects. For example, among the NPs, biodiversity aspects were relatively less covered in LNP, RNP, KNP, PWR and DHR, which are relatively more researched and are 17 years old and above.
- In general, RNP, SPNP, KNP, ShNP, DHR, KCA and MCA are less researched than others and available information on these PAs is limited.

Table 3: Relationship between age and research carried out and weak areas of research coverage of PAs and WSs

Particulars	Year established	Age of PA/WS	Number of research carried out	Weak areas of research
Protected Areas				
Royal Chitwan National Park	1973	31	147	None
Langtang National Park	1976	28	27	Conflict
Sagarmatha National Park	1976	28	68	Conflict
Rara National Park	1976	28	10	All (specially on conflict and socioeconomic)
Shey Phoksundo National Park	1984	20	17	All (specially on conflict, socio-economy and management)
Khaptad National Park	1984	20	10	All
Royal Bardia National Park[21]	1976	28	60	Socio-economy, conflict
Makalu Barun National Park	1991	13	65	Conflict
Shivapuri National Park[22]	1984	20	24	Conflict, species
Royal Shuklaphanta Wildlife Reserve	1976	28	30	Socio-economy, conflict, management
Koshitappu Wildlife Reserve	1976	28	70	None
Parsa Wildlife Reserve	1984	20	10	All
Dhorpatan Hunting Reserve	1987	17	6	All
Annapurna Conservation Area[23]	1992	12	81	None
Kangchenjungha Conservation Area	1997	7	12	All
Manaslu Conservation Area	1998	6	4	All
Wetland Sites				
Ghodaghodi Tal		NA	5	Conflict
Bishazari Tal			2	
General Wetland Sites			53	

In general, literature on wetlands was limited (not considering KWR). Of the 70 different literatures documented in respect of wetlands, 50 dealt with general wetlands and only 20 being specific to certain wetlands[24]. Number of studies conducted on specific WS is very limited. Recently, IUCN has

[21] RBNP was gazette notified in 1976 as WR

[22] ShNP was gazette notified in 1984 as WR

[23] Although initiated in 1986, ACA was gazette notified in 1992.

[24] The first attempt to conduct systematic study on wetlands was initiated by HMG/N in 1995 through support from BPP and this study explored 51 wetland sites in the Tarai and found 36 wetland sites to be significant from biodiversity conservation perspective. This was then followed by IUCN's initiative in 1998 wherein a detail inventory of 163

prepared a 10-year project for wetlands covering two demonstration sites: Koshitappu and Ghodaghodi, both of which are Ramsar Sites. As per NBS 2002, detail and systematic study of wetlands covering biodiversity (flora, fauna and habitat) and socioeconomic aspects is still awaited.

Planning for conservation and poverty reduction

Although the first legislation to protect Nepal's wildlife dates back to 150 years when the then Prime Minister Jung Bahadur Rana restricted hunting of certain animals, the importance of biodiversity conservation through systematic planning was first recognized in the 1950's in the country's first Five Year Plan. However, required legal basis to promote biodiversity conservation came only in 1973 when NPWCA 1973 was enacted and RCNP was established (HMGN/MoFSC, 2002). Since then, 16 different PAs have been established. In this process NPWCA, 1973 have been amended four times, the latest amendment being made in 1994 to include BZ policy.

Until 1992, the sole objective of establishing PAs was to conserve the flora and fauna including their habitats and thereby help conserve biodiversity. With the gazette notification of ACA in 1992 and of BZ concept in 1996, the objectives of biodiversity conservation also shifted towards poverty reduction consideration.

Simple declaration of certain area as PAs does not necessarily lead to conservation. What is required is a long-term vision, strategies and plans to guide efforts toward conservation and other goals like poverty alleviation. In this respect, review was first focused on examining whether or not Management Plans reflecting such vision and strategies have been prepared and secondly on assessing the implementation status of such plans. The outcome is summarized in Table 4.

Table 4: Status of management and implementation efforts in PAs and WSs

Protected Areas/Wetland Sites	Existence of Management Plans (PAs/WSs)				Species Action Plan	Implementation Status
	Strategic framework	PAs /WSs management	Buffer Zone	Tourism		
Royal Chitwan National Park	Yes	Yes	Yes (E)	Yes (NE)	Yes	H
Langtang National Park*	Yes	Yes	Yes (E)	Yes	Yes	M
Sagarmatha National Park	Yes	Yes	Yes (NE)	Yes (NE)	Yes	H
Rara National Park*	Yes	Yes	No	No	Yes	L
Shey Phoksundo National Park	No	Yes (NE)	Yes (NE)	Yes (NE)	Yes	H
Khaptad National Park	Yes	No	No	No	No	NA
Royal Bardia National Park	Yes	Yes	Yes (E)	Yes (E)	Yes	H
Makalu Barun National Park	No	Yes	Yes (NE)	No	Yes	L
Shivapuri National Park	No	Yes (NE)	No	No	No	L
Royal Shuklaphanta Wildlife Reserve	Yes	Yes (NE)	No	No	Yes	M
Koshitappu Wildlife Reserve	Yes	Yes (NE)	No	No	No	M
Parsa Wildlife Reserve	Yes	Yes (NE)	No	No	Yes	M
Dhorpatan Hunting Reserve*	No	Yes	No	No	Yes	L
Annapurna Conservation Area	No	Yes	NA	No	Yes	H
Kangchenjungha Conservation Area	No	Yes (NE)	NA	Yes (NE)	Yes	H
Manaslu Conservation Area	No	No	NA	No	Yes	NA
Wetland Sites	No	No	NA	No	No	L

Notes: * Old; E =Endorsed, NE = Not Endorsed, NA = Not Applicable H = High M = Medium and L = Low

Wetland sites in Tarai and 57 sites in the hills was prepared. This further updated in 1998 itself by relevant photographs, sketches and nomenclatures of flora and fauna. IUCN's latest work provided brief profiles of wetland covering biodiversity, socioeconomic, conflict, and programme and policy aspects.

Strategic framework analysis for PAs is a recent phenomenon exercised in terms of building local perception, needs and priorities in the management of resources through design of management plans. This exercise has not been carried out uniformly across all PAs. PAs not having such framework included SPNP, MBNP, ShNP, DHR and all the three conservation areas. Although management plans have been developed for almost all PAs except for KNP, MCA and ShNP, these are yet to be endorsed and implemented for a number of PAs like SNP, SPNP, RSWR, KWR, PWR and DHR. While buffer zone management plan has been fully endorsed for RCNP, LNP and RBNP; management plans prepared for SPNP and MBNP are still to be endorsed. For others such plans have not been prepared yet. However, plans for PA specific symbolic species management have been prepared for all PAs except KNP and KWR. Species specific plans have been prepared for tiger, snow leopard and rhinoceros.

Implementation levels of the management plans have also varied across PAs depending upon the available resources, which is also tied with donor support. In relative terms, implementation of management plans is rated high for RCNP, SNP, SPNP, RBNP, ACA and KCA, and rated low for DHR, ShNP, MBNP, and RNP where significant donor support are lacking.

In the case of wetlands, preparation of management plans or similar documents was almost not existence except for GTRS, Gaindahawa Tal and JRRS. Even for these three wetlands, implementation has not started yet.

Programme administration, management modalities and people's participation

Across the PAs, five different modalities of programme administration and four modalities of management were observed. Refereeing to sub-section 2.3.1 for details, Table 5 summarizes these along with level of participation.

Table 5: Administrative and programme management modalities across PAs and WSs

Protected Areas/Wetland Sites	Administrative modality (*)					Programme modality (**)				Level of participation (1)
	1	2	3	4	5	1	2	3	4	
Royal Chitwan National Park	✓								✓	M
Langtang National Park	✓							✓		M
Sagarmatha National Park	✓							✓		M
Rara National Park		✓						✓		L
Shey Phoksundo National Park	✓							✓		M
Khaptad National Park		✓						✓		L
Royal Bardia National Park	✓								✓	M
Makalu Barun National Park			✓			✓				M
Shivapuri National Park		✓				✓				L
Royal Shuklaphanta Wildlife Reserve		✓							✓	L
Koshitappu Wildlife Reserve		✓						✓		L
Parsa Wildlife Reserve		✓						✓		L
Dhorpatan Hunting Reserve				✓		✓				L
Annapurna Conservation Area					✓		✓			H
Kangchenjungha Conservation Area			✓					✓		H
Manaslu Conservation Area					✓		✓			H
Wetland Sites										NA

* Implies five administrative modalities explained above, and

** Implies the four programme management modalities explained above

Level of people participation was assessed in terms of involvement of the people in PA management. Level of participation and people's role in decision-making differed with the type of PA. Higher level of participation was observed in 3 PAs (ACA, KCA and MCA) as they are managed under the Conservation Area Regulations. The medium level of participation was observed in 6 PAs (RCNP,

RBNP, SPNP, LNP, MBNP and SNP) as these PAs are managed as per the BZ policy. Low level of participation was observed in 7 PAs, which included (ShNP, RNP, KNP, PWR, KWR, RSWR and DHR). **Annex 7** provides further details on implementation modalities.

Major obstacles reported in PA management

A number of obstacles have been reported in the management of PAs across the country. These are summarized in Table 6. Several obstacles reported are common across the PAs studied (**Annex 4**).

Table 6: Major obstacles/threats reported in the management of Protected Areas

Areas of Enquiry	Major Obstacles	
Biodiversity	• Alien species invasion • Changing course of river • Flood • Grassland succession • Illegal trade in wildlife products • Inbreeding suspected • Natural and intentional forest fire • Over fishing • Pollution • Uncontrolled and competitive grazing • Vandalism during resources extraction • Wetland conversion/invasion • Wetland poisoning	• Cross breeding with domestic livestock • Geophysical barrier • Haphazard stone/sand quarrying around park • High human pressure on park resources • Illegal harvesting of NTFPs • Inadequate number of water holes • Landslide/erosion • Poaching • Problems in elephant and rhino management • Smaller size of the PA • Unclear management zones • Wildlife movement outside park boundary
Socio-economy	• Closer to the city or airport • Existence of roads and industry near the PA • High tourist flow • Inadequate forest resources outside the PA • Low literacy rate • Low public awareness • Poor infrastructures like trails, bridges and schools • Poverty • Settlements inside PA	• High inflow of immigrants • Low involvement of women in decision making • Maoist insurgency and political instability • Open access • Poor health and sanitation facility • Remoteness • Uncontrolled growth of hotels and lodges • Unemployment of youth
Management	• Ineffective coordination with DDC and VDCs • Inadequate field staff • Inadequate incentives for field staff • Inadequate trained and skilled human resources • Limited fire fighting capacity • Boundary dispute	• Inadequate support programmes like agricultural, forestry, livestock improvement • Inadequate communication equipment • Inadequate security posts • Low level of resources • Database not organized
Policy/ Legislation	• Existing Acts and Regulations do not address aquatic life and Ramsar Sites sufficiently • Policy to bridge Ramsar Site and PAs more pertinent to KWR and RCNP • Unclear institutional mandate for Ramsar Site management	• Anti-poaching and anti vandalism strategy not updated • Less practical management regulation • Not effective enforcement of IEE and EIA • Poor monitoring and evaluation • Inadequate coordination among authorities and organizations

* Note: The case of wetland is irrelevant for lack of any significant management efforts made so far.

Major gaps in PA management

A number of gaps have been reported in the management of PAs across the country. These are summarized in Table 7. As in the case of obstacles, several of the reported gaps are common across the PAs covered (**Annex 4**).

Table 7: Major gaps reported in the management of Protected Areas

Area of Enquiry	Major Gaps	
Biodiversity	• Absence of zoning of PA • Inadequate visioning and planning for conservation of species • Wildlife corridor not existing	• Inadequate promotion of game hunting • Inadequate research and monitoring • Inventory of major flora, fauna including NTFP not being carried out
Socio-economy	• Inadequate conservation awareness	• Inadequate documentation of indigenous knowledge
Management	• Absence of umbrella management council • Inadequate coordination among authorities and organizations • MIS lacking in implementation • Opportunity cost of overlooked drift wood and NTFP	• Absence of Management Plan • Institutional framework for tourism development not existing • Management Plans not endorsed in 7 PAs • Need to revise management plans in several PAs • Proposed extension not implemented in case of RBNP
Policy/Legislation	• Buffer zone not declared yet in 3 PAs although ad-hoc UCs and UGs have been formed • CITES bill not endorsed yet • Inadequate implementation mechanism for EIA • Insufficient legislation pertaining to endangered plant species • Need revision in Schedule I of NPWCA, 1973 • No specific legal provisions in Acts and Regulations for recently formulated polices • No specific policies on compensation for damages/causalities by problem animals • Tourism plan not formulated in several PAs and plans prepared but not endorsed in 3 PAs	• Appropriate research protocol to be formulated • Code of conduct for building construction in WHS not found • Endorsement of antipoaching strategy not yet done • Hunting Reserve Regulation/Guideline not framed • Ineffective tourism policy • Policy on harvesting and marketing of medicinal plants lacking • Policy on landscape level management and biological corridors yet to be made clear • Policy on management of orphan and problem animals lacking • Review of current legislation and policies • Tri-national peace park policy not formulated (KCA)

Major lessons learned from PA management

The lessons learned from the management of PAs from the review of PA related documents are summarized in Table 8 by areas of enquiry. As is evident from the table, several of the reported lessons are similar across the PAs. **Annex 4** highlight lessons leaned under each PA.

Table 8: Major lessons learned in the management of PAs*

Area of Enquiry	Major Lessons Learned
Biodiversity	• Alternate resources especially grazing land is necessary • Emphasis on landscape approach for management of mega species • Habitat improvement through weed elimination and indigenous grass species plantation • Improper burning of grasslands cause changes in its composition • Increasing pressure on the wetlands may lead to exhaustion of the resources • Rotational cutting and control burning of grasslands during dry season should be practiced • Smaller wooded grassland and *phantas* should be created within the surrounding *sal* forests • The topographically rugged and relatively open boundary are causes of poaching
Socio-economy	• Abundantly available resources can be used to enhance local economy • Direct and visible benefits are motivating factors for changing people attitude towards conservation • Eco-tourism is important for sustainable revenue generation • Local culture is a promoting factor for conservation • Public humiliation, imprisonment and financial punishment are effective for poaching control • UGs are the most appropriate and effective grassroots organizations to independently shoulder local initiatives in the BZs
Management	• Provision of BZ is essential for park management • Concerted efforts of multiple organizations generates synergy in poverty alleviation • Highly ambitious and short duration tourism project is ineffective • ICDP is replicable with community participation • There should be manageable number of UGs/UCs for their sustainability • Needs sound database system • Provision of innovative training and education opportunities to local people is helpful in conservation • Staff security is necessary for effective management • Well organized CBOs are important for extraction of benefit from the PAs
Policy/ Legislation	• Pollution control is possible by the joint efforts and by policy implementation • Required separate management strategies for wildlife reserve and Ramsar site viz in the case of KWR • Specific species action plans essential for important species
Conflict	• A clear demarcation is necessary to minimize land use conflicts in the BZ • Political support is important for the effective PA management

* The case of wetland is irrelevant for lack of any significant management efforts made so far.

Major obstacles and gaps reported across WSs

From the review of 10 WSs of the Tarai, a number of obstacles and gaps have been identified in respect of conserving the biodiversity and sustainable management of wetland resources. Most of the obstacles and gaps reported are common for all the WSs reviewed. Reported obstacles and gaps are summarized in Table 9 with site details in **Annex 5.**

Table 9: Major obstacles and gaps reported in Wetlands

Major Obstacles	Major Gaps
• Natural and cultural eutrophication • Alien species invasion • Dependency on the natural resources • Draining and drying up of water sources • Encroachment and forest clearance • Excessive fishing including exploitation of rare, endangered and monogeneric species • Flooding, landslide and erosion • Human population increase • Hunting • Organic accumulation and siltation • Over grazing • Pollution • Unplanned constructions and developmental activities	• CITES bill not yet been endorsed • Gap in the information on encroachment • Inadequate conservation awareness • Legal jurisdiction of the Ramsar Site is not clear • Management of wetland not been recognized in the periodic plans including the current Tenth Plan • Management plan not implemented • No clear demarcation of the wetland site • No conservation measures initiated in some • No detail inventory • No specific legal provisions of the recently formulated conservation policies • No tangible programmes on conservation and development • Not yet been developed from tourism perspective • Species not fully protected under existing legal system

3.1.3 Impact on biodiversity conservation and poverty reduction

Assessed impact of different programmes implemented in PAs following different implementation modalities on biodiversity conservation and poverty reduction using a set of proxies is presented in Table 10. The impacts on biodiversity are judged based on observed/reported changes in the number of PA specific symbolic species. Review findings indicated positive contribution of PA management towards the biodiversity conservation as has been evident from increased population and sightings of symbolic species in all the PAs, irrespective of their type. For example, tiger populations have increased in PWR, RCNP, RBNP and RSWR; rhino populations in RCNP and RBNP; *Arna* and birds in KWR; musk deer in SNP and all mountains PAs; and leopard, wild boar and black bear in the PAs across the country.

In the absence of specific studies carried out to assess the poverty impacts of programmes implemented in PAs, a number of proxy indicators were used to measure the poverty impacts. These included levels of community development activities carried out outside PAs, park revenue flow back to the community and presence of poverty related projects. The community development activities carried differed with the type of the PAs, age of the PAs, significance of PAs and presence of conservation partners. In case of community development, 6 PAs (ACA, KCA, MCA, RCNP, SNP and RBNP) were rated high; 5 PAs (LNP, SPNP, RSWR, KWR and PWR) were rated medium and 5 PAs (RNP, MBNP, KNP, ShNP and DHR) were rated low.

Flow back of park revenue to local community is reported to have direct impact on poverty reduction because these amounts are utilized for the community development and income generating activities. Level of flow back of the park revenue to the community differed with the type of the PAs and the prevailing management modality. Revenue flow back to the community was high in 3 PAs (ACA, MCA and KCA) because 100 percent of park revenue was diverted to the community as per the Conservation Area policy. Similarly, revenue flow back was medium in 6 PAs (RCNP, LNP, SNP, SPNP, MBNP and RBNP) as these PAs have delineated BZ under which 30 to 50 percent of park incomes are invested for the socioeconomic upliftment of the people living in the BZ. Remaining 7 PAs (ShNP, RNP, KNP, RSWR, KWR, PWR and DHR) have yet no system for diverting park revenue back to the community. However, revenue generation in the protected areas varies significantly.

Last indicator used to assess the impacts of PAs management on poverty reduction was the presence of the poverty focus projects aimed directly to either reduce the poverty or improve the livelihoods of

the people. Broadly, existence of the poverty related projects was classified into three groups based on number of projects directly related to poverty reduction. Six PAs (ACA, KCA, MCA, RCNP, RBNP and SNP) were included under high category as these PAs had high number of donor assisted/conservation partner programme on poverty reduction. Seven PAs (RNP, KNP, RSWR, KWR, PWR, LNP and SPNP) were included under the medium category because these were being supported either by UNDP funded PCP programme or by WWF programme or by both. Last 3 PAs (ShNP, MBNP and DHR) were included under low category, as these PAs had neither donor programmes nor conservation partners supported programmes.

Table 10: Contribution of protected area in biodiversity conservation and poverty reduction

Protected Areas/ Wetland Sites	Biodiversity conservation Increase in populations/ sightings of wildlife	Poverty reduction		
		Community development	Park Revenue flow to the Community	Poverty Related Project
Protected Areas				
Royal Chitwan National Park	Rhino, Tiger, Ungulate	High	Medium	High
Langtang National Park	Red Panda, Musk deer, Snow Leopard, Assamese Monkey	Medium	Medium	Medium
Sagarmatha National Park	Musk Deer, Snow Leopard, Red Panda, Wolf, Himalayan Tahr	High	Medium	High
Rara National Park	Black Bear, Wild Boar	Low	Low	Medium
Shey Phoksundo National Park	Snow Leopard, Musk Deer, Blue Sheep	Medium	Medium	Medium
Khaptad National Park	Leopard, Black Bear	Low	Low	Medium
Royal Bardia National Park	Rhino, Tiger, Elephant, Ungulate	High	Medium	High
Makalu Barun National Park	Black Bear, Wild Boar	Low	Medium	Low
Shivapuri National Park	Leopard, Wild Boar	Low	Low	Medium
Royal Shuklaphanta Wildlife Reserve	Swamp Deer, Tiger, Ungulate	Medium	Low	Medium
Koshitappu Wildlife Reserve	Bird, *Arna*	Medium	Low	Medium
Parsa Wildlife Reserve	Tiger, Ungulate	Medium	Low	Medium
Dhorpatan Hunting Reserve	Blue Sheep, Himalayan Tahr, Barking Deer	Low	Low	Low
Annapurna Conservation Area	Snow Leopard, Black Bear	High	High	High
Kangchenjungha Conservation Area	Snow Leopard, Blue Sheep	High	High	High
Manaslu Conservation Area	Snow Leopard, Blue Sheep	High	High	High
Wetland Sites	Not applicable			

3.1.4 Selection of priority protected areas and wetland sites

Using a set of eight criteria provided in **Attachment 3 Table 1**, 16 PAs covered by the study were evaluated and prioritized first against individual criterion and then by combining all the criteria together. Relative rank of PAs thus arrived indicated the relative importance of these PAs and WSs in terms of requirement of external interventions. Relative rank of PAs and WSs thus arrived are presented in Table 11 with details in **Annex 1.**

In the relative ranking of PAs, KWR and LNP ranked at the top two priorities, ShNP and ACA in the third priority. Since the criteria considered were guided by the twin objectives of conservation of natural resources and poverty reduction, the first two PAs (KWR and LNP) automatically qualified for selection. In the case of third PA, between the two PAs with equal ranking, ShNP was prioritized because ACA was supported by KMTNC and because ShNP is the only PA located in the middle hills of Nepal.

Table 11: Ranking of Protected Areas based on all criteria simultaneously

Protected areas	Biodiversity significance	Conservation significance	Poverty significance	Economic significance	Conflict significance	Program assistance	Partnership significance	Global significance	Overall Score	Overall rating
Royal Chitwan National Park	1	2	2	2	3	1	1	3	15	V
Langtang National Park	3	2	3	2	2	3	1	2	18	II
Sagarmatha National Park	1	2	2	1	1	2	1	3	13	VII
Rara National Park	3	2	3	1	1	3	2	1	16	IV
Shey Phoksundo National Park	2	2	3	1	1	3	1	2	15	V
Khaptad National Park	2	1	3	1	1	3	2	1	14	VI
Royal Bardia National Park	1	2	2	1	3	2	1	3	15	V
Makalu Barun National Park	3	2	1	1	2	3	2	2	16	IV
Shivapuri National Park	2	2	2	3	1	3	3	1	17	III
Royal Shuklaphanta W. Reserve	2	2	1	1	3	2	1	2	14	VI
Koshitappu Wildlife Reserve	3	2	2	2	3	3	2	2	19	I
Parsa Wildlife Reserve	1	2	3	1	2	3	2	2	16	IV
Dhorpatan Hunting Reserve	1	2	2	1	1	3	3	1	14	VI
Annapurna Conservation Area	3	3	1	2	3	3	1	1	17	III
Kangchenjungha Conservation Area	2	2	1	1	1	3	1	3	14	VI
Manaslu Conservation Area	3	1	1	1	1	3	1	1	12	VIII

Source: Annex 1

As in the case of PAs, using a set of seven criteria provided in **Attachment 3 Table 2,** 10 WSs covered by the study were evaluated and prioritized first against individual criterion and then by combining all the criteria together. Relative rank of WSs thus arrived indicated the relative importance of these WSs in terms of requirement of external interventions. Relative rank of WSs thus arrived are presented in Table 12 with details in **Annex 1.** In the relative ranking of WSs, JRRS ranked at the top of the priority. BTRS, GTRS, Gaindahawa Tal, Deukhuria Tal, Badahiya Tal, Nakhrodi Tal, Rampur Tal, Patriyani Tal, and Betkot Tal follow it respectively. Considering the conservation and poverty reduction significance through collaborative management of WSs, the first three high-ranking WSs were selected for field study.

Table 12: Ranking of WSs based on indicators used to select priority WSs for detail field study

Wetland Sites	Biodiversity significance	Conservation significance	Poverty significance	Socioeconomic significance	Conflict significance	Partnership significance	Global significance	Overall score	Rank
Betkot Tal	1	2	1	1	2	4	0	11	VIII
Patriyani Tal	1	2	5	3	2	1	0	14	VII
Rampur Tal	1	3	5	4	2	1	0	16	VI
Nakhrodi Tal	3	2	5	4	2	1	0	17	V
Badahiya Tal	2	3	5	4	3	1	0	18	IV
Deukhuria Tal	1	3	5	5	3	1	0	18	IV
Gaindahawa Tal	2	2	4	4	3	2	3	20	III
Bishazari Tal Ramsar Site	5	1	1	4	2	5	5	23	II
Ghodaghodi Tal Ramsar Site	4	1	5	3	2	4	5	24	I
Jagadishpur Reservoir Ramsar Site	4	2	5	4	2	2	5	24	I

Source: Annex 1

3.2 Review of SABIHAA Modality and Replication Implications

The SABIHAA model of community development for sustainable management of watershed resources was developed by the Community Development and Forest/Watershed Management Project supported by JICA and implemented in Kaski and Parbat district and is currently being replicated in Syangja district. The model was first reviewed based on available documents and then observed in the field to assess its relevancy for possible replication in PA and WS management.

Considering the spirit of NBS 2002, and the recent policies of managing PAs by NGO or other organizations, two fundamental components of SABIHAA can be integrated in the management of PA/WS. These are:

- Ward Conservation Committee as an umbrella structure for grass root UGs, and
- POWER (Poor People, Occupational Caste and Women's Empowerment for Resources Management) as a tool of empowerment for the people whether affiliated with UGs or not.

Based on the review of SABIHAA modality vis a vis modalities being implemented in PAs/WSs and the baseline survey conducted in the six selected sites (BTRS, GTRS, JRRS, KWR, LNP and ShNP), following inferences have been drawn up with details presented in **Annex** 6.

1. Replication of WCC by consolidating the existing user groups in the PAs/WSs where stakeholders communities are organized under legal structures

   There are 9 PAs and 1 WS where user groups exist under the regulations pertinent to CA or BZ, such as ACA, KCA, MCA, RCNP, RBNP, SPNP, LNP, MBNP, SNP and BTRS. There are 3 PAs where ad-hoc user groups have been formed by proposing BZ, such as in KWR, PWR and RSWR. Similarly, there are UGs on water, forests and other resources formed under various legislations in some WSs that merit for legal protection, for example water UGs in JRRS. Provision of WCC in the regulations or the pertinent legislations will smooth the process of replication.

2. Replication of WCC by organizing UGs in the PAs where stakeholder communities are not yet organized under any legal structure

   There are 4 PAs where stakeholder communities are not organized into UGs since BZ has not yet been declared or proposed. They are ShNP, RNP, KNP and DHR. SABIHAA replication will be possible in these PAs when BZ is materialized along with WCC provisions. Similarly, there are WSs where UGs are not yet organized. In both the cases, formation of UGs and WCC can be promoted for biodiversity conservation and poverty reduction. A special provision of forming UGs and WCC has to be made in the PAs till BZ is materialized.

3. Replication of POWER as an empowerment tool

   The concept of POWER group as conceived and encouraged by SABIHAA is a special programme designed to empower those who are generally bypassed by development interventions aimed at natural resources conservation and poverty alleviation. It can thus be promoted as an empowerment tool at the grass roots level across the user communities in PAs and WSs where participatory conservation efforts are planned or underway. In BZ where settlement based UGs have been organized even for poor, *dalits* and women, POWER can be a strong and sustainable tool to bring these people in the development mainstream aimed at biodiversity conservation[25]. In PAs and WSs where BZ has either not been formalized or not been thought of integration of BZ and Power is necessary for participatory conservation.

[25] For lack of permanent source of income, POWER concept is evading even in those districts where it has been replicated like in Syangja. This concept if integrated in BZ would have greater sustainability through regular resource inflows from PA generated resources.

SABIHAA's WCC model can be integrated in the BZ system to organize hundreds of BZ UGs into a manageable size first at the ward level and then at the VDC level. It will however require redefinition of the BZ boundary to encompass all wards of a VDC, and reorganizing or forming BZ and UCs at the entire VDC level[26]. This approach will bring consistency between BZ system, LSGA and SABIHAA, since it maximizes strengths and minimizes weaknesses of the three systems.

With this approach, the existing UGs that number in thousands will come under the umbrella of WCC and becomes manageable from programme planning, implementing and monitoring perspectives. WCC integration will help for more realistic planning and institutional link with VDC/DDC plans for synergetic effects in conservation and development. Since WCC conforms to the LSGA, it will minimize conflicts with the DDC/VDCs. It will help enhance transparency and foster higher level of community participation especially of DAG and poor people. Along with encouragement of the local communities, WCC integration will contribute for ward capacity building. Replicating SABIHAA implies formation of WCC under existing VDC level conservation committee.

Integration of POWER group will add value to the strategy of encouraging community participation in biodiversity conservation in and around the PAs/WSs ensuring equity and gender perspectives. This will ensure the active participation of the poor, occupational cast and women who are deprived from the mainstream of conservation and development programmes. Since POWER is sustained with adult literacy, close supervision by motivators and financial supports by the project management, it creates a favourable environment for the deprived people who are left out during the process of forming UGs or UCs. However, local situations should be considered while replicating POWER.

While integrating the SABIHAA concepts of WCC and POWER in the PA/WS management, some factors should be considered as alerts. To discourage dependency syndrome among the UGs and UCs formed under SABIHAA, they should be linked with common property resources as in the case of BZ or community forestry. Continued monitoring should be ensured under line agency institutional structure and management system upon completion of a project. Programme planning guidelines should be clearly designed to avoid any political bias.

3.3 Effectiveness of Implementation Modality of Donor Supported Programmes and Projects

In this sub-section, thirteen major donor assisted projects/programmes have been reviewed to assess their operational modality; strengths, weaknesses and effectiveness in biodiversity conservation, conflict minimization and poverty reduction. This section is organized into three sub-sections. First an overview of major donor assisted projects and programmes in PAs are presented. Second, sub-section dealing respectively with the assessment of strengths and weaknesses of programmes and projects in terms of biodiversity conservation, conflict minimization and poverty reduction is then presented. The last sub-section then assesses the overall effectiveness of the programmes and projects reviewed. Of the 13 projects reviewed, three projects namely BICP, BZDP and NMCP have already been phased out.

3.3.1 Overview of the programmes and projects

With details in **Annex 7,** Table 13 provides a brief overview of the thirteen projects reviewed with details in. Most of the projects reviewed covered only one PA. However, PCP, TAL and TRPAP cover 7, 4 and 3 PAs respectively. All the projects implemented in PAs have dual objectives of biodiversity conservation and poverty reduction except for TRPAP, which aims alleviating poverty through policy review and formulation, and strategic planning for sustainable tourism development. These projects have adopted two distinct administration modalities for delivery of the services. The first one includes the NGO implementation modality as that of KMTNC. This is presently adopted in

[26] For example, all the 37 VDCs touching the RCNP should be brought under the BZ system, and the current number of 21 BZ UCs should be reorganized into 37 BZ UCs in conformity with VDCs.

ACAP, MEDP, UMBCP, BCP/BRP, (TRCP), etc. The second modality includes the partnership or joint management model followed under PCP, KCAP, NMCP, SCAFP, etc. The KMTNC has followed this approach across all its projects where as other donors such as UNDP and WWF have implemented the programmes under the joint management framework or partnership with DNPWC. All the projects have made provisions to ensure participation of people either directly or indirectly in management. For example, ACAP, MCAP, and KCAP involve people through CAMC and PCP involves them through BZMC. Though most of the projects have formed their own beneficiary groups, TAL mainly works with or supports to existing groups to develop their capacity and provide very minimal/limited support towards the formation of new group.

Table 13: Overview of programmes and projects reviewed

Project/ programme	Coverage	Emphasis on*	Administration modality	Mode of People's participation
PCP	PWR,KWR,RSWR, RCNP,RBNP,RNP,KNP	BC, PR	Joint (DNPWC/UNDP)	BZMC
ACAP	ACA	BC, PR	NGO/KMTNC	CAMC
MEDP	MCA	BC, PR	NGO/KMTNC	CAMC
KCAP	KCA	BC, PR	Joint (DNPWC/WWF)	CAMC
SCAFP	SNP	BC, PR	Joint (DNPWC/WWF)	BZMC/CFUG
NMCP	SPNP	BC, PR	Joint (DNPWC/WWF)	BZMC
BICP	RBNP	BC, PR	Joint (DNPWC/WWF)	BZMC
BCP/BRP	RBNP	BC, PR	NGO/KMTNC	BZMC
TAL	PWR,RCNP,RBNP,RSWR and outside PAs	BC, PR	Joint (DNPWC/DOF/WWF)	BZMC/CFUG
UMBCP	ACA	BC, PR	NGO/KMTNC	CAMC
BZDP	RBNP	BC, PR	Joint (DNPWC/CARE)	BZMC
TRPAP	SNP component	PR	Joint (DNPWC /UNDP)	Community organizations
	LNP, SPNP	PR	Joint (MoTCA/DDCs/ UNDP)	Community organizations
TRCP	RCNP, BTRS	BC, PR	NGO/KMTNC	BZMC/CFUG

* Note: BC: Biodiversity Conservation, PR: Poverty reduction

3.3.2 Biodiversity conservation

Assessment of strengths and weaknesses of programmes/projects in terms of biodiversity conservation is based on the absence or presence of programmes activities such as anti-poaching, species conservation, forest management, alternative energy promotion, habitat management, conservation education and MIS establishment and the extent of their implementation. Referring to **Annex 7** for project specific assessment of strengths and weaknesses, Table I4 below summarizes the strengths and weaknesses of the various projects reviewed. Of the projects implemented in PAs, TRPAP has the least or no programmes directly related to the biodiversity conservation, hence is very weak. The projects adopting ICDP model such as PCP, ACAP, BZDP, etc also have weak components of the biodiversity conservation. These projects have given more emphasis on development than on conservation and whatever programmes have been implemented; they are either weak or poorly implemented. However, the exceptions are WWF's TAL and KMTNC's BCC/BRP. They have strong components of biodiversity conservation such as anti-poaching, species research and monitoring, habitat management and are being strongly implemented in the field. On the other hand, TAL, TRCP, KCAP have strong biodiversity conservation components like species monitoring, research, translocation of species, antipoaching operations and have adopted landscape approach to biodiversity conservation. Of the current projects reviewed, majorities have emphasized to alternative energy and conservation education components, which are their strengths. However, MIS establishment have been very weak in most of the projects excepting PCP, NMCP, BICP, TRCP and BZDP.

Table 14: Strength and weakness of programmes/projects reviewed on biodiversity conservation

Project/ programme	Antipoaching	Species conservation	Forest management	Alternative energy	Habitat management	Conservation education	MIS establishment
PCP	W	W	M	M	M	S	S
ACAP	W	M	S	S	W	S	W
MEDP	W	W	M	M	W	S	W
KCAP	S	M	S	S	W	S	M
SCAFP	N	N	S	M	N	M	W
NMCP	S	S	S	S	W	S	S
BICP	S	S	S	M	S	S	S
BCP/BRP	W	S	M	S	M	S	W
TAL	S	S	S	S	S	S	S
UMBCP	M	M	W	S	S	S	M
BZDP	N	N	S	S	N	M	S
TRPAP	N	N	N	N	N	N	W
TRCP	S	S	S	S	M	S	S

Note: S = Strong: W = Weak: M = Moderate N: None

3.3.3 Conflict minimization

Assessment of strengths and weaknesses of programmes/projects in terms of conflict minimization is based on the nature of their relationships with beneficiaries, mechanism of coordination or collaboration with line agencies/peer groups in programme implementation and presence or absence of wildlife damage mitigation measures and compensation provisions. As seen in Table 15, all the projects have strong inbuilt mechanisms of intra- programme coordination or networking e.g. TAL have formed community forestry coordination committee, ACAP have formed the Conservation Area Committee, PCP has formed the BZMC. This has not only reduced internal conflicts related to ownership, participation, benefit sharing but also resulted into planned and integrated development efforts. The inter programme coordination has been duly addressed in the programmes/projects and is one of their major strengths. For example TAL which has formed the coordination committees from central to field level, PPP/PCP, BZDP, BICP and BCP/BRP implemented in RBNP have even divided the programme VDC to avoid the duplicity of programmes and resources as well as to simplify coordination. Almost all the projects implemented in national parks such as PCP, NMCP, TAL, BICP, BZMP, BCC/BRP have strong wildlife damage control and mitigation components for the minimization of conflicts. These projects are not only supporting livelihood diversification activities of the locals but also assisting them to construct physical structures such as trench and fence etc to reduce the wildlife damages. The damage mitigation/control component is weak in projects implemented in conservation areas such as ACAP, MCAP, SCAFP, etc. However, none of the projects provides direct monetary compensation for the wildlife damage.

3.3.4 Poverty reduction

Based on the detail review of the projects, indicators were developed to assess their strengths and weaknesses in terms of poverty reduction. The indicators developed included formation/strengthening of CBOs, community capital formation, skills and capacity development, livelihoods diversification, community development, tourism promotion, heritage conservation, local resource management support and natural hazard reduction. Most of the projects/programmes have strengths and have significant impacts on poverty reduction by either reducing the vulnerability of the people or enhancing and maintaining their livelihood assets. Although the projects have adapted different approaches of conservation such as ICDP or landscape, their central emphasis has been on poverty reduction. Referring **Annex 7** for details, strengths and weaknesses of each programme/project

assessed are summarized in Table 16. Review indicated that all projects have contributed to poverty reduction but with variations. In general, poverty impact was high in ACAP, BCP/BRP, PCP and BICP; it was moderate in MEDP, SCAFP, NMCP UMBCP and TRPAP and low in other projects,

Table 15: Strength and weakness of programmes/projects reviewed on conflict minimization

Project/ programme	Intra programme coordination/ networking	Inter programme coordination/ line agencies	Wildlife damage mitigation measure	Wildlife damage compensation
PCP	S	M	H	N
ACAP	S	W	M	N
MEDP	S	W	W	N
KCAP	S	S	W	N
SCAFP	S	M	W	N
NMCP	S	S	S	N
BICP	S	S	S	N
BCP/BRP	S	S	S	N
TAL	S	S	S	N
UMBCP	S	M	S	N
BZDP	S	S	S	N
TRPAP	S	S	N	N
TRCP	S	M	W	N

Note: S = Strong: W = Weak: M = Moderate N: None

Table 16: Strength and weakness of projects reviewed on poverty reduction

Project/ Programme	CBO formation/ strengthening	Community capital generation/ endowment fund	Skill and capacity development	Livelihoods Diversification/ IGAs	Special target group programmes	Community/infrastructure development	Heritage conservation	Tourism management	Local resource management support	Natural threat minimization
PCP	S	S	S	S	M	M	M	W	M	S
ACAP	S	M	S	S	S	S	S	S	S	W
MEDP	S	M	M	M	S	M	S	S	W	W
KCAP	S	M	S	M	W	W	W	W	M	W
SCAFP	S	M	M	S	S	M	M	M	S	N
NMCP	S	S	S	S	W	M	S	W	S	N
BICP	S	W	S	S	S	S	M	M	S	W
BCP/BRP	S	S	S	S	S	S	M	M	S	N
TAL	M	W	S	S	M	M	W	N	M	S
UMBCP	M	M	M	M	M	M	S	S	S	W
BZDP	M	S	S	S	M	S	N	N	S	N
TRPAP	S	S	S	S	W	M	S	S	W	N
TRCP	M	M	S	S	W	W	W	W	S	N

Note: S = Strong: W = Weak: M = Moderate N: None

3.3.5 Effectiveness of the project

The overall effectiveness of the project has been assessed in terms of their contribution to biodiversity conservation, conflict minimization poverty reduction by combining all the indicators used and by assigning scores. Results summarized in Table 17 indicated that TAL and TRCP were the most effective projects in biodiversity conservation as they had adopted landscape approach of biodiversity conservation even outside the PA network and had effectively implemented the programmes related to

species conservation and habitat improvement. ACAP approach has been highly effective to reduce poverty level of people. This model has been replicated and followed by others projects and PAs as well. In terms of conflict minimization, BICP approach has been highly effective which had not only implemented programmes in collaboration and coordination with its peer groups but also supported communities to construct wildlife damage control measures. In general, ICDP approach followed by BICP and NMCP seemed highly effective in achieving the dual goal of poverty reduction and biodiversity conservation. Based on the success of ICDP, PCP also adapted the same approach in Tarai PAs

Wetlands at present have virtually no external support. In the recent past, HMG/N and IUCN Nepal have designed a project to promote the conservation and sustainable use of Nepal's wetlands with UNDP-GEF funding support. The overall goal of the proposed project is to ensure the maintenance and enhancement of wetland biodiversity and environmental goods and services for improved local livelihoods in Nepal.

Table 17: Overall effectiveness of the programmes/projects reviewed

Project/programme	Biodiversity conservation		Poverty reduction		Conflict minimization		Overall	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
BICP	20	II	24	III	9	I	53	I
NMCP	19	IV	22	V	9	I	50	II
BCP/BRP	15	VI	25	II	9	I	49	III
TAL	21	I	19	IX	9	I	49	III
PCP	14	VII	24	III	8	VI	46	V
ACAP	14	VII	27	I	4		45	VI
UMBCP	16	VI	22	V	6	VII	44	VII
TRCP	20	II	17		5		42	VII
KCAP	17	V	17		6	VII	40	VIII
BZDP	11	IX	19	IX	9	I	39	IX
MEDP	11	IX	22	V	4		37	X
SCAFP	8		22	V	5		35	XI
TRPAP	1		22	V	6	VII	29	XII

Note: Based on decoding of ratings provided in table 4, table 5 and table 6 of Annex 6
Source: Annex 6

3.4 Lessons Learned and Conclusions

Review of available literature on PAs and WSs revealed that PAs and WSs have been disproportionately covered by research and development activities. While WSs are less researched and have almost none to minimal coverage, coverage of PAs both in terms of number of research carried out and subject matter covered appeared highly variable. In general, extent of research and development activities carried out within the PAs varied with their age determined by their year of establishment, no such relationship was obvious between age and focus of research and development activities. Variations were also observed in terms of existence of certain basic documents like Management Plan and Strategic Framework documents required to systematize biodiversity conservation and poverty alleviation efforts. In addition, objective of PAs in terms of conservation and poverty alleviation varied. While some PAs had both of these objectives, several others had only conservation objective.

The review also revealed several obstacles and gaps in the effective management of PAs and WSs. While some of the gaps and obstacles like low public awareness and poor coordination are external to the PA system demanding better coordination among and collaborative with local stakeholders for

their minimization and rectification, others like low staffing and absence of management plan are internal to the systems and would require seeking management solutions from within the PA system itself. Similarly, some of the gaps and obstacles reported like excessive flooding, absence of wildlife corridor and grassland succession are natural requiring safeguard measures, many others are man made arising either out of weak enforcement of existing policies and legislation or from lack of such policies and legislation.

Programmes implemented in PAs either through donor support or through HMG/N's own resources have resulted into positive impact in biodiversity conservation reflected by increased population and sightings of PA specific symbolic species. Likewise, evaluation of PAs using a set of proxy indicators of poverty indicated high poverty impact in six PAs (RCNP, SNP, RBNP, ACA, KCA and MCA), moderate poverty impact in two PAs (LNP and SPNP) and low impact in eight PAs (RNP, KNP, MBNP, ShNP, RSWR, PWR, and DHR). In general, poverty impact remained relatively high in PAs following ICDP model of conservation and development.

Use of a set of eight criteria in the case of PAs and seven criteria in the case of WSs in prioritizing PAs and WSs appeared relevant as these led to selection of those PAs (KWR, ShNP and LNP) and WSs (BTRS, JRRS and GTRS) that are rich and diverse in biological resources, have no or limited external support, entail issues pertaining to conflicts, reflect different management modalities and provide fair representation of ecological representation in the case of PAs.

From the review of SABIHAA modality and management modalities of PAs and WS, it is inferred that different components of SABIHAA can be replicated in PA and WS management to empower those who are generally bypassed in conservation efforts and ensure equitable participation of all sections of society in natural resources conservation.

With the support of several donors channelled though different programs and projects, different management modalities have been tested across PAs resulting into different impacts on biodiversity and poverty. In general, PAs managed following preservation approach had better biodiversity conservation impact without any significant positive poverty impact, PAs following integrated conservation and development modalities like PCP, despite being less inclusive, had positive impacts both on biodiversity conservation and on poverty reduction. This modality can be made more effective by integrating pro poor programs like 'POWER' implemented under SABIHAA, a model of community development through participatory management of natural resources.

4. Survey Findings

4.1 Koshitappu Wildlife Réserve and Ramsar Site

4.1.1 Location

The KWR is situated within 26°33'57"-26°43'40''N latitudes and 86°55'15"-87°05'02"E longitudes while the proposed BZ extends further at 86°53'41"-87°06'32"E longitude and 26°33'58"-26°43'42''N latitudes. It occupies an area of 175 sq km (149.6 sq km as per GIS studies, 2000) and extends roughly 16.3 km north south and 9.3 km east west including the Koshi alluvial floodplain spread over Saptari, Udaypur and Sunsari districts[27]. The southern boundary of the Reserve runs parallel to the Koshi Barrage, 6.5 km to the south bordering the Bihar State of India. It is 2.6 km northwest from the E-W highway and approximately 57 km west of Biratnagar by road, the second largest city of Nepal. A proposed 173 sq km BZ of KWR is distributed partially or totally over 16 VDC of the 3 districts and 49.6 sq km submerged land between the barrage and the southern boundary of the Reserve called '*duban*'. The *duban* is leased to Indian Government for 199 years under the Koshi Project Agreement of 1954.

4.1.2 Status of biodiversity

The KWR harbors the gene pool of the only remaining population of wild water buffalo (*Arna*) in Nepal and is an aquatic biodiversity hotspot supporting a very high density of fish (>200 species), resident and migratory birds (flocks over 20,000) in the region. It supports about 45 percent of total vertebrate species of the county (IUCN 1998b). In the Reserve 461 species of birds have been recorded of which 5 are protected, 45 species of herpetofauna are thought to occur including 3 protected species including the *gharial* crocodile; 200 species of fishes of which 9 are threatened; 31 species of mammals of which 6 are protected including the dolphin and transient population of wild elephant. It is the only area in Nepal where water cock (*Gallicrex cinerea*) and Abbot's babbler (*Trichastoma abbotti*) are known to occur (Inskipp, 1989). Bird species in the Reserve also include 114 species of water birds, representing almost all the species known to occur in Nepal (DNPWC, 2002).

According to the BPP 1995, five types of ecosystems occur in KWR with a diverse assemblage of 514 species of flora. Six species of plants are listed in different threat categories and appendices of IUCN and CITES respectively. Of the total species, 502 belong to 99 families of flowering plants and 12 belong to 11 families of Pteridophytes. The flowering plants account for 13 percent and 4.7 percent of the total flowering plants recorded for the Tarai and the country respectively (WMI/IUCN 1994). The wetlands of the Reserve include both lentic and lotic water systems in the form of rivers and streams, floodplains, oxbow lakes, riverine marshes, seasonally flooded lands and swamp forests. These wetlands have very high breeding potential for the migratory birds and fishes. The wetlands of proposed BZ includes about 25 km transect from Koshi Barrage to Rajabas of Sunsari district in the east and Koshi Barrage to Trijuga river bank in the Tapeswori VDC of Udayapur district in the west and north west. These wetlands are used for irrigation, fishing, grazing, ritual, domestic purpose, fodder, transport and harvesting plant resources.

As per LRMP, 1992, land use pattern of KWR includes grassland (67.3 percent), water body and river (25.9 percent), open forests (4.2 percent), savannah (2.6 percent) and cultivated land (0.1 percent). In the proposed BZ, agriculture land predominates (69.0 percent) followed respectively by by grassland (14.4 percent), riverbed (14.3 percent), orchard (0.5 percent) and swamp (1.8 percent). There are no forestlands (KWR, 2002).

[27] The Koshitappu wetland site is formed by the construction of Koshi barrage between the Nepal - India border and construction of the upstream earthen embankment up to Chakarghatti on both sides of the river in 1954. It is meant for flood control, irrigation water supply and hydropower development.

Threats
The major threats across the flora and fauna include excessive grazing by large herds of transient and resident livestock, poaching and over fishing, crossbreeding between the domestic and wild buffalo, changing course of Koshi River and blocking of fish migration due to Koshi barrage, etc.

4.1.3 Socioeconomic status

In this section, socioeconomic significance of KWR has been assessed based on available secondary information supplemented by characteristic features of households (HHs) drawn from HH survey data. Summary of HH survey information is furnished on **Attachment 4 Table 1** with details in **Annex 8.**

Users
There are around 125,749 people settled in 25,092 HHs in the proposed BZ (CBS 2001). These people are impacted by and dependent on the Reserve for fishing, grazing of livestock and collection of thatch, fodder and firewood. Out of 16 proposed BZ VDCs, 11 are highly dependent on wetlands while the remaining 5 VDCs are less dependent and use the wetland primarily for watering their livestock.

The other categories of users are also important for KWR. Around 3,000 livestock are estimated to reside permanently in the reserve. Besides, a large flock of transient livestock and herders (from as far as India) depend on the reserve for grazing and watering. Collectively, these animals pose serious competition to the reserve wild animals for food and are potential source of disease transmission and cross breeding[28]. In addition, 50 houses are still located inside the western embankment due to lack of clarity of the western boundary of the reserve (DNPWC, 2002b).

Demography
Households around KWR are distributed as large (22 percent), small (44 percent) and landless (34 percent)[29] and as Brahmin, Chhetri and Newar (BCN) caste (18 percent), ethnic caste (47 percent) and occupational caste (35 percent)[30]. The HHs around KWR have an average family size of 7.8 persons among the UG member and 5.8 among the non-UG (NUG) member HH with slightly more females than males. HH size varies by economic class and social groups. This study has observed a tendency to have larger family among economically and socially better HHs. Irrespective of type, literacy among family members is 47 percent with slightly higher literacy among the males (58 percent) compared to females (37 percent).

According to the KWR Draft Management Plan, the indigenous Jhangad, Mushar, Bantar tribal groups (13.9 percent) and occupational caste (10.6 percent) comprise 24.5 percent of BZ population and are more dependent on wetland and reserve resources[31]. About one third of the population in the BZ faces food shortage. About 25 percent of the HHs is landless and 39 percent HHs have less than 0.05 ha of operated land. The above figures are consistent with the HH survey finding carried out for this study

[28] The significant conflicting situation was inadequate control of domestic animals in the reserve. There are about 16 big buffalo raisers with more than 100 domestic buffaloes in individual herd who keep their herds inside the reserve for the genetic improvement of calves. Most of the cattle have become semi-wild and difficult to be caught. There is a conflict between buffalo raiser and KWR over this issue and the phenomenon of cross breeding *Arna* with the domestic water buffalo is a serious threat on the integrity of the pure genetic content of the wild species.
[29] For the Tarai, landless implies HHs having no operated land, small implies HHs operating up to 1.02 ha and large implies those operating more than 1.02 ha but for the Hills and the Mountains small implies HHs operating up 0.52 ha and large implies HHs operating more than 0.52 ha.
[30] BCN caste includes Brahmins, Chhetries, Newars; ethnic caste includes Tharu, Rai, Limbu and occupational caste includes Damai, Sarki, Chamar, Mushar. etc
[31] HH survey indicates about 6 percent HHs dependent on fishing.

Occupations

Although not a major occupation, agriculture is one of the occupations of HHs around KWR. Around 27.6 percent of HHs in UG member category and 33.3 percent in the NUG category have agriculture as one of the important occupation. For the area being very close to Biratnagar and Dharan Metropolis, significant proportion of HHs (31 percent UG and 39 percent non-UG) depend on wage earning. Tourism related occupation is developing and some members from about 33 percent of UG member HHs and 32 percent of NUG member HHs are engaged in this occupation. Apart from these two occupations, some HHs in both the groups are also involved in small business, fishing, and holding service.

Livelihood assets

Land: Land is the primary productive livelihood asset of HHs around KWR. An average HH belonging to BZ UG operates around 0.87 ha of land as against 1.45 ha operated by NUG HHs. About 68 percent agricultural land in the proposed BZ has some kind of irrigation facilities (Mgmt Plan 2002). Obviously average size of operated land varies with economic class of HHs by definition; HHs belonging to occupational caste operate relatively less land (0.58 ha) against 1.03 ha operated by ethnic caste and 0.32 ha operated by those belonging to BCN caste.

Livestock: Livestock is another important livelihood asset of HHs. Although buffalo, cattle, goat, sheep and poultry birds are the important livestock species kept by HHs, most popular livestock reared are cattle, followed by goat and buffalo. Majorities of livestock raised are of local breed except for an average 1.5 goat of improved breed and a few He buffalo and ox for breeding purpose. An average UG member HH owns livestock worth Rs19,143 as against Rs17,563 worth of livestock kept by NUG member HHs.

Other livelihood assets: Other livelihood assets of HHs around KWR include dwelling structures, farm machinery and equipment, means of transport, communication equipment and others. All UG and NUG member HHs have their own house[32] worth about Rs13,773 among UG members and Rs18,302 among NUG members. Average value of other livelihood assets hold is Rs 22,962 among UG member HHs and Rs 9,865 among NUG member HHs.

Dependency on KWR

Energy consumption: HHs around KWR depend heavily on fuel wood to meet their HH energy requirements. Around 72 percent UG member HHs and 90 percent NUG member HHs reported using fuel wood as one of the sources of energy (but availability is limiting). Other sources of energy used are kerosene, electricity, Liquid Petroleum (LP) gas, dung cake, crop residue, and brushwood. Next to fuel wood, dependence on dung cake and kerosene is high (44 and 32 percent among UG HHs and 40 and 30 percent among NUG HHs respectively). In meeting the HH fuel wood requirement, HHs depend heavily on private sources and livestock. Of those using firewood, only 3.8 percent of UG member HHs and 14.3 of NUG member HHs reported buying fuel wood from the market and the rest resorted collecting it from different sources. On an average, one UG member HH consumes about 1 ton of fuel wood per month (around 30 *Bhari*). Because there is no good forest in and around KWR, HHs dependence on forest product is rather low. While 9.7 percent of UG member HHs resorted to KWR for grazing their livestock, about one third of the BZ population practice free grazing.

Energy saving device: Promotion of energy saving device is a programme component of BZ. HHs around KWR are observed using such devices. The energy saving devices promoted by BZ programme included Rice Husk Stove (RHS) used by about 4 percent of UG member and 10 percent of NUG member HHs respectively. Low popularity of these devices among HHs in the area is due to high cost of the devices and heavy dependence on cow dung.

[32] Despite the fact that almost 25 percent of the HHs in the BZ are landless.

Capacity enhancement
Enhancing the capacity of UG members by providing different types of training is a major component of BZ programme. Only few BZ member HHs covered by the survey reported receiving some training. Of those receiving training, majorities had received training on skill development (31.3 percent) followed by office management (21.9 percent), leadership development (18.8 percent), biodiversity conservation (12.5 percent) respectively, enterprise development (6.3 percent), gender and equity (3.1 percent) and others (3.1 percent). In general, sex wise the male and female had equal access to training but with some variations in subject specific training (on skill development 25 percent male and 37.5 percent female; leadership 31.3 percent male and 6.3 percent female; office management 25 male and female 18.8 percent).

Gender concern
By virtue of the sample and the way UGs are organized in the BZ, all HHs in the BZ around KWR have participation in local organizations with little or no gender discrimination. However, gender discrimination was observed with regard to the form of position occupied in UG/UC and in decision-making role. In terms of positions held in the local organizations, males far exceeded the females.

Equity concerns
Equity concerns have been assessed in terms of relative access of people belonging to different economic and social class to program sponsored facilities and services. In terms of representation in user groups, poor people appeared to have been discriminated in terms of access to UG, decision making positions held in UGs, sharing of benefits, access to training and adoption of program sponsored energy saving devices. In terms of representation in UGs, landless HHs had relatively low representation (25.7 percent) compared to small land holding HHs (45.7 percent) and large land holding HHs (28.6 percent). Likewise, lower proportion of landless HHs were holding decision making positions (16.7 percent), receiving benefits (nil), had access to training (6.1 percent) and adopting energy saving devices (nil) compared to HHs operating less land (44.4 percent, 18.2 percent, 49 percent and 13.6 percent respectively) and HHs operating more land (38.9 percent, 18.2 percent, 34.7 percent and 9.1 percent respectively). In terms of social class, no such discrimination was observed.

Livelihood outcome
HH's livelihood strategies to convert assets into livelihood outcomes resulted into an average annual HH income of Rs 30,574 among the UG member HHs and Rs 20,100 among the NUG member HHs. The difference in the average annual HH income between UG member and NUG member HH is due to the fact that UG member are dependent on agriculture (43 percent) and non-agriculture (57 percent) while majorities of NUG member HHs are involved in non-agriculture activities (84.6 percent).

4.1.4 Conflicts

Establishment of PAs and WSs fulfils the need of conservation, but can overlook the needs and aspiration of the people living in and around these areas. Further more, increasing wildlife population through conservation has often created conflicts between *reserve* and people. Crop damage and damage to human life are main causes of conflicts identified so far by previous studies. These issues were further investigated and verified with different stakeholders during field study in KWR. Conflict assessment and verification was done in terms of reported problems of crop raiding, livestock depredation, and threats to human beings by wildlife; incidence of offences or illegal activities inside the PAs or wetland site; relationship between the people and KWR staff; and awareness of local stakeholders towards conservation. Awareness of stakeholders was assessed in terms of their knowledge on conservation policies and regulations. Overall, small size of KWR and lack of forest resources outside its boundaries are the most important factors contributing to the *reserve* people conflict.

People versus KWR

People around KWR visit the reserve for several purposes. Irrespective of whether HHs belonged to UGs or not, about 40 percent of HHs reported visiting the Reserve for the collection of thatch grass followed by forest product (18 percent among UG members) and livestock grazing (about 12 percent among UG members). While recreation and trespassing was reported as other reasons of visit by 20 percent of NUG member HHs. This cordial relation is also supported by low proportion of HHs (below 10 percent) reporting incidences of illegal offences and further by reduced level of driftwood collection, fishing and bird trapping and increased level of local's awareness about conservation reported during FGD with a range of stakeholders.

KWR versus people

About 16 percent of UG member HHs and 10 percent of NUG member HHs reported incidence of threats to or human casualty of their family members from the wildlife. Eleven such incidences were reported last year of which four incidences were from *Arna*, five from wild boar and two from elephant. With these incidences, eight sustained serious injury and three sustained minor injury. This indicates continued conflict between people and conservation effort.

In a similar manner, some 62 percent of UG member HHs and 50 percent of NUG member HHs around KWR reported crop-raiding problems by wildlife last year. HHs reporting such incidences, on an average, faced the problem almost 1.4 times last year. The most important crop raider wildlife species reported are *Arna*, boar, and elephant and the most commonly raided crops are paddy, maize, wheat, and mustards. Livestock depredation is not a major problem in Koshitappu although it was reported by 20 percent of the NUG member HHs and the species lost were three small livestock species. The absence of large predators like tiger and very low population of leopards in KWR is the reason for low level of depredation.

Minimizing wildlife damages

Construction of physical structures such as fences and bio-fences is not common, but *machans* (traditional watchtowers) are the most commonly used methods to reduce or control wildlife damages. Although these measures are reported effective in some location, locals do not agree. Above 45 percent of the UG member HHs reported their awareness on several measures of mitigating wildlife damage initiated by the management authority. Only one-third HHs expressed these to be effective to control the animal movement outside the Reserve. Discussion with Reserve authority and others revealed that past effort to control wildlife damage through electric fence and ordinary barbed wire fencing proved ineffective.

Relationships

Since users are linked to KWR through an ad hoc BZMC, which is not functional pending formal declaration of BZ, 30-50 percent revenue has not yet been granted to the BZ. Around one third of UG member and NUG member HHs reported either good or average relationships with the reserve authority. On the other hand, some 12 percent of UG member and 30 percent of NUG member HH felt that they had nothing to do with management authority and saw no relationships.

Another observed basis of relationship between the people and management authorities was to report and complain about the wildlife damages and to ask for compensation. For failure to properly address the problems of wildlife damage by the *reserve* authority, users have virtually stopped approaching them in solving their problems. This is indicated by high proportion of users (50 percent) not approaching Reserve authority to report the problem and by the dissatisfaction expressed by those approaching the authority for not taking any actions over their complains.

Apart from people and KWR, several stakeholders were consulted in the field and their relationship examined. Table 18 presents the perceived relationships between different stakeholders including the basis of such relationships.

Table 18: Perceived relationship between different stakeholders -KWR

Relationships between	Basis of relationship	Present status of relationship
Reserve Authority and Locals	Fishing, collection of reed, fern, firewood and *khar* (thatch grass) and traditional hunting, livestock grazing, etc.	Unexpressed conflict exists and this is expected to grow if formal declaration of BZ is delayed
District Development Committee and Reserve Authority	Use of reserve resources for revenue generation and ownership	Poor coordination and misunderstanding arising out of LSGA provisions
Reserve Authority and Line Agencies	Coordination or collaboration for programme implementation	No functional mechanism exists for coordination and collaboration
Within user group	Planning, implementation and benefit sharing	No visible conflict since no reserve resources have so far been shared
Between user group	Resource sharing, collaboration and management	Although linked each other through Users Committee no direct and functional linkage exists

4.1.5 Management

This section first summarizes the management approach and modality followed in the Reserve management. This is then followed by local's recollection of past efforts made in KWR brought out during village workshops and FGDs. Issues of participation, inclusion and equity have been taken as crosscutting issues to assess the implications of planned interventions on people.

Ongoing Projects and Conservation Partners

Three major organizations have been supporting conservation and development of KWR. UNDP has been involved for the last one decade first in the implementation of PPP and then the PCP. The proposed BZ programmes are the major activities supported under the PCP/PPP until April 2004. The IUCN and Ramsar Bureau have been supporting various conservation activities in Koshitappu including biodiversity inventory, cage fisheries project and establishment of a conservation education cum museum centre at Kushaha. The IUCN/Ramsar Bureau has also supported for the preparation of KWR Draft Management Plan 2002-2007. At present, the PCP is the only donor-supported project in KWR.

Programme components, Implementation status and management modality

The PCP is the only program in KWR supported by donor. Its program components can broadly be divided into the conservation oriented and development oriented programs. Conservation orientated programme included conservation education focused at school students, visitors and the local people. The project also supports conservation and improvement of wetland habitat through cleaning and the construction of fire watchtowers. A component for the development and adoption of alternative energy and technology has been initiated such as agro-forestry plantation and ICS dissemination.

Under the development component, community mobilization, institutional development, community capital generation and human resource development are the major activities. The project has facilitated mobilization of 12,888 members (6,355male and 6,533 female) into 434-settlement level UGs (210 male UG and 212 female UG and 12 mixed UG). These UGs have been federated first into 7 UCs and one ad hoc BZMC. In the community, capital generation component Rs 113,868 had been generated only in 2002 through UG savings and Rs 6.22 million had been mobilized until December 2002. Under human resource development component, UG member skills have been enhanced through several training.

The KWR is managed primarily as a WR since 1976 under the NPWCA 1973 guided by the Wildlife Reserves Rule 1977. The *duban* area and the embankment area come under the management jurisdiction of Koshi Project, as per the Agreement of 1954. The BZ management intervention in the

proposed BZ of Koshitappu is in line with the BZ Management Regulation 1996 and Guidelines 1999. Since December 1987, the Koshitappu has been recognized as an international Ramsar Site under the Ramsar Convention on Wetlands of International Importance 1971. It is the first Ramsar Site in Nepal with policy back stopping by the National Ramsar Policy 2002. The DNPWC manages the reserve and the proposed BZ and a company of the RNA is deployed for its protection. At present community forestry and other conservation and development works in the proposed BZ is governed by the respective policy and legislations of the relevant line agencies of HMG/N and the LSGA 1999 until the BZ is formally declared. All that has been done in the area is by the joint efforts of the regular HMG/N programme and the PCP. Thus, PCP modality discussed in Annex 6 is the prevalent modality of biodiversity conservation and community development activity in this PA.

Local's recollection of efforts and impacts

The Koshitappu is formed because of braiding and meandering of the Sapta Koshi River. The area being rich in mega wildlife used to serve as a hunting ground. It is regarded as a by-product of the establishment of Koshi Irrigation Barrage soon after the dawn of democracy in 1954. Major efforts made as recalled by local stakeholders during field interaction and realized impacts of these efforts are presented in Table 19.

Table 19: Major efforts made and observed impacts - KWR

Efforts	Initiated by	Initiated year	Major impact/implication
Establishment of Koshi Barrage	Government of India	1954-1965	• Disruption of ecological and hydrological system • Increased impoundment with large area subjected to heavy flooding and siltation • Wetland site with permanent stagnating water formed
Declaration of Hunting Reserve	HMG/N	1969	• Unplanned hunting stopped and replaced by planned hunting
Declaration of Wildlife Reserve	HMG/N	1976	• Systematic effort to conserve wildlife initiated and endangered species protected.
Relocation/resettlement of people of Southern dam area	HMG/N	1979/80	• Extension of wildlife habitat • Endangered wildlife protected
Extension of KWR	HMG/N	1980	• Increased area for conservation
Gharial released in Koshi River of KWR	KWR	1982 and 1984	• increased faunal diversity
Declaration of Ramsar site	DNPWC, HMG/N	1987	• Increased commitment towards wetland biodiversity conservation
Wetland survey on random basis	IUCN Nepal	1993-1997	• Creation of informed basis for biodiversity conservation
Establishment "Koshi Tappu Wildlife Camp" lodge	Private	1994	• Planned tourism sprouted and enlarged
Wetland survey	BPP	1995	• Creation of informed basis for biodiversity conservation
Parks and People Programme launched	DNPWC/ UNDP	1995-2001	• Increased conservation awareness • Development integrated with conservation
Participatory Conservation Programme launched	DNPWC/ UNDP	2002	• Institutionalization of people participation in biodiversity conservation
Fencing – twice (wood, cement, Bamboo)	HMG/N	-	• No positive impact on wildlife damage
Construction of community noise towers and noise making	Locals	-	• Reduce to some extent the havoc created by wild elephants
Shooting of intruding buffaloes	KWR/ RNA/ BZMC	2001 and 2004	• Reduced pressure on the reserve to some extent

Efforts	Initiated by	Initiated year	Major impact/implication
			• Increased conflict between owners and KWR authority
Capture and own permit against semi wild cattle	KWR/RNA/ BZMC	2002/03	• Reduced pressure on the reserve • Increased conflict between locals for catching wrong animals
Water hyacinth removal (Biogas-hyacinth)	Local Entrepreneur	2002/03	• Reduced water hyacinth problem • Alternative energy source evolved
Preparation of KWR Management Plan	DNPWC/ UNDP/ IUCN	2002-2007	• Systematic efforts for conservation and development began
Celebration of Wetland Day	Major stakeholders	2004	• Increased awareness of local's about wetland conservation

Capacity assessment of local organizations

The CBOs formed are *ad hoc* BZMC, BZUCs and BZUGs in the proposed BZ of the KWR. They are still immature and need careful further support. Their capacity in terms of organization and leadership development, office management, saving-credit mobilization and business planning need further strengthening.

Various NGOs are working in and around KWR. Local NGOs such as Bird Conservation Network and hotel entrepreneurs in KWR have taken initiatives for bird conservation such as checklist preparation, awareness raising and protection of breeding sites by organizing bird festivals. These NGOs are well established, have institutional setup and staff, and have the capacity to facilitate conservation and development activities.

Sunsari, Saptari and Udayapur DDCs and corresponding VDCs around KWR are more aware of KWR in terms of its revenue generation potential but less so in biodiversity and are interested to link their activities with that of KWR. Although they have capacity to manage development programmes, they have little knowledge and virtually no capacity to manage conservation.

Impacts of BZ Programme

Impacts of BZ programme on biodiversity conservation assessed in terms of changes in the population of symbolic mammal and bird species indicate positive impacts KWR activities on biodiversity conservation. Available information suggested increased number/sightings of *Arna*, dolphin, roosting of resident birds (viz. swamp partridge) and migratory birds (Siberian Crane) around KWR. The *arna*, prominent species of KWR, increased from 63 in 1976 (Dahmer, 1978) to 145 in 2000 (Heinen and Singh, 2000). During discussion with the field staff of KWR and PCP, it was revealed that sighting of *Arna* calves and birds have increased. Increasing trend of bird watching tourist in the area also supported this.

This can also be inferred from more than 82 percent of HHs reporting regular sightings and 72 percent reporting an increase in population of *Arna* in and around KWR. Similarly, increased or stable population of the *Arna* and the birds of KWR indicate the positive impact of BZ programme on mammalian and avian diversity[33].

On livelihood impacts, about 40 percent of the UG member HHs and 10 percent NUG member HHs had no idea weather the impact of KWR management was positive or negative on their livelihood. However, 20 percent of UG member HHs and 16 percent of NUG member HHs reported positive

[33] As per the checklist prepared by the Bird Conservation Nepal in 2002, total number of bird species found in and around the KWR is 461

impacts and 2 percent of UG member HHs reported negative impacts without substantiating. This does not allow one to draw any firm conclusions.

4.1.6 Policy

In absence of programmes of regularly informing the users and others about policy and legislative changes including those upcoming, only 34 percent of UG members HHs reported that they were aware of existing policies and legislations on wetlands. While 80 percent of the NUG member HHS had not heard about the policies and legislations related to management of wetlands or biodiversity conservation. Even among those who reported policy and legislation awareness, they knew out of their own initiatives and their knowledge was limited to what they can do and what they cannot do.

During discussion with the stakeholders other than the HH members, it was observed that many were unaware of the Ramsar convention and the National Wetland Policy. They had misunderstandings and confusions in the interpretation of LSGA 1999 and NPWCA 1973 and BZ Regulation 1996.

4.1.7 Major problems

Several problems related to biodiversity conservation and poverty reduction in and around KWR highlighted by different stakeholders during discussions are summarized in Table 20.

Table 20: Major problems of KWR brought out by stakeholders

Biodiversity Conservation	Poverty Reduction
• BZ not yet declared despite almost 10 years support of UNDP. • Boundary is not yet clearly demarcated • Crossbreeding of domestic buffaloes with *Arna* • Increasing number of livestock inside the *reserve* • Illegal thatch (*khar khadai*) and timber collection/extraction and grazing • Illegal fishing and collection of edible plants and *pater* (mattress making grass) • Limited scientific knowledge about birds, animals and aquatic life • Overriding feelings of personal benefits • Poaching of wildlife especially wild boar	• Crop damage by wild buffalo • Cultural differences among local residents • Very few employment opportunities • Inadequate infrastructures and facilities for tourism • Limited training opportunities for skill development • Public auditing not instituted in BZMC • Subsistence living has shadowed the importance of biodiversity conservation • Insignificant media publicity of KWR for tourism promotion resulting into underdeveloped tourism

4.1.8 SWOT analysis

Strengths, weaknesses, opportunities and threats of KWR assessed through SWOT analysis is summarized in Table 21 with details in Annex 8.

4.1.9 Potential areas for external interventions

Stakeholder during consultations and village level workshops suggested several potential intervention areas for biodiversity conservation and poverty reduction. Suggested areas are summarized in Table 22.

Table 21: Analysis of strengths, weaknesses, opportunities and threats – KWR

Strengths	Weaknesses
• Gene pool of the only remaining population of *Arna* in Nepal and hotspot for aquatic biodiversity • Dual advantage and strength of a PA and Ramsar Site • Existence of a well-prepared management plan with components of reserve and wetland • Easy accessibility from all parts of country both by air and road • Growing awareness of locals about conservation in some areas • Growing initiatives of NGOs and hotel entrepreneurs in conservation	• Delays in formalization of BZ • Delays in endorsement and implementation of management plan • No harmony in conservation between the reserve and in the *Duban* area • *Dalits* and poor who suffered most from the reserve have been left out from development activities • Continued wastage of driftwood • Encroachment by *sukumbasis* (squatters) • Poor infrastructure for tourism promotion • Inadequate community cooperation • Weak enforcement of existing legislations • Inadequate research and studies • Poor coordination among different line agencies • Low level of conservation awareness in some areas
Opportunities	**Threats**
• Supportive donor communities and funding agencies • Rich local culture to link cultural tourism with bird watching, boating, *Arna* sighting • Fine location for a conservation education centre • Proposed Ramsar Demonstration site of IUCN • Availability of indigenous knowledge and raw materials • Availability of markets for the agro-products and handicrafts • Availability of community land for targeted fish culture • Possibilities to enlarge KWR ecosystem • Suitable for transboundary activities	• Encroachment from domestic livestock and transient livestock (from as far as India) increasing disease transmission and cross breeding threats • Over fishing, poisoning, poaching • Use of chemical fertilizers and pesticides • Deforestation in upstream catchments • Changing course of the Koshi River, flooding, riverbank erosion and siltation • Blocking of migratory routes of the aquatic species by Koshi Barrage • Fast encroaching weeds, such as water hyacinth • Existence of high-tension electricity line

Table 22: Potential areas suggested by stakeholders for external intervention-KWR

Biodiversity Conservation	Poverty Reduction
• Clear demarcation of the Reserve's boundary • Removing domestic buffaloes that reside inside the reserve and destroy the crops outside • Promote stall feeding practice to reduce grazing pressure • Regularize bird monitoring • Formalize BZ and implement management plan in the spirit of Ramsar Site and Wildlife Reserve	• Launch conservation and development awareness programmes • Prioritize adult education, income and employment generating activities. • Training in skill, tourism and leadership development • Allow regulated collection of driftwoods • Issue fishing license to dependent fishermen • Boating contract to the BZUC • Protect crop damage and provide relief and compensation • Launch special programs to most affected people • Increase media coverage of KWR and promote tourism

The intervention areas suggested for KWR by UG member and NUG member HHs are summarized in Table 23. Majorities of HH from both the UG and NUG group suggested income generating activities (over 24 percent) followed by skill development activities (over 23 percent), saving credit program (11.8 percent) and tourism promotion (over 9 percent). Users have given less value to the compensation/damage control, non-formal education and infrastructure development and virtually no suggestion for conservation activities.

Table 23: Intervention areas suggested by HHs for management of KWR

	User		Non user		Total	
	No	percent	No	percent	No	percent
Tourism	2	11.8	11	9.2	13	9.6
Skill enhancement	4	23.5	41	34.5	45	33.1
Income generating	5	29.4	29	24.4	34	25.0
Compensation/damage control	1	5.9	3	2.5	4	2.9
Disaster management	2	11.8		-	2	1.5
Saving and credit	2	11.8	14	11.8	16	11.8
Non-formal education	1	5.9	14	11.8	15	11.0
Infrastructure/community development		-	6	5.0	6	4.4
Others		-	1	0.8	1	0.7
Total	17	100.0	119	100.0	136	100.0

4.2 Shivapuri National Park

4.2.1 Location

Shivapuri National Park is situated between 27°45'N to 27°52'N latitudes and 85°15'E to 85°30' E longitudes. It is located at the northern side of Kathmandu Valley on the middle mountain and covers an area of about 144 sq km, stretching about 9 km from north-south and about 20 to 24 km east-west. It extends over three districts namely, Kathmandu, Nuwakot and Sindhupalchok. Twenty-three VDCs from these three districts are located around the park. Two settlements namely, Okhreni and Mulkharka villages of Sundarijal VDC and Nagi Gumba Complex of Baluwa VDC lie inside the park. Its boundary is well demarcated by 111 long km stone-wall fence and is the only walled PA in Nepal. The park headquarter is located about 12 km north of Kathmandu metropolis and the Tribhuvan International Airport.

4.2.2 Status of Biodiversity

A total of 2,122 species of flora have been recorded in ShNP. The floral richness and diversity of the park is depicted by the presence of 16 endemic flowering plants. Likewise, its faunal richness and diversity is illustrated by the presence of 19 species of mammals including eight threatened ones such as pangolin (*Manis* spp.), leopard cat (*Prionailurus bengalensis*) and clouded leopard (*Pardofelis nebulosa*); 177 species of birds including orange –bellied leaf bird (*Chloropsis hardwichii*); 102 species of butterfly including Kaisser-I-Hind (*Teinopalpus imperalis*); and 129 species of mushroom including *Lactarius pleuritides*. It is the only habitat for relict Himalayan Dragonfly in Nepal. Five types of ecosystems which include Mountain Oak, Collinean oak mixed board leaf forest, *Schima wallichi*, *Castanopsis indica* hygrophytic forest, *Schima wallichi*, *Pinus roxburgii* mesogrophytic forest, *Pinus roxburgii* xerophytic forest provide good habitats.

The land use pattern in and around ShNP is predominated by forest (36.6 percent), followed closely by agriculture (36.2 percent), shrubs (16.1 percent), grassland (4.9 percent), grassland with shrubs (4.0 percent), landslides (0.4 percent), settlements, (0.8 percent), riverine features (0.1 percent) and abandoned lands (0.9 percent).

Threats

The main threats to biodiversity in ShNP as reported by the stakeholders during various discussions are retaliatory killing of wildlife, poaching, garbage accumulation, forest fire, water pollution, road construction, excessive sand and stone quarrying etc. During discussions, some participants also mentioned that the presence of RNA battalion and the RNA Staff College and their training activities as potential threats to wildlife habitat.

4.2.3 Socioeconomic status

In this section, socioeconomic significance of KWR has been assessed based on available secondary information supplemented by characteristic features of households (HHs) drawn from HH survey data. Summary of HH survey information is furnished on **Attachment 4 Table 1** with details in **Annex 7**.

Users

Total population affected by or dependent on the ShNP is 95,837 from 18,235 HHs. Water, fuel wood and fodder are the major products collected from ShNP areas. It is a food shortage area with 25 percent population suffering from food deficiency for 4-10 months each year. Tamangs are the dominant ethnic group comprising almost half of the total population (HMGN, 1996). As a main watershed and source of drinking water for the Kathmandu valley ShNP generates about 30 million litters of water per day tapped from Bagmati, Syalmati, Nagmati, Bishnumati, Sangla, Mahadev and Tusal Khola. Several important religious and cultural sites are located inside the ShNP. About 37,000 foreign and Nepali tourists visited the park in 2002 (DNPWC, 2003).

Demography

Households around ShNP are distributed as large (19 percent), small (72 percent) and landless (10 percent) and as BCN caste (23 percent), ethnic caste (67 percent) and occupational caste (10 percent). Household size averaged around 7.3 persons among the UG member and 5.3 among the NUG member HHs with slightly more females than males and it varied by economic and social groups. A tendency to have larger family among economically and socially better HHs is observed. Irrespective of type, literacy among family members is moderate (almost 57.7 percent) with slightly higher literacy among the males (71 percent in UG member and 55 percent among NUG member HHs) than the females (52 percent in UG and 54.3 percent in NUG member HHs).

Occupation

The survey showed that regardless of type, almost all HHs reported to be involved in service, which was followed by wage. Besides, the study also revealed that agriculture is one of the major occupations of HHs around ShNP. Around 40.4 percent of HHs in UG member category and 34.4 percent in the NUG member category have agriculture as one of the important occupations. Other reported occupation is business and holding job in the service sector.

Livelihood Assets

Land: Land is the primary productive livelihood asset of HHs around ShNP. An average HH belonging to UG group operates around 0.52 ha of land as against 0.13 ha operated by NUG member HHs. The HHs belonging to both occupational caste and BCN group operates 0.3 ha of land whereas those belonging to ethnic caste operated 0.6 ha.

Livestock: Livestock is another important livelihood asset of HHs around ShNP. About 90 percent of both UG and NUG member HHs keep some species of livestock. Although buffalo, cattle, goat, sheep and poultry birds are the important livestock species kept by HHs, most popular livestock reared are sheep, buffalo, cow and goat. Majorities of livestock raised are of local breed. An average UG member HH owns livestock worth Rs 42,643 as against Rs 26,175 worth of livestock kept by NUG member HHs.

Other livelihood assets: Other livelihood assets of HHs around ShNP include their dwelling structures, farm machinery and equipment, means of transport, communication equipment and others. Almost all the HHs have their own house (98 percent in UG member HHs and 100 percent in NUG HHs) worth about Rs 232,157 among UG members and Rs 217,300 among NUG members. Average value of other livelihood assets hold is Rs 92,858 among UG member HHs and Rs 12,788 among NUG member HHs.

Dependency on ShNP

Energy consumption: HHs around ShNP depend heavily upon fuel wood to meet their HH energy requirement. Around 90 percent UG member HH and 90 percent NUG member HH reported using fuel wood as one of the sources of energy. Other sources of energy used are kerosene, electricity, brushwood and LP gas. Next to fuel wood, dependence on kerosene is high (52 percent among UG member HHs and 20 percent among NUG member HH). In meeting the HH fuel wood requirement, HHs depend heavily on NP (46.4 percent) and own source (23.2 percent). Of those using fuel wood, only 7.1 percent of the HHs reported buying fuel wood from the market and the rest resorted to collecting it from different sources.

Forest products: Apart from fuel wood, HH around ShNP also require host of other forest-based products to sustain their livelihoods. These include collection of fodder, timber, litter and grazing of livestock. About 4 percent of UG member HHs resorted to national forest for grazing their livestock, this proportion is only 13 percent in the case of NUG member HHs.

Energy saving devices: HHs around ShNP are also observed using energy saving devices such as RHS, and ICS. Some 22 percent among UG member HHs and 10 percent among NUG member HHs reported using RHS whereas only 2 percent of UG member HHs and none among NUG member HHs reported use of ICS. Overall, user of energy saving device was prevalent in 28 percent of UG member HHs and 20 percent of NUG member HHs.

Capacity enhancement

Since, no BZ has been declared around the park, HH have not benefited much from training opportunities. However, national park itself and few other NGOs have provided few training in the area. Of those receiving training, majority had received training on skill development (15 percent) followed respectively by income generation (10 percent), biodiversity conservation (5 percent). However, majority of the HHs reported to have received other types of training. Sex wise, more of females had received training on skill development, biodiversity conservation and income generating activities while more of males had received training on income generation.

Gender concern

In terms of membership in local organizations, the study showed no specific gender bias. However, the percentage of male involvement in UGs slightly exceeded that of female (100 percent male and 94.4 percent female). In terms of positions held in the local organizations, males exceeded the females. Only about 20.6 percent of female UG members were found holding decision-making positions (Chairperson, Secretary and Treasurer) as against 40 percent of male UG members.

Equity concern

As in KWR, poor people were discriminated in terms of access to UG, decision-making positions, access to training and adoption of program sponsored energy saving devices. In terms of representation in UGs, landless HHs had relatively low representation (8.8 percent) compared to small land holding HHs (71.9 percent) and large land holding HHs (15.8 percent). Likewise, lower proportion of landless HHs were holding decision making positions (5.1 percent), had access to training (2.6 percent) and adopting energy saving devices (20 percent) compared to HHs operating less land (66.7 percent, 69.2 percent and 36.1 percent respectively) and HHs operating more land (23.1 percent, 20.5 percent and 11.1 percent respectively). In terms of social class, no clear discrimination was observed.

Livelihood outcomes

Level of income: HH's livelihood strategies to convert assets into livelihood outcomes resulted into an average annual HH income of Rs 56,207 among the UG member HHs and Rs 35,057 among the NUG member HHs.

Source of income: Majority of UG member HHs reported non-agriculture as the main source of their income. About 71 percent of annual income in UG member HHs and 91 percent among NUG member HHs were derived from non-agricultural sources. Tourism related activities provided lower share of income among both UG member HHs (0.7 percent) and NUG member HHs (0 percent).

4.2.4 Conflicts

As in KWR, increased wildlife population through conservation has created conflicts between park and people. Using the same set of indicators situation of conflict in ShNP was assessed.

People versus ShNP
People around ShNP visit the park for several purposes. Irrespective of whether HHs belonged to UGs or not, majorities of HHs (over 50 percent) reported visiting the park for collection of forest products. Besides, since a road passes through the park linking Kathmandu with the Samundradevi VDC, people have to travel through the park. Therefore, 18.8 percent of the HHs stated their purpose to visit park is for road access. Likewise, many HHs visit the park for religious purposes.

ShNP versus people
About 2 percent of UG member HHs reported incidence of threats to or human causality of their family members from the wild boar, however, none of NUG member HHs reported any human casualty. UG member HHs reported only one incident of human casualty last year.

In a similar manner, some 60 percent of UG member HHs and 80 percent of NUG member HHs reported crop-raiding problems by wildlife last year. This problem is reported as regular phenomenon. The most important crop raider wild animals and birds reported are wild boar, *kalij*, porcupine, bear and monkey. The most commonly raided crops are paddy, maize, potato, millet, and wheat.

Similarly, about 30 percent of both UG member and NUG member HHs reported livestock depredation problems by wildlife. The main predator was the common leopard in all the 16 incidences reported by the survey HH last year, which mostly killed or injured livestock. Livestock killed included goat, ox and cow. Households also reported that they have never been compensated for the damages they suffered from wildlife.

Minimizing wildlife damages
Construction of stone-wall was the method adopted to reduce or control wildlife damages. Although this measure is reported effective, locals did not agree. Above half of the UG member, HHs (52 percent) and nearly one third of NUG member HHs (30 percent) reported their awareness on several measures of mitigating wildlife damage initiated by the management authority. However, almost all expressed their dissatisfaction over the effectiveness of the measures initiated.

Relationships
Significant proportion of UG member HHs (44 percent) and NUG member HHs (40 percent) reported good relationships with the management authorities interpreted in terms of support (training and personal relationship) which they have received. On the other hand, some 20 percent of UG member and 10 percent of NUG member HHs felt that they had nothing to do with management authority and see no relationship.

For failure to properly address the problems of wildlife damage by the park authority, user have virtually stopped approaching them in solving their problem. This is indicated by very high proportion of UG member HHs (88 percent) not approaching park authority to report the problem and also by the dissatisfaction expressed by those approaching the authority for not taking any actions over their complains.

Apart from people and ShNP, several other stakeholders were consulted in the field and their relationship examined. Table 24 presents the perceived relationships between different stakeholders including the basis of relationships.

Table 24: Perceived relationships between different stakeholders -ShNP

Relationships between	Basis of relationship	Present status of relationship
Park Authority and Locals	Firewood, fodder, and litter collection; water for irrigation and drinking, livestock grazing; rights of way and religious activities	Conflict exists for loss of traditional rights and for direct economic loss arising out of wildlife damage of crops and livestock
District/ Village Development Committee and Reserve Authority	Use of park resources for revenue generation and ownership	Lack of coordination and functional linkage in programmes
Reserve Authority and Line Agencies	Use of water by Nepal Water Supply Corporation and coordination and collaboration for programme implementation	Good relationship exits between Park and NWSC but no relationship between Park Authority and other line agencies for lack of meaningful park programme outside its fence

4.2.5 Management

This section summarizes the management approach and modality followed in the management of ShNP. This is then followed by local's recollection of past efforts made to conserve and develop ShNP brought out during village workshops and FGDs.

Programme components, Implementation status and management modality

ShNP forms a major part of Bagmati watershed used for supplying drinking water Kathmandu metropolis. The declaration of this area in 1976 as Watershed Reserve and then to Watershed and Wildlife Reserve in 1984 was strictly for water sources protection managed directly by MoFSC. Shivapuri Watershed Management and Firewood Plantation Project (1985-1992) and Shivapuri Integrated Watershed Development Project (1992-1997) were implemented by HMGN with the FAO's technical support and financial support of Norwegian government. Both the projects had initiated community development work. However, after their phase out, no project is supporting ShNP works initiated earlier. After its declaration of NP in 2002, its management responsibility has been transferred to the DNPWC.

The BZ for the park is yet to be defined and declared. However, several organizations have been conducting their activities in the periphery of ShNP. About 20 CFs in Kathmandu and 10 CFs in Nuwakot have been handed over to the community by the respective DFOs. The DADO and DLSO have been conducting their regular programmes in some pockets by forming UGs. Nepal in Nuwakot through local NGOs have formed female groups. In Kathmandu side, some NGOs through support from other INGO, groups to operate saving/credit programmes. Remarkably, Japanese Alpine Club had established a rhododendron nursery and carried out plantation in ShNP. The DDC Kathmandu is trying to coordinate its activities with that of park. Now, there is no well-defined and clear linkage between programme and activities implemented by LAs and park authority in and around ShNP.

Local recollection of efforts and impacts

Major efforts made in ShNP as recalled by the local stakeholders during field interactions and village workshops and the perceived impacts are summarized in Table 25.

Table 25: Major efforts made and observed impacts - ShNP

Activities (Development and conservation)	Initiated by	Initiated year	Major impact/implication
Preserved as Watershed Forest.	Rana government	Rana Regime	• Water source protected and increased discharge
Initiation of Shivapuri Watershed Development Project	HMGN under Development Board Act 1956	1976	• Improved watershed resources

Activities (Development and conservation)	Initiated by	Initiated year	Major impact/implication
Shivapuri Watershed and Wildlife Reserve (SWWR)	HMGN	1984	• Improved watershed and infrastructure • Increased scarcity of fodder, fuel wood and leaf litter and park-people Conflict
Released few pairs of Russian Wild boar	HMG/N	1985	• Increased crop damage and conflict
Shivapuri Watershed Management and Firewood Plantation Project	FAO/ Norwegian Government	1985–1992	• Increased greenery and locals conservation awareness • Increased opportunities for income generation and conservation farming
Shivapuri Integrated Watershed Development Project (SIWDP)	HMGN/FAO/ Norwegian Government	1992–1997	• Initiation of systematic conservation effort • Community involved in watershed protection and community development • Increased forest resources outside park due to CF.
Bagmati Integrated Watershed Project	HMGN/ MoFSC	1998	• Further improvement of watershed and income opportunities
Afforestation programme	DFO/ NARMSAP	1998	• Improved skill of local people • Increased greenery around the park • More CBO formation
Rhododendron Nursery and Plantation	Japanese Alpine Club	1997-2002	• New technology evolved and increased Rhododendron population
Improvement of water intake in reservoir	NWSC	1998	• Fully stabilization of water reservoir area • Increased water supply to Kathmandu
Shivapuri declared as National Park	HMG/N and MoFSC	2002	• Increased population of wild boar • Increased Park-People conflict
Bippana Barga tatha Mahila Uthan Aayojana	DADO	2004	• Impacts are yet to be seen
Veterinary service centre	HMGN/DLSO		• Improved veterinary services in the area

Capacity assessment of local organizations

The CBOs formed by Shivapuri Watershed Project in the past either are working independently or are disintegrating. A network of CFUGs is effectively working in the influence area of ShNP with strong conservation, saving-credit, and community development activities. In the context of supporting conservation and development in ShNP, these CBOs need reorganization and support.

There are not many NGOs with conservation and development focus around ShNP. Japanese Alpine Club has been involved in establishing Rhododendron nursery and plantation in ShNP. Few others are involved in saving-credit mobilization. All of these are new and immature and require further support. Local social clubs are active in various social development activities in the potential BZ of the park. Kathmandu, Nuwakot and Sindhupalchok DDCs and VDCs around ShNP are involved in utilization of resources such as sand, stone and water in the potential BZ area. They have shown interest ShNP conservation activities, and are willing to coordination their activities with that of park but lack capacity in conservation.

Impacts on Livelihoods

On livelihood impacts, 74 percent of the UG member HHs and 60 percent NUG member HHs had no idea weather the impact was positive or negative. However, 36 percent of UG member HHs and 40 percent of NUG member HHs reported positive impacts

4.2.6 Policy

Almost half of HHs surveyed (50 percent among UG member HHs and 52 percent among NUG member HHs) reported their awareness of policies and legislations related to management of PA or biodiversity conservation, which they knew out of their own initiative. Their knowledge is very limited.

4.2.7 Major problems

Several problems highlighted during discussions with different stakeholders of ShNP are summarized in Table 26.

Table 26: Major problems of ShNP brought out by stakeholders

Biodiversity Conservation	Poverty Reduction
• Poaching and illegal hunting due to ineffective stone wall fence existing • Illegal timber extraction and forest product collection • Scarcity of fuel wood and fodder in the villages • Rapid infrastructure growth along the park boundary (Kathmandu side) • Existence of settlements and Army Staff Collage inside the park • BZ not defined and declared • Use of agricultural chemicals and pesticides • Disturbances to wildlife and their habitat by high anthropogenic factors • Increasing number of visitors and tourists • Low level of public awareness about conservation • No separate park regulations	• Scarcity of fuel wood and fodder warranting illegal collection • Loss of traditional rights and fear of relocation if BZ is declared • Problem of easy access on the public-right-of-way • Problem of not allowing water source maintenance to local people • Crop and livestock damage by wildlife • Poor health facilities in the Nuwakot side • Limited market facilities for fruits and vegetables • Remoteness leading to poor access road, transportation and communication facilities (mainly Nuwakot side) • Illiteracy and low conservation awareness of people • Poor irrigation facility • No visible community development programme of park • No clear demarcation between private land and community forest

4.2.8 SWOT analysis

Strengths, weaknesses, opportunities and threats of ShNP assessed through SWOTs analysis is summarized in Table 27 with details in **Annex 8.**

Table 27: Analysis of strengths, weaknesses, opportunities and threats -ShNP

Strengths	Weakness
• Diverse mid-hills habitat favouring wider biodiversity • Located closest to an international airport and the capital city • Existing CBOs network for watershed conservation • Existence of institutions evolved during implementation of SIWDP • Major source of drinking water of Kathmandu metropolis • Presence of many NTFPs	• Poor economic base of the people and high dependency of people on park forests resources • BZ not yet declared and no donor projects • inadequate infrastructure, logistics and human resource • Tourism potential not adequately harnessed • No concrete programmes on conservation and development • Poor awareness about conservation laws and policies • Weak enforcement of existing legislations • *Dalits*/Poor left out from the mainstream of development activities • Inadequate research on biodiversity conservation and poverty reduction • Poor coordination among different line agencies • Misunderstandings of and confusions about policies and legislations • No separate park regulations

Opportunities	Threats
• High opportunity to develop ecotourism, trekking tourism as well as urban tourism and recreation • Pending declaration of BZ • Good institutional base to launch conservation and poverty reduction programmes • Good market for wildlife farming and licensed hunting of wild boar • Availability of several NTFPs for regulated collection and harvesting • High possibility to replicate SABIHAA modality	• Continued crop raiding, livestock depredation, retaliatory killing of wildlife, poaching, illegal fishing, forest product collection, and public rights of way • Potential forest fire due to accumulation of forest biomes • Trekking tourist and urban tourist have resulted into unmanaged garbage and construction of roads, buildings and excessive sand and stone quarrying • Disintegrating CBOs formed earlier

4.2.9 Potential areas for external interventions

Stakeholders during consultations and village workshops suggested several areas requiring intervention in ShNP for biodiversity conservation and poverty reduction. Suggested areas are summarized in Table 28.

Table 28: Potential areas by stakeholders for external intervention -ShNP

Biodiversity Conservation	Poverty reduction
• Prepare and implement management plan and BZ plan • Establishment of information system regarding flora and fauna • Wildlife habitat management • Strengthening law enforcement • Biophysical and socioeconomic research • Conservation awareness and education • Coordination between the park and local government bodies and line agencies • Systematize access to park resource • Maintain existing stone wall fence and add barbed wire fence on top of it • Allow traditional user rights with due regard to biodiversity • Regulate growth and pollution caused by settlements and *gumbas* inside the parks • Promotion of alternate energy technology • Enforce appropriate physical infrastructure construction code-of-conduct • Allocate specific area for army training • Develop eco-tourism • Framing of park regulations	• Integrate water harvesting with conservation bringing income to the local community • Promote conservation awareness and education • Emphasize soft adventure tourism • Coordinate park activities with those of local government bodies and line agencies • Promote alternative farming system to avoid crop damage by wild boar • Establish nursery for multipurpose plantation • Conduct training on NTFP and other IGAs • Renovate school building and Mahadev temple • Initiate for better health, communication and transportation facilities • Develop irrigation facility and local market for fruit and agro products • Develop suitable mechanism for wildlife farming • Provide compensation against wildlife damage • Develop plan for linking community forestry and IGAs • Develop eco-tourism and picnic spots in CF around ShNP

The intervention areas suggested for ShNP by UG member and NUG member HHs are summarized in Table 29. Majorities of HH from both the UG and NUG group suggested skill development activities (over 36 percent) followed by income generating activities (over 26 percent), infrastructure/community development activities (over 10 percent) and awareness building activities and mitigation of wildlife damage (over 5 percent each). Both users and non-users have given less value to the NTFP promotion and tourism development and to wildlife conservation.

Table 29: Intervention areas suggested by HHs for management of ShNP

	User		Non user		Total	
	No	percent	No	percent	No	percent
Awareness	11	9.2	1	5.3	12	8.7
IGAs	35	29.4	5	26.3	40	29.0
Skill development	44	37.0	7	36.8	51	37.0
Infrastructure/community development	12	10.1	3	15.8	15	10.9
Wildlife damage mitigation	6	5.0	1	5.3	7	5.1
NTFPs/medicinal plant cultivation	2	1.7		-	2	1.4
Wildlife conservation	2	1.7	1	5.3	3	2.2
Saving and credit	4	3.4	1	5.3	5	3.6
Tourism	3	2.5		-	3	2.2
Total	119	100.0	19	100.0	138	100.0

4.3 Langtang National Park

4.3.1 Location

Situated between 28°20'- North latitude and 85°15' – 86°0' East longitudes LNP has an area of 1,710 sq km covering parts of Rasuwa (56 percent), Nuwakot (6 percent) and Sindhupalchok (38 percent) districts. It represents a meeting point between Indo-Malayan and Paleo-arctic realms. The park headquarter is at Dhunche in Rasuwa district. Its topography constitutes areas in the altitude range of 792 m and 7,245 m amsl encompassing areas of mid-hills and alpine region. It encloses watersheds of two major river systems–Trisuli and Sun-koshi. It is located 111 km north from Kathmandu. Gosainkunda situated within the park is a famous pilgrimage site for thousands of Nepalese. In the recent past trekking tourism has developed in the area contributing to the local economy.

Buffer Zone
The BZ was declared in LNP in 1998 to cover 26 VDCs comprising 11 VDCs of Rasuwa, 8 of Nuwakot and 7 of Sindhupalchok district. Six of the 11 VDCs in Rasuwa (namely Ramche, Dhunche, Shyaphru, Bridim, Timure and Langtang) lie inside the park. The BZ is managed by the LNP in partnership with 315 UGs, 21 UCs and a BZMC. The LNP is also a subject of transboundary conservation initiative linking it with the Qomolongma Nature Preserve of Tibet Autonomous Region of China. Initiatives are under way for linking this park with corridors and connectivity with other parks within the country.

Land use
The land use pattern of LNP includes forest (29.87 percent), grassland (4.94 percent), shrub land (2.76 percent), cultivation land (1.70 percent) and others (60.73 percent). Similarly, the land use in BZ includes forest (31.04 percent), cultivated land (28.29 percent), shrub land (25.36 percent), grassland (13.97 percent) and others (1.34 percent).

The significant features of the park are the Langtang and Dorje Himal ranges with the main peaks namely Langtang Lirung (7,245m), Langtang Ri (7,205 m), Lenpo Gang (6,875 m), Dorje Lakpa (6,799 m), and number of glacial lakes like Gosainkunda, 108 *kundas* (lakes), and others.

4.3.2 Status of biodiversity

The diverse geoclimatic setting of LNP has resulted into diverse type of vegetation ranging from Sal forest to Alpine meadows. A total of 3,689 species of flora and 490 species of fauna (mammals 46, birds 345, fish 30, herpetofauna 11, butterfly 58 and spider 10) have been recorded in the site. Fifteen endemic species of flowering plant have been recorded from the park such as *Rhodondendron cownianum, R. lowndesii, Larix nepalensis* (Shrestha and Joshi, 1998). Snow leopard (*Uncia uncia*), Clouded leopard (*Pardofelis nebulosa*), Musk deer (*Moschus chrysogaster*) and Red Panda (*Ailurus fulgens*) are the symbolic species of the park. Nineteen species of mammals found in LNP are protected by CITES. In addition, endemic birds like Spiny babbler and Nepal Wren babbler and some migratory species are also reported to occur. Twelve species of mammals and 2 bird species are endangered and protected under the Appendix I of NPWCA 1973.

Eighteen types of ecosystem have been identified within LNP and these include glaciers, snow, rock, pastures and common land, mesohygrophile rhododendron, mesohygrophytic juniper shrub lands, upper alpine rhododendron, upper sub alpine rhododendron shrub land, lower sub alpine fir forest, lower sub alpine forest etc (BPP, 1995). Various types of NTFPs including medicinal plants and other high value plants are found in this region. Medicinal plants like *jatamansi* (*Nardostychis jatamansi*), chiraito (*Swertia chirata*), *lauth salla* (*Taxus baccata*) and many other commercially valuable plants like *lokta* (*Daphne spp*) are also found in large quantities in LNP.

Threats
There are threats to biodiversity due to both human activities as well as natural phenomenon. As reported by the stakeholders during discussions, the major threats to flora include heavy collection of timber, firewood and fodder, unmanaged extraction of NTFP especially MAPs, excessive grazing, *Goth* (yak shed) keeping, and landslides. They also reported threats to mammals, such as hunting, poaching, *Goth*, road construction, tourism, and cheese factories (e.g. Chandanbari and Kyangjin), Chilime Hydropower project. Other threats reported are hunting, over fishing, and use of toxic agrochemicals by the stakeholders.

4.3.3 Socioeconomic status

In this section, socioeconomic significance of LNP has been assessed based on available secondary information supplemented by characteristic features of HHs drawn from HH survey data. Summary of HH survey information is furnished on **Attachment 4 Table 1** with details baseline situation on **Annex 7.**

Users
There are 54,326 people from 10,509 HHs settled down in and around the park and the BZ (LNP, 2003). Average annual visitors to LNP are 8,510 since 2000 (DNPWC, 2003). The area has been traditionally serving as a major trade route between Nepal and Tibet. The Gosainkunda lake is a famous pilgrimage site for thousands of Nepali visitors annually. The other cultural sites inside LNP are Dhunche Ghyang, Rasuwa Gadhi, Chilime Hot Spring, Getlang Temple, Goljung, Guppa Monastery, Ngonga Chugla Khang Monastery, Samden Nagched Gumba, Tashi Ghyang, Bhairab kunda, Helambu, Tarke Ghyang, Melamchi Ghyang, Thakan Gumba, Betarabati (IUCN, 1997). Large number (above 25000) of pilgrims annually visit religious shrines located in the LNP (LNP, 2003).

Demography
According to field survey, HHs around LNP are distributed as large (36 percent), small (44 percent) and landless (18 percent) and as BCN (36.7 percent), ethnic caste (50 percent) and occupational caste (13.3 percent). Thirty percent of NUG member HHs are landless. HHs around LNP have an average family size of about 5.6 persons among the UG member and 6.2 among the NUG member HHs with more male members than female. HH size however varies by economic class and social groups. A tendency to have larger family among economically and socially better HHs is observed. Irrespective of type, literacy among family members is high (almost 65.2 percent) with slightly higher literacy among the males (77 percent in UG member and 75 percent among NUG member HHs) than the females (52 percent in UG member and 54 percent in NUG member HHs).

Occupation
Agriculture is the major occupation of the area. Thirty-four percent of the HHs depends on agriculture. LNP is a tourist area and significant proportion of HHs (12 percent in UGs and 10 percent in NUGs) are involved on tourism related activities like lodge/restaurant, souvenir shop and nature guide and cultural activities. Apart from these two occupations, some HHs in both the groups are also involved in wage labour (6.4 percent in UG member HHs and 23.3 percent in NUG member HHs in male and 8.5 in UG member HHs and 25.9 percent NUG member HHs in female), small business (12.8 percent in UG and 16.7 percent in NUG member HHs) and service (7.1 percent in UG and 3.3 percent in NUG member HHs).

Livelihood assets
Land: Land is the primary productive livelihood asset of HHs around LNP. An average HH belonging to BZ UG operates around 0.56 ha of land as against 0.18 ha operated by NUG member HHs. Majority of HHs do not have access to irrigation. Obviously average size of operated land varies with economic class of HHs by definition; HHs belonging to occupational caste operate relatively less land (0.1 ha) against 0.4 ha operated by BCN caste and 0.6 ha operated by those belonging to ethnic cast.

Livestock: Livestock is another important livelihood asset of HHs in LNP and BZ. About 75 percent of UG member HHs and 50 percent of NUG member HHs keep some species of livestock. Although buffalo, goat, cow, sheep and poultry birds are the important livestock species kept by HHs, most popular livestock reared are buffalo, followed by goat and cow. Majorities of livestock raised are of local breed. An average UG member HH owns livestock worth Rs 51,348 as against Rs 48,183 worth of livestock kept by NUG member HHs.

Other livelihood assets: Other livelihood assets of HHs include their dwelling structures, farm machinery and equipment, means of transport, communication equipment and others. Almost all the HHs in and around LNP have their own house (98 percent in UG member HHs and 90 percent in NUG member HHs) worth about Rs 2,32,854 among UG member and Rs 1,68,889 among NUG member HHs. Average value of other livelihood assets hold was Rs 22,966 among UG member HHs and Rs 2,170 among NUG member HHs.

Dependency on LNP

Energy consumption: HHs around LNP depend heavily upon fuel wood to meet their HH energy requirement. Around 92 percent UG member HHs and 90 percent NUG member HHs reported using fuel wood as one of the sources of energy. Other sources of energy used are kerosene, electricity and LP gas. Next to fuel wood, dependence on kerosene is high (90 percent among UG member HHs and 80 percent among NUG member HHs). In meeting the HH fuel wood requirement, HHs depend heavily on community forests and LNP. Of those using fuel wood, only 5.7 percent HHs reported buying fuel wood from the market and the rest 95.3 percent reported collecting it from different sources. Some 26 percent HHs collected from National Park, 12 percent from CF, 2 percent from national forests and 8 percent from own sources. On an average, one UG member HH consumed about 8 tons of fuel wood per year (around 200 *Bhari*).

Forest products: Apart from fuel wood, HH around LNP also use host of other forest-based products to sustain their livelihoods. These include fodder, timber, litter, medicinal plants, thatch and grazing of livestock. As against the case of fuel wood, HH dependence on national forests is rather low in meeting their fodder (50 percent UG member HHs and 60 percent NUG member HHs), timber (24 percent UG member HHs and 30 percent NUG member HHs) and litter (20 percent UG member HHs and 40 percent NUG member HHs) requirements. While 9.6 percent of UG member HHs reported using national park for grazing their livestock, this proportion was 15.6 percent in the case of NUG member HHs.

Capacity enhancement

Enhancing the capacity of UG members by providing different types of training is a major component of BZ programme. Among the BZ members 25 people from 50 UG member HHs received different trainings (skill development 10 persons, income generation 8 persons, office management 1 person, bio-diversity conservation one person and entrepreneurship development 4 persons). Altogether 10 male and 15 female received the training. Sex wise, more of females than males have received training in comparison of males.

Gender concern

By virtue of the sample and the way UGs are organized in the BZ, all HHs in the BZ around LNP have participation in community-based organizations. However, gender discrimination in the form of positions occupied in UG/UC and in decision-making role was observed. In most of the UCs, there are male chairpersons and female vice-chairpersons. Decision making position held by ethnic, BCN caste, and occupational caste is 55 percent, 45 percent and 5 percent respectively.

Equity concern

In terms of representation in UGs, landless HHs had relatively low representation (7.7 percent) compared to small land holding HHs (48.7 percent) and large land holding HHs (35.9 percent). Likewise, lower proportion of landless HHs were holding decision making positions (12.5 percent), compared to small land holding and large land holding HHs (40.6 percent each). In a similar manner,

lower proportion of landless HHs were adopting energy saving devices (nil) compared to small land holding HHs (9.1 percent) and large land holding HHs (5.3 percent). As in other PAs, no clear discrimination was observed among different social class of HHs.

Livelihood outcomes
Level of income: HH's livelihood strategies to convert assets into livelihood outcomes resulted into an average annual HH income of Rs 38,830 among the UG member HH and Rs 34,625 among the non-user group HHs.

Sources of income: Majority of UG member HHs reported non-agriculture as the main source of their income. About 48 percent of annual income in UG member HHs and 40 percent among NUG member HHs derived their income from non-agricultural sources. Comparatively, tourism related activities provided BCN share of HH income among NUG member HHs (26 percent) than among UG member HHs (4 percent).

4.3.4 Conflicts

As in KWR and ShNP, increased wildlife population through conservation has created conflicts between park and people. Using the same set of indicators situation of conflict in ShNP was assessed.

People versus LNP
People living in and around LNP visit the national park for several purposes, such as forest products collection (38.4 percent), recreation (20.2 percent), grazing (16.2 percent), religious purposes (11.1 percent), NTFP collection (4 percent), sand and stone collection (4 percent) and meeting with park staff (4 percent). People have good relation with park authority (76.7 percent), average relation (10. percent), poor relation (10 percent) and no relation (3.3 percent).

LNP versus people
A total of 11 cases of wildlife attack on human life including one case of death (by common leopard), 5 cases of major injury (by bear), one case of minor injury (by boar) and 4 cases of minor injury (by snake) were reported last year. No compensation was given to the people by NP authority. In a similar manner, some 82.9 percent of UG member HHs and 17.1 percent of NUG member HHs in and around LNP reported crop-raiding problems by wildlife last year. HHs reporting such incidences, on an average, faced the problem almost two times. The major crop raider wildlife reported are wild boar, monkey, bear and porcupine, and the most commonly raided crops are maize, potato, paddy, wheat, lentils, and vegetables.

Similarly, about 75 percent of UG member HHs and 25 percent of NUG member HHs reported livestock depredation problems by wildlife. The main predator was the common leopard (in 13 incidences) and bear (in 1 incidence). Livestock killed included goat, sheep, cow and buffalo. None of the HHs suffering from wildlife damage reported receiving relief and compensation.

Minimizing the wildlife damage
Construction of physical features such as fences around the cultivated land and noise making are the methods most commonly used to reduce or control wildlife damages. These measures are reported not effective in controlling crop damage. Cultivation of crops unpalatable to wild animals has not been promoted around LNP.

Indulging in park offences seems to be high as 12 percent of UG member and 10 percent of NUG HHs member HHs reported being arrested against some form of offences. Eighty-eight percent UG member HHs and 100 percent NUG member HHs never approached the park authority. While 8 percent of UG member HHs reported occasional reporting, 4 percent reported regular reporting of the problem to park authority. Their reporting however had no effect. Though the BZ had brought the people and park on the joint management framework, most of the people did not see any functional relationships.

Relationship
There exists conflict between DFO and park authority about issuing permits for transportation and trade of forest resources like medicinal plants, wild honey and timber. It has been learnt that the products are illegally collected from the NP and formalized using permits issued by DFO to collect such products from national forests.

Apart from people and LNP, several stakeholders were consulted in the field and their relationship examined. Table 30 presents the perceived relationship between different stakeholders including the basis of relationship.

Table 30: Perceived relationship between different stakeholders -LNP

Relationships between	Basis of relationship	Present status of relationship
The BZMC and locals	Venue organization to reach Park authority	Good and trusty relationship exists
Park Authority and District/ Village Development Committee	Use of park resources for revenue generation and ownership and	In general good except for VDCs complaining for injustice created in delineating BZ by excluding HHs suffering from the Park
Park Authority and Line Agencies	Collaboration and coordination in programme planning and implementation	DDC and DADO have good relation with park authority due to TRPAP and NAF activities
Park Authority and Private Sector	Hotel operation and use of water	Good relationship exists
Park Authority and Conservation Partners	Collaboration in programme implementation	Good relationship exists through supporting each others programmes

4.3.5 Management

This section first summarizes the management approach and modality followed in the management of LNP and then summarizes local's recollection of past efforts made to conserve and develop LNP including the perceived impacts.

Programme components, Implementation status and management modality
The TRPAP is the only one project implemented in the buffer zone of LNP. The programme jointly funded by UNDP, SNV and DFID is executed by MoTCA and the DDC. The major program components of the TRPAP in LNP are focused broadly on development-oriented programs. The program implementation of the TRPAP is in the beginning stage following its support in the implementation of the district planning. The project has a social mobilization and institutional development component by supporting the settlement level UGs formed by the LNP in the buffer zones. Under the human resources development and capacity building component priority has been placed in training on tourism linked with the tourism and environment awareness component. Another important component of the project is sustainable tourism partnership and infrastructure development and refining the villagers' micro and small enterprise skills. The baseline survey and preparation of rural tourism plan of potential settlements by building better coordination are other components of the project.

Few other NGOs are also involved in implementing saving and credit programme, agro-forestry and nursery establishment. UNESCO Kathmandu office has been supporting programmes on cultural heritage conservation, education, gender, HIV/AIDS, skill development training and community development activities through Community Learning Centers with high people participation.

LNP is solely managed by DNPWC following NPWCA 1973 and BZ Regulation 1996. Park programmes are thus implemented as per DNPWC rules and BZ programmes by mobilizing 315 UGs, 21 UCs and 1 BZMC.

Melamchi Drinking Water Development Committee has recently signed Memorandum of Understanding with DNPWC for protection of the natural environment from the negative impacts of the Melamchi Diversion Scheme and influx of workers and camp followers in the overall goal of the BZ component in LNP. The first phase of the Social Upliftment Programme of the Melamchi Drinking Water Development Committee supported by NORAD/WB is supporting LNP activities through programmes like recruitment of BZ team, establishment of Ranger Post, catchment management and tourism plan, environmental awareness, monitoring of contractors, forest protection measures, tourism promotion and establishment of Helambu Cultural Preservation Group in Helambu, Ichok and Kiwul VDCs using BZ UGs.

Functional organizations from three districts have been handed over with CFs since 1993. At present, there are 82 such CFs in the BZ distributed as 57 in Rasuwa, 13 in Sindhupalchok, and 12 in Nuwakot.

Management approach and modality

The park is managed for biodiversity conservation since 1976 under the NPWCA 1973 and is guided by the NPWC Regulation 1974 and the Himalayan National Park Rule 1979, which respects and allows the traditional rights of the indigenous people to use park resources. The BZ of LNP is managed since 1998 as per BZ Management Regulation 1996 and Guidelines 1999 by mobilizing the BZ community. Pending formal hand over of BZ to LNP management, CF and other conservation and development works of other government line agencies are governed by their respective policy and legislations and by LSGA 1999. Different line agencies in around LNP have their own modality to work in the community. However, forming groups seem to be the most prevalent method. After declaration of BZ in 1998, LNP has changed its strict protection modality to community based conservation modality.

Local recollection of past efforts and impacts

LNP is the first mountain national park of Nepal, and its BZ was declared in 1998. Major efforts made in LNP as recalled by the local stakeholders during field interactions and village workshops and the perceived impacts are summarized in Table 25.

Table 31: Efforts made and observed impacts - LNP

Activities (Development and conservation)	Initiated by	Initiated year	Major impact/implication
Forest conservation	DFO	1969	• Not much effective
Establishment of LNP	HMG/N	1976	• Increased greenery due to regulated use of forest products
Firewood collection permitted	LNP on delegation of the local	1984	• Reduced park people conflict to some extent • Annually 25 *bhari* of fuel wood per HH were permitted to collect from LNP
Problem wild boar killing permitted	LNP on delegation of local people to the HM the King	1990	• Reduced damage by wild boar and helped to reduce conflict to some extent
Nigalo/Bamboo collection permitted	LNP	1991	• Improved income opportunities of local dependent people
Community forests hand over by DOFs in BZ		1993 on wards	• Better conservation of biodiversity within LNP • Reduced resource pressure
Initiation of Langtang Eco-tourism Project	TMI in coordination with other NGOs	1996 - 1999	• Increased employment and income opportunities
BZ declaration	Local people and HMGN	1998	• Increased level of participatory conservation and development activities in BZ

Activities (Development and conservation)	Initiated by	Initiated year	Major impact/implication
Management plan drafted out	HMGN and the local stakeholders	2000/01	• Institutional base created for participatory conservation and development
Establishment of Mineral Water Company	Himalayan Mineral Water Company Pvt. Ltd.	2001	• Increase revenue of LNP and threats to wildlife
Provision of hunter cut off	LNP	2002	• Reduced damage by wild boar
TRPAP - Sustainable Rural Tourism Programme	UNDP, MoTCA	2002	• Increased conservation and tourism awareness • Promotion of tourism
Chilime Hydroelectric Project	HMG/N		• Increase revenue of LNP and threats to wildlife
Management of NTFPs and Agroforestry Promotion Project	Nepal Agroforestry foundation with financial assistance of AusAID	2003	• Increased agro-forestry • Reduced pressure in LNP • Enhanced local skill
Social Upliftment Programme	Melamchi Drinking Water Development Committee/NORPLAN	2004	• Deterring potential negative impacts from development activities

Capacity assessment of local organizations

A network of BZMC, BZUCs and BZUGs has been formed in the BZ of LNP. Their level of conservation awareness is still low and requires careful nurturing. Besides, some CFUGs formed by DFO and other CBOs formed by NGOs are operating in the BZ. The user groups formed under the aegis of DSCO are now in a state of being defunct in the absence of legal mechanism.

Various NGOs are involved in conservation education, biodiversity conservation, tourism promotion, and income generation activities. Nepal Agroforestry Foundation, a well-established NGO, has been involved in NTFP research and cultivation activities together with agro forestry component. Besides, the local NGO named Sri Gosainkunda Area Development Committee has been actively involved in keeping the Gosainkunda area clean. Although these NGOs have their own institutional setup and staff, their capacity is limited and operated only when funding support become available.

Rasuwa, Nuwakot and Sindhupalchok DDCs and VDCs adjoining LNP are aware of the conservation and development agenda of LNP but they have not yet linked their programmes with LNP particularly in conservation sector.

Impacts of BZ Programme

Available secondary information and discussion with park authority indicated positive impact of LNP programme on biodiversity conservation reflected by the continued presence and increased population sightings of LNP symbolic species. HH data also supported this. HH reported rare sightings of red panda and other species of LNP[34].

The TRPAP is being implemented in LNP using BZ CBOs with its activities focused on tourism, community development and poverty reduction sector. However, it is too early to assess the impacts on bio diversity conservation and poverty reduction. Similarly, the impacts of Melamchi Project on conservation and development will be realized in a few years time.

[34] Sighting of red panda is rare according to the people. Households surveyed reported sighting of bear (30.8 percent always and 66.7 percent often), wild boar (40.6 percent always and 56.3 often), deer (59.1 percent always and 40.9 percent often), leopard (50 percent always and 46.2 percent often) and monkey (35 percent always and 65 percent often).

Impacts
On livelihood impacts, 80 percent of the UG member HHs and 40 percent NUG member HHs had no idea weather the impact is positive or negative. However, 18 percent of UG member HH and 18 percent of NUG member HH reported positive impacts on livelihood created mostly by LNP and BZ programmes.

4.3.6 Policy

Some 48 percent of UG member and 50 NUG member HHs indicated their awareness of existing conservation policies and legislations. Most of those who reported policy and legislation awareness that their knowledge was due to their own initiatives and very limited.

For other stakeholders, confusion prevailed regarding provisions of LSGA 1999, NPWCA, 1973 and BZ Regulation 1996. Although the BZUCs and the VDCs have common goals of conservation and development, they were found working independently in programme planning and implementation.

4.3.7 Major problems

The major problems highlighted during the discussion and village workshops with different stakeholders of LNP are summarized in the Table 32.

Table 32: Major problems of LNP brought out by stakeholders

Biodiversity Conservation	Poverty Reduction
• Drastically reduced number of *Taxus baccata* and is assumed eliminated. • Excessive collection of *Lokta* and illegal collection of NTFP • Inadequate mechanism of differentiating legal and illegal collection of NTFPs • High and increasing organized poaching including that of endangered species like musk deer • Heavy grazing • Remoteness of the area	• Customary practice of "*Ghewa*" in the Tamangs community • Drastically decreased tourism due to prevailing country's security situation • Lack of coordination among various UGs formed by different organizations • Inadequate training and credit facilities • Increased crop raiding by wild boar, monkey, *kalij* • Insufficient employment opportunity • Low literacy and poor health and sanitation facilities • Low land productivity and fuel wood scarcity • No relief /compensation against wild animal victims • Uncontrolled landslides due to geological process

4.3.8 SWOT analysis

Strengths, weaknesses, opportunities and threats of LNP assessed through SWOTs analysis is summarized in Table 33 with details in **Annex 8.**

4.3.9 Potential areas for external interventions

Stakeholders during consultations and village workshops suggested several areas requiring intervention in LNP for biodiversity conservation and poverty reduction. Suggested areas are summarized in Table 34.

Table 33: Analysis of strengths, weaknesses, opportunities and threats - LNP

Strengths	Weakness
• Involvement of NGOs in conservation • Implementation of BZ management plan being implemented • Excellent habitat for floral and faunal richness and diversity • Fully functional BZ with 315 UGs, 21 UCs, and a BZMC • Availability of many high commercial value NTFPs • Use of park revenue for conservation and development • presence of TRPAP, NAF, Melamchi projects	• Absence of tourism plan • Low level of public awareness • Conflict between communities inside and outside BZ • Continued "*Ghewa*" rituals • *Dalits*/Poor left out from the mainstream of BZ activities • Geological landslides • Inadequate research on biodiversity conservation and poverty reduction • Inadequate training, credit facilities and employment • No compensation against wildlife damage • Management Plan not fully supported by resource provisions and needs revision • No systematic collection of NTFPs • Poor coordination among different line agencies • Rampant poverty including low literacy and low land productivity
Opportunities	**Threats**
• Development of micro hydro electricity • Development of Rasuwagadi-Trisuli road network for promoting trade and tourism with Tibet • Trout Farming • Availability of market to promote domestication of NTFPs and MAPs • Positive outlook of organizations such as NAF and TRPAP • Growing trekking and domestic tourism • Wildlife farming have opened new and alternate occupational opportunities	• *Goth* rotational herding system (transhumance) • Cheese factories in Chandanbari and Kyangjin • Chilime Hydropower project using too much firewood • Continuous natural landslide hazard • Forest fire, soil erosion, trampling effect of the livestock • Human settlement inside the park, development infrastructure, tourism garbage, natural hazards, • Loss of panda habitat due to cheese factory etc • unscientific lopping of some important fodder species • Transmission of diseases from increased disturbances • Unmanaged extraction of NTFP especially MAPs • Wild animal damage of lives, crops and property linked to poaching and revenge killing

Table 34: Potential areas suggested by stakeholders for external intervention - LNP

Biodiversity Conservation	Poverty reduction
• Bring coordination among different stakeholders of LNP and work through same UGs • Conduct community based anti-poaching operations • Develop a system of biodiversity registration in the community surrounding the LNPBZ • Establish a separate monitoring and evaluation unit • Establish a separate tourism unit at LNP Office • Establish fire fighting unit • Establish transboundary cooperation and coordination mechanism with Tibet • Formulate a legal framework to manage the LNPBZ resources by the LNP, BZMC, DDCs, VDCs or the users of the surrounding BZ in accordance with the NPWC Act and BZ Regulations and LSGA • Monitor the symbolic species such as	• Build the capacity of LNP personnel and stakeholders in conservation, tourism and community development through training and higher education • Develop mechanism to wildlife damage and provide relief/compensation • Conduct adult literacy programmes • Conduct training programmes on conservation and development for school teachers, CBO members, • Conduct vocational and trade related training to promote ethnic handicrafts making and tourism related enterprises • Conservation education programmes in schools and in Goth. • Construct infrastructures for park management, tourism and community development (range posts, guard posts, trails, camping sites, view points, shelter house, drinking water, toilet, communication points) • Control landslides on the slopes and *Kharkas* by introducing bioengineering technologies • Develop community development services/facilities (agro processing and storage, veterinary service and medicine, rescue service, ambulance etc)

Biodiversity Conservation	Poverty reduction
snow leopard, red panda, musk deer, Assamese monkey, and endemic birds such as Spiny babbler and Nepal Wren babbler • Prepare and update inventory of the flora and fauna of the area building up on the existing information • Protect the threatened and vulnerable species such as *lauth salla* and *kharsu* • Develop/establish management information system and monitoring of glacial lakes, base camps, trekking routes and other spots • Establish a large-scale biodiversity training, research and documentation center focusing on the mountain perspectives.	• Develop NTFP/MAPs nursery to promote domestication of these products • Implement code of conducts for visitors and tourist related business operation • Introduce farming of wildlife species • Systematize legal extraction of NTFPs by mobilizing MZMC, UCs and UGs • Manage pastures by promoting indigenous techniques of rotational grazing • Prepare a Tourism Management Plan integrating the cultural sites and domestic tourism • Promote alternative energy programme to conserve the forest and lower the demand of fuel wood • Promote cultural heritage preservation linking with nature conservation, such as *Amchi* tradition • Promote traditional skill based enterprises by linking this with market and saving credit programmes

The intervention areas suggested for LNP by UG member and NUG member HHs are summarized in Table 35.

Table 35: Intervention Areas suggested by HH for Management of LNP

	User		Non user		Total	
	No	percent	No	percent	No	percent
Skill development	7	13.7	3	33.3	10	16.7
IGAs	20	39.2	3	33.3	23	38.3
Tourism	9	17.6		-	9	15.0
Saving and credit	3	5.9	1	11.1	4	6.7
NTFPs cultivation and promotion	1	2.0		-	1	1.7
Conservation and management of forest	8	15.7	2	22.2	10	16.7
Conservation education	3	5.9		-	3	5.0
Total	**51**	**100.0**	9	**10.0**	**60**	**100.0**

Majorities of HH from both the UG and NUG group suggested income generating activities (over 33 percent) followed by skill development activities (over 14 percent), tourism (over 17 percent), conservation and management of forest (over 15 percent). Unlike in KWR and ShNP, more HH s suggested conservation-related programmes in LNP.

4.4 Bishazari Tal Ramsar Site

4.4.1 Location

The BTRS is situated between 27° 37'14"N - 27° 36'34" N latitudes and 84° 08'22 E - 84° 25'20" E longitudes towards the northern side and 27° 39'07" N - 27° 37'26" N latitude and 84° 27'07 E- 84° 25'20" E longitudes towards the southern side. It occupies an area of 180 ha water body[35] and 1,000 ha watershed[36] within a natural forest corridor popularly known as the Barandabhar forest between RCNP and the Mahabharat foothills at an altitude of 256m. It is located about 7 km south of E-W highway between Bharatpur and Ratnanagar municipalities in the northern side and two VDCs

[35] The area of water body covered by BTRS is 180 ha as per the BPP 1995, but is only 100 ha according to IUCN inventory in 1998; and is 3,200 ha as mentioned in the Ramsar Information Sheet dated January 2002.

[36] The watershed area of the Bishazari *Tal* is 1,000 ha as recorded in the BPP 1995, whereas the total area could be 70 sq km when the Barandabhar corridor forest (average 20 km north south length) is considered as a whole (personal communication with the KMTNC/BCC officials, January 2004)

namely Gitanagar and Bachhauli in the southern flank. It is connected to E-W highway by several gravel roads and is thus easily accessible. Airport at Bharatpur links BTRS with Kathmandu by air. It lies in the Buffer Zone of RCNP.

4.4.2 Status of biodiversity

Biodiversity significance of BTRS and its surroundings is reflected by the presence of 131 species of flora and 324 species of fauna. The floral diversity and richness is depicted by the presence of 32 tree species, 64 shrub species and 35 aquatic plants species. Likewise, the faunal richness and diversity is illustrated by the presence of 21 species of mammals (9 are large and 12 small type), 17 species of fish, 13 species of reptiles, 37 types of aquatic insects and 273 (22 percent wetlands species) species of birds (IUCN, 1998). Among the mammals, important species include Tiger, Leopard, Rhesus Monkey, Sloth Bear, etc. Some 61 families of birds including critically endangered white rumped vulture, lesser adjutant stork, ferruginous duck, and bank-tailed fish eagle are found in this site. Of the total birds 5 species (4 wetland species) are globally threatened, 9 (6 wetland species) are near-threatened, 23 (14 wetland species, 4 species not included in the list) and 33 species are threatened to extinction. Of the total bird species found, 111 are forest dependent, 149 species are resident species, 24 are summer migrants, 35 of them are breeding species and 84 of them are winter migrants. BPP, 1995 has rated this wetland as very high importance because of its biological diversity and scenic/landscape beauty and high importance in terms of wildlife habitat. It contains excellent habitat for waterfowl and endangered wildlife species including tiger and rhino. Land use pattern in this WS include open forest (30 percent), dense forest (40 percent), grassland (15 percent), and pasture (15 percent).

Threats

The major threats to biodiversity as perceived and observed by the stakeholders included illegal collection of forest products, poaching, over fishing, flood, tourism, increasing population, poisoning, decreasing water level and use of chemical fertilizers and pesticides and so on.

4.4.3 Socioeconomic status

Users

For lack of clear boundary defining the dependent population or its potential users, assessing the socioeconomic situation of people around BTRS is rather difficult and is outside the scope of the present study. However, to have a general feeling of the population around BTRS, two wards of Bharatpur municipality (Wards 8 and 9) and two wards of Ratnanagar Municipality (Wards 6 and 7) and entire wards of Gitanagar and Bachhauli VDCs were considered relevant in focusing limited HH survey planned under the study. In this section, socioeconomic significance of BTRS has been assessed based on available secondary information supplemented by characteristic features of HHs drawn from HH survey data. Summary of HH survey information is furnished in **Attachment 4 Table 2** with details in **Annex 7.**

Irrigation

The main users of the BTRS are the entire population of Chitwan using water from Khageri Irrigation System built in 1959 for irrigation. The system includes 22.7 km long canals with 3,900 ha command area (HR Wallingford, 2001). About 5,000 HHs are involved in irrigation from and around this system and part of the households are directly or indirectly dependent on BTRS in terms of livestock grazing, fodder and firewood collection, fishing and waterfowl trapping[37].

Demography

HHs around BTRS are distributed as large (26 percent), small (66 percent) and landless (8 percent) and as BCN caste (50 percent), ethnic caste (32 percent) and lower caste (18 percent). HHs has an average family size of about 7 persons among the UG member and 6 among the NUG members with

[37] As per IUCN, 1998, 50 HHs are dependent on BTRS for fishing and few for waterfowl trapping.

slightly more females than males. HH size however varies by economic class and social groups. A tendency to have larger family among economically and socially better HHs is observed. Irrespective of type, literacy among family members is high (almost 70 percent) with slightly higher literacy among the males (76 percent in UG member and 74 percent among NUG member HHs) than the females (66 percent in both UG member and non-member HHs).

Occupation

Although not a major occupation, agriculture is one of the occupations of HHs around BTRS. Around 46.5 percent of HHs in UG member category and 38.3 percent in the NUG category have agriculture as one of the important occupations. For the area being very close to RCNP, significant proportion of HHs also depend on tourism related occupations like guide, operating souvenir shops and operation of hotels/restaurants/tea shops, cultural dance, etc. About 33 percent UG member HHs and 32 percent NUG member HHs are engaged in this occupation. Apart from these two occupations, some HHs in both the groups are also involved in small business, fishing, and holding service.

Livelihood assets

Land: Land is the primary productive livelihood asset of HHs around BTRS. An average HH belonging to BZUG operates around 0.66 ha of land as against 0.35 ha operated by NUG HHs. Irrespective of type, majority of HHs have access to irrigation (91 percent in UG member HHs and 87 percent in NUG member HHs). Obviously average size of operated land varies with economic class of HHs by definition, HHs belonging to occupational caste operate relatively less land (0.21 ha) against 0.72 ha operated by BCN caste and 0.83 ha operated by those belonging to ethnic cast.

Livestock: Livestock is another important livelihood asset of HHs around BTRS. About 88 percent of UG member HHs and 80 percent of NUG member HHs keep some species of livestock. Although buffalo, cattle, goat, sheep and poultry birds are the important livestock species kept by HHs, most popular livestock reared are buffalo, followed by cattle and goat. Majorities of livestock raised are of local breed. An average UG member HHs owns livestock worth Rs 10,172 as against Rs 7,378 worth of livestock kept by NUG member HHs.

Other livelihood assets: Other livelihood assets of HHs around BTRS include their dwelling structures, farm machinery and equipment, means of transport, communication equipment and others. Almost all the HHs had their own house (98 percent in UG member HHs and 80 percent in NUG HHs) worth about Rs 283,454 among UG member HHs and Rs 81,278 among NUG member HHs. Average value of other livelihood assets hold was Rs 596,163 among UG member HHs and Rs 44,509 among NUG member HHs.

Dependency on BTRS

Energy consumption: HHs around BTRS depend heavily upon fuel wood to meet their HH energy requirement. Around 86 percent UG member HHs and 90 percent of NUG member HHs reported using fuel wood as one of the sources of energy. Other sources of energy used are kerosene, electricity, LP gas, brushwood, biogas and solar energy. Next to fuel wood, dependence on LP gas is high (42 percent among UG member HHs and 40 percent among NUG member HHs). In meeting the HH fuel wood requirement, HHs depend heavily on community forests and forests around BTRS. Of those using fuel wood, only 5.4 percent of UG member HHs and 7.7 of NUG member HHs reported buying fuel wood from the market and the rest resorted to collecting it from different sources. While majorities of HHs resorted to CF in the BZ and outside in meeting fuel wood requirement, still 9.8 percent of UG member HHs and 15.4 of non UG member HHs reported using national forest (Barandabhar) in meeting part of their fuel wood requirement. On an average, one UG member HH consumed about 2 tons of fuel wood per month (around 50 *Bhari*).

Energy saving device: Promotion of energy saving device is a programme component of BZ. HHs around BTRS were observed using such devices. The energy saving devices promoted under BZ programme mostly included use of ICS, solar cooker, RHS. Use of ICS was found in about 8 percent of UG member HHs and 10 percent of NUG member HHs. While use of SC was used only by 4

percent of UG member HHs, RHS was used by 12 percent of UG and 10 percent of NUG member HHs. Overall, users of energy saving device constituted 24 percent of UG member HHs and 20 percent of NUG member HHs. Low popularity of these devices among HHs around BTRS is their relative cost and easy availability fuel wood.

Forest products: Apart from fuel wood, HHs around BTRS also require host of other forest-based products to sustain their livelihoods. These include collection of fodder, timber, litter and thatching materials and grazing of livestock. As against the case of fuel wood, HH dependence on national forest is rather low in meeting their fodder (4.3 percent), timber (0 percent), litter (0 percent) and thatching material 16.7) requirements. While 13 percent of UG member HH resorted to national forest for grazing their livestock, this proportion was only 9 percent among NUG member HHs.

Capacity enhancement

Enhancing the capacity of UG members by providing different types of training is a major component of BZ programme. All the BZ member HHs covered by the survey reported receiving some training. Of those receiving training, majorities had received training on skill development (25 percent) followed respectively by income generation and office management (17 percent each), enterprise development (10 percent), biodiversity conservation (8 percent), gender and equity (5 percent) and leadership development (3 percent). Sex wise, more of females had received training on skill development and income generating activities while more of males had received training on biodiversity conservation, office management, and enterprise development. This indicated neglecting women in biodiversity conservation activities.

Gender concern

By virtue of the sample and the way UGs are organized in the BZ, all HHs in the BZ around BTRS have participation in local organization without any gender discrimination. However, gender discrimination in the form of position occupied in UG/UC and in decision-making role was observed. In terms of positions held in the local organization, males far exceeded the females. Only about 29 percent of female UG members were found holding decision-making positions (Chairperson and Secretary) as against 96 percent of males. Likewise, only 27 percent of females were involved in making decisions as against 86 percent of males. Although recriminated in terms of positions occupied and decision-making roles, only minority (6 percent) reported discrimination in sharing UG benefits.

Equity concern

In terms of representation in UGs, landless HHs had relatively low representation (6.7 percent) compared to small land holding HHs (67.2 percent) and large land holding HHs (21.8 percent). Likewise, lower proportion of landless HHs were holding decision-making positions (nill), compared to small land holding HHs (76.9 percent) and large land holding HHs (23.1 percent). In a similar manner, lower proportion of landless HHs had participated in training (1.7 percent) compared small land holding HHs (51.7 percent) and large land holding HHs (25 percent each). Surprisingly, more of landless HHs were adopting energy saving devices (75 percent) than small land holding HHs (9.1 percent) and large land holding HHs (30.8 percent). This was because; landless households were involved in tourism related business. In terms of social class, HHs belonging to ethnic and occupational groups were behind BCN groups in almost indicators of access to BZ sponsored activities.

Livelihood outcomes

Level of income: HH's livelihood strategies to convert assets into livelihood outcomes resulted into an average annual HH income of Rs 82,500 among the UG member HH and Rs 10,000 among the non-user group HHs. This big difference in the average annual HH income between UG member and non UG member HH is due to the fact that majorities of non UG member HHs belonged to landless and poor category who have not been able to join the group for lack of cash required to deposit in the UG fund and also because of the loss they incur in attending regular UG meetings.

Sources of income: Majority of UG member HHs reported non-agriculture as the main source of their income. About 77 percent of annual income among in UG member HHs and 79 percent among NUG member HHs was derived from non-agricultural sources. Comparatively, tourism related activities provided higher share of HH income among NUG member HHs (13 percent) than among UG member HHs (1,8 percent).

4.4.4 Conflicts

As in KWR, ShNP and LNP increased wildlife population through conservation in RCNP has created conflicts between park and people. Using the same set of indicators situation of conflict in GTRS was assessed.

People versus BTRS
People around BTRS visit the lake site for several purposes. Irrespective of whether a HH belonged to UG or not, majorities of HHs (over 70 percent) reported visiting the lake for recreation purpose followed by forest product collection and livestock grazing (about 15 percent among UG members). This cordial relation is also supported by low proportion of HHs (8 percent) reporting low incidences of illegal offences and further by reduced level of fishing and bird trapping, and increased level od locals awareness about conservation reported during FGD with a range of stakeholders.

BTRS versus People
About 12 percent of UG member HH and 20 percent of NUG member HH reported incidence of threats to or human causality of their family members from the wildlife around BTRS. Nine such incidences were reported last year of which four incidences were from tiger, two each from rhino and elephant and one from the boar. With these incidences, five persons were killed, three sustained serious injury and one sustained minor injury. This indicates continued conflict between people and conservation effort.

In a similar manner, some 68 percent of UG member HHs and 60 percent of NUG member HHs around BTRS reported crop-raiding problems by wildlife last year. HHs reporting such incidences, on an average, faced the problem almost two times. The most important crop raider wildlife reported are rhino, boar, deer, elephant, peacock, and the most commonly raided crops are paddy, maize, potato, wheat, lentils, mustards and vegetables.

Similarly, about 22 percent of UG member HH and 20 percent of NUG member HHs reported livestock depredation problems by wildlife. The main predator was the tiger in all the 15 incidences reported by the surveyed HHs last year, which mostly killed or injured livestock. Livestock killed included cattle, goat and buffalo. None of HHs who suffered from wildlife damage and reported to RCNP authority reported receiving compensation.

Minimizing wildlife damage
Construction of physical features such as trenches, fences, bio-fences and *machans* are the methods most commonly used to reduce or control wildlife damages. Although these measures are reported effective, locals do not agree. Above half of the UG member HHs (58 percent) and two third of NUG member HHs (70 percent) reported their awareness on several measures of mitigating wildlife damage initiated either by the park management authority or conservation partners. However, almost all the HHs expressed their dissatisfaction over the mitigation measures initiated, as these were ineffective to control the animal movement outside the RCNP. Further BZ programme has a component to promote crops that are not liked by wildlife around the park. However, study teams discussion with park authority and DADO revealed that nothing has been done in this regard.

Relationships
Organizationally, users of BTRS are linked to RCNP through BZMC. Significant proportion of UG member HHs (58 percent) and NUG member HHs (60 percent) reported either good or average relationships with the management authorities interpreted in terms of support (park revenue) which

they have received. On the other hand, some 26 percent of UG member and 20 percent of NUG member HHs felt that they had nothing to do with management authority and saw no relationship. Another observed basis of relationship between the people and management authorities was to report and complain about the wildlife damages and to ask for compensation. Though the BZ had brought the people and park on the joint management framework, most of the people did not see any functional relationships, as those who have actually suffered loss have never been compensated. However, park/buffer zone is compensating for livestock loss, and is providing relief support for human casualties and injuries. For failure to properly address the problems of wildlife damage by the park authority, users have virtually stopped approaching them in solving such problems. This is indicated by very high proportion of UG member HHs (70 percent) not approaching park authority to report the problem and also by the dissatisfaction expressed by those approaching the authority for not taking any actions by the park authority over their complains.

Tourism

Another issue raised by the UGs was that their rights to park resources have been transferred to outsiders who are making money by operating hotels both inside and outside the park. During discussion, questions were raised on the activities of the concessionaires who use park resources such as firewood, grass, water and fodder to operate and maintain lodges, tented camps, elephants and other facilities[38].

Apart from people and RCNP, several other stakeholders were consulted in the field and their relationship examined. Table 36 presents the perceived relationship between different stakeholders including the basis of relationship.

Table 36: Perceived relationship between different stakeholders - BTRS

Relationships between	Basis of relationship	Present status of relationship
The BZMC and locals	Venue organization to reach Park authority	Good and trusty relationship exists
Park Authority and District/ Village Development Committee	Use of park resources for revenue generation and ownership and basis for BZ declaration	In general good except for VDCs complaining for injustice created in delineating BZ by excluding HHs suffering from the Park
Park Authority and Line Agencies	Collaboration and coordination in programme planning and implementation	Good understanding prevails but without any formal linkages in programme planning and implementation
Park Authority and Private Sector	Hotel operation and use of water	Good relationship exists
Park Authority and Conservation Partners	Collaboration in programme implementation	Good relationship exists through supporting each others programmes

4.4.5 Management

This section first summarizes the management approach and modality followed in the management of BTRS and then summarizes local's recollection of past efforts made to conserve and develop BTRS including the perceived impacts.

Programme components, Implementation status and management modality

Three major organizations have been supporting conservation and development of BTRS either directly or indirectly. UNDP has been involved for the last one decade first in the implementation of

[38] As mentioned in the RCNP management plan (2001-2005), there are 7 concessionaires with a capacity of 492 beds with facilities of 221 buildings, 50 vehicles and 60 elephants run by 930 full time staff. The per capita per day tourist expenditure of these concessionaires is US $118. In 1998/99, they handled 38,582 tourists. Similarly, there are 65 lodges operating in the BZ. Under the umbrella of hotel association and on their own capacity, the hotels/lodges have also been supporting for antipoaching operation, grassland management, roads/trails maintenance, and wildlife monitoring and community development on top of their regular contributions in the form of revenue and conservation fees.

PPP and then the PCP. The BZ programmes are the major activities supported under the PCP/PPP. The KMTNC's Biodiversity Conservation Centre has been fully developed as a research and training centre for conservation at Sauraha. The BCC has undertaken a project on RTCP, and has initiated preparation of a Barandabhar corridor forest management plan where BTRS is located. WWF Nepal Programme in association with the TAL Programme is involved BTRS in species conservation through supporting antipoaching operations, rhino translocation and others.

The PCP has program on community mobilization and institutional development including those in two VDCs and two municipalities around BTRS. UGs formed in these areas are tied up with UCs and BZMC. The conservation education has been a major component focused at school students, visitors and the local people. A component for the development and adoption of alternative energy and technology has been initiated such as community forestry and ICS dissemination. A substantial amount of community capital generation and its institutionalization has been accomplished. The financial resources are linked with components green enterprises development and promotion. Another component is the human resource development under which skill enhancement of UG member HHs through training is accomplished.

The TRCP has a number of program components focused mainly on biodiversity conservation involving the larger ecosystem of the whole Barandabhar corridor. Only the wildlife research and monitoring and strengthening anti poaching component of the program is in implementation at the BTRS. Besides, other program components of the TRCP include strengthening management and monitoring of the Barandabhar corridor; establishment of community based conservation model: ecological restoration and management of grassland; community forestry; veterinary; community development; conservation education; promotion of indigenous knowledge; and women participation in natural resource conservation.

Although the BTRS lies in the landscape program area of the TAL but at present, only an anti poaching component has been implemented in the entire RCNP. However, the major program components of TAL includes forest corridor conservation and management; species conservation: research, survey and monitoring; sustainable development; education, communication and capacity building; policy and advocacy; planning and monitoring; and trans boundary activities.

BTRS lies within the BZ of the RCNP and is located in the BZ forest in between two community forests along the Barandabhar Forest corridor and is under the management jurisdiction of RCNP. Except for handing over of 300 metre strips of this forest to community management to safeguard community intrusion in the Tal area and general protection of the Barandabhar buffer zone forests under RCNP jurisdiction, no separate modality for biodiversity conservation and community development has been initiated. However, with declaration of this Tal as a Ramsar Site in September 2003, interest to conserve and manage this wetland site is growing among other local stakeholders.

Locals' recollection of efforts and impacts

The BTRS used to be an ancient *Ghol* of relatively small size in the Barandabhar Forest Corridor, a northern extension of RCNP forest until the government initiated Khageri Irrigation Project in 1959. Now the BTRS is an integral part of the irrigation project. At present, it is an extensive, typical oxbow lake system lying inside BZ of the RCNP providing excellent habitat conditions as a water hole and corridor for endangered wildlife species. Various efforts made after its naming as Bishazari Tal as recalled by different stakeholders during consultations and village workshops are presented in Table 37.

Table 37: Major efforts made and observed impacts - BTRS

Activities (Development and conservation)	Initiated by	Initiated year	Major impact/implication
Establishment of Khageri Irrigation Project	B. P Koirala	1959	• Enlarged lake area and formed regular source of water
DDC stopped its initial system of giving fishing contract from the Tal	DDC	1993	• Reduction in over-extraction of fishes • Increase in the bird sightings
Abandonment entry fee of DDC (Rs 150 per tourist)	Private sectors	1994	• Increased uncontrolled visitors
Declaration of BZ of RCNP	HMG/N	1997	• Community sensitized and organized for conservation and development • A new set of CBOs created
Establishment of Tourism Development Committee with the joint imitative of 10 other institutions	Hotel Association Nepal – Chitwan Chapter	2000	• Increased awareness of locals on BTRS conservation • Local commitment for conservation and development initiated
Hand over of 300 meters of Barandabhar Forest south of E-W highway in the east and west to CF to users	RCNP	2001	• Protection of BTRS as a component of buffer zone forest under RCNP ensured • Additional CBO formed for forest conservation and utilization
Establishment of Bish Hazar Tal Conservation Sub-committee (BTCC)	Tourism Development Committee of DDC	2003	• Stabilize water level • Better habitat for birds
Weed removal	NIFC & BTCC	2003	• Surface area of water increased • Number of birds increased

Capacity assessment of local organization

RCNP has a good institutional set up with a network of BZMC, BZUCs and BZUGs and other CBOs like BZ CF. These institutions are mature enough with minimum capacity developed by the ongoing programmes on both conservation and community development.

NGOs such as Bird Education Society and New International Friendship Club are involved in conservation education, biodiversity conservation, and income generation activities. These NGOs are quite mature, have sufficient staff, have developed networking with conservation and development partners, and are capable to conduct biodiversity conservation and poverty reduction activities.

DDCs/VDCs awareness on conservation issues is high. They have strong poverty reduction programmes. Chitwan DDC, Bharatpur municipality and other local authorities have indicated strong desire to coordinate with management authority in matters related to conservation and development of BTRS.

Impacts of BZ Programme

Available information show increased number of Rhino and Tiger around BTRS which are the key stone species of RCNP and hence the BTRS and of migratory birds. During discussion with the field staff of KMTNC and RCNP, it was revealed that sighting of rhino calves was 11 in 2003. According to them, the rhino population around BTRS is over 30. Tiger sightings have also been increasing in the area. They have confirmed that BTRS along with the Barandabhar forest form a habitat and dispersal corridor as well as seasonal home and movement corridor for a number important carnivores and ungulates (Personal communication with the field staff of RCNP and KMTNC) indicating positive impacts of conservation on biodiversity in and around BTRS. This can also be inferred from

more than 60 percent of HHs reporting regular sightings of tiger and Rhino in and around BTRS and RCNP. Similarly, increased or stable population of main birds of BTRS indicates the positive impact of BZ programme on avian diversity. The total number of birds found in and around the BTRS are 265 as per the checklist prepared by the Bird Education Society in 2004. On livelihood impacts, over half of the UG member HHs and 90 percent NUG member HHs had no idea weather the impact was positive or negative. However, 24 percent of UG member HHs and 10 percent of non-UG member HHs reported positive impacts and 26 percent of UG member HHs reported negative impacts without substantiating these reporting.

4.4.6 Policy

Some 16 percent of UG members HHs were aware of the existing policies and legislations on wetlands. None of the NUG member HHs had however heard about the policies and legislations related to management of wetlands or biodiversity conservation. Even among those who reported policy and legislation awareness, they knew out of their own initiatives and their knowledge was limited to what they can and cannot do.

During discussion with other stakeholders, it was revealed that many were unaware of the Ramsar convention and the National Wetland Policy. They had misunderstandings and confusions on LSGA 1999 and NPWCA 1973 and BZ Regulation 1996. Activities of BZMC and VDCs were not coordinated.

4.4.7 Major problems

Several problems highlighted during discussions and village workshops with different stakeholders of BTRS are summarized in Table 38.

Table 38: Major problems of BTRS brought out by stakeholders

Biodiversity Conservation	Poverty Reduction
• Illegal fishing and turtle killing by poisoning • Growing pollution due to recreational activities • Unclear boundary of the lake • Absence of any significant conservation efforts in the area • Uncontrolled harvesting of seasonal fruits and wild foods • Poor control of water in the lake causing seasonal water fluctuation • Excessive grazing, poor supervision and illegal timber extraction • Reduction in the water surface area due to excessive weed growth	• Prior notification from RCNP and BZMC for undertaking development • Continuous breaking of the dam during heavy rain • Growing pressure on BTRS forest for lack of alternative energy • Unregulated and unplanned tourism • No systematic effort initiated for conservation and development

4.4.8 SWOT analysis

Strengths, weaknesses, opportunities and threats of BTRS assessed through SWOTs analysis is summarized in Table 39 with details in **Annex 8.**

4.4.9 Potential areas for external interventions

Stakeholders during consultations and village workshops suggested several areas requiring intervention in BTRS for biodiversity conservation and poverty reduction. Suggested areas are summarized in Table 40.

Table 39: Analysis of strengths, weaknesses, opportunities and threats - BTRS

Strengths	Weakness
• High biological diversity with good habitat • Ongoing preparation of BZ corridor forest management plan • Ongoing wildlife monitoring • Growing conservation awareness of locals • NTFP cultivation in CF • Rich in ethno-botanical knowledge • Park revenue sharing • Designation of Ramsar Site • Growing multi-stakeholder concern • Rich Tharu Culture • Good network of CBOs and NGOs • Located close to Sauraha of RCNP	• Absence of a comprehensive BTRS management plan • No meaningful efforts initiated for conservation • BZ boundary does not fully cover the dependent committees eg., Gaurigunj • *Dalits*/Poor are not covered by targeted programs • Stakeholders are unaware of Ramsar Site, its obligation, wetland policy • Weak enforcement of the National Wetland Policy 2002 for lack of legal instrument and of NPWCA 1973 and Regulation in the context of BTRS leading to continued illegal fishing, bird killing, illegal NTFP collection • Absence of meaningful system to compensate for wildlife damage • uncoordinated activities of BZUCs and VDCs
Opportunities	**Threats**
• Presence of institutional network for conservation and community development component of system of several lakes • Presence of tourism infrastructure in Sauraha • Located close to Sauraha –alternate tourist spot to minimize pressure in RCNP • Availability of forest product for promotion of community based enterprises • Growing towns in Chitwan provide markets and potential local tourists • Linked to big markets both by road and air • Located in corridor forest of RCNP	• Dependence on Khageri Irrigation System • Multiple claimants on BTRS resources and lack of functional coordination • Use of pesticides and fertilizers • Deforestation in the upstream • Growing urbanization and industrialization • Uncontrolled grazing and disease transmission • Alien species invasion • Fish poisoning • Electrocution • Canal bank erosion during rainy season • Landfill sites • Water harvesting

Table 40: Potential areas suggested by stakeholders for external intervention - BTRS

Biodiversity Conservation	Poverty reduction
• Weed removal from the lake • Promote conservation education • Managed recreation including boating BTRS • Effective management of inlet and outlet system • Develop BTRS as a bird sanctuary • Establishment of bird museum • Promote cycling tourists • Construction of trails and watch towers for bird watching • Hanover management to BZMC • Regulate fishing by mobilizing those most affected	• Conduct adult literacy • IGAs for the poor and DAG group • Improve tourism infrastructure around BTRS • Skill development training related to tourism • Use BTRS to create employment and income opportunities • Initiate relief and compensation against wildlife damage • Developed BTRS be as an alternate tourist centre of RCNP • Use BTRS income for the benefit of the most affected people • Improved irrigation facility

The intervention areas suggested for BTRS by UG member and NUG member HHs are summarized in Table 41.

Table 41: Intervention areas suggested by HH for management of BTRS

Programmes	User		Non user		Total	
	No	percent	No	percent	No	percent
Community/infrastructure development	5	5.9	2	11.1	7	6.9
Sanitation, Health, Hygiene	5	5.9	1	5.6	6	5.9
Tourism promotion	24	28.2	6	33.3	30	29.4
NTFP management	3	3.5		-	3	2.9
Environment protection	2	2.4	1	5.6	3	2.9
Protection	1	1.2	1	5.6	2	2.0
Skill and capacity development	16	18.8	4	22.2	20	19.6
Awareness/Publicity	16	18.8	1	5.6	17	16.7
IGAs	11	12.9	2	11.1	13	12.7
Boundary demarcation/fencing	1	1.2		-	1	1.0
Plantation	1	1.2		-		-
Total	**85**	**100.0**	**18**	**100.0**	**102**	**100.0**

Majorities of HH from both the UG and NUG group suggested tourism promotion (over 28 percent) followed by skill development activities (over 18 percent), income generating activities (over 11 percent), awareness building (over 5 percent). Unlike in LNP, very low proportion of HHs suggested conservation-related programmes.

4.5 Jagadishpur Reservoir Ramsar Site

4.5.1 Location

The JRRS is situated between 27° 35' 00.0" N latitude and 83° 05' 00.0" E longitude. It occupies an area of 157 ha and is the water reserve structure of Banaganga Irrigation Project developed in 1972. The project now irrigates 6,200 ha command area spread in 18 VDCs and 1 municipality in Kapilvastu district. A network of 1 main canal, 16 branch canals, and 160 distribution ditches depend on JRRS for supplying water. The JRRS is located about 10 km south of Motipur (38 km west of Butwal) on the E-W highway. The Lumbini World Heritage Site is about 32 km east of JRRS.

4.5.2 Status of biodiversity

The floral diversity of JRRS is characterized by the presence of 13 species of aquatic flora and other terrestrial vegetation dominated by plantation of Sisoo (*Dalbergia sisoo*) and Khair (*Acacia catechu*) along the dike. The wetland vegetation consists of Morning Glory (*Ipomea carnea* ssp. *fistulosa*), Cattail (*Typha angustifolia*). The aquatic vegetation is represented by extensive coverage of floating leafed species mainly Lotus (*Nelumbo nucifera*) followed by Wild Rice (*Hygrorhiza aristata*) and Pondweed (*Potamogeton nodosus).*Likewise, the faunal richness and diversity is illustrated by the presence of 25 species of fish, 18 species of mammals, 42 species of birds and 8 species of reptiles including occasional sightings of non resident Marsh Mugger during monsoon. Since cultivated land surrounds the wetland, JRRS is not supporting directly wildlife, but still some common species of Jungle Cat, Golden Jackal, and Indian Fox etc are reported around the wetland site. The reservoir at times supports 4percent of the estimated population of regional vulnerable migratory wintering Ferruginous Ducks. Also the resident Indian Sarus Cranes (*Grus antigone antigone*), the regionally endangered and the tallest flying bird species in the world also utilize this habitat. It supports 1percent of the regional population of Lesser Whistling Duck. Apart from this, smaller lakes such as Sagarhawa, Lambu Sagar and Niglihawa situated near the periphery of these lakes serve as a buffer habitat for bird movements. BPP (1995) has rated this wetland as very high importance for its biological diversity and scenic/landscape beauty and high importance in terms of wildlife habitat.

BPP, 1995 has identified 2 types of habitat around the wetland site. Considering the total land area of the Niglihawa VDC (total area 2,654 ha) where the JRRS is situated, the JRRS occupies 157 ha (6

percent), forest 936 ha (35 percent), and the remaining 1,561 ha (59 percent) under agriculture, road, canals etc (Nature, 2001).

Threats
The major threats to JRRS biodiversity as perceived and observed by the stakeholders included uneven depth of water in the reservoir, siltation, accumulation of weeds such as water hyacinth, bird poisoning, illegal fishing, grazing along the dikes, breaching of canals and so on.

4.5.3 Socioeconomic status

To have a general feeling of the population around JRRS, 3 wards of Kapilvastu municipality (Ward 6, 7 and 8) and 2 settlements in Ward 6, Niglihawa VDC were considered relevant in focusing limited HH survey planned under the study. A total of 50 HHs belonging to UGs of the Banganga Water User Association and 10 HHs not included in the UGs were surveyed. In this section, socioeconomic significance of JRRS has been assessed based on available secondary information supplemented by characteristic features of HHs drawn from HH survey data. Summary of HH survey information is furnished in **Attachment 4 Table 2** with details in **Annex 7.**

Users
The main users of the JRRS are the entire population of Banaganga Irrigation System command. The system includes main canal 20.5 km and feeder canal 4.75 km covering the entire command area. There are 51 minor channels after the reservoir and 3 minors before the reservoir directly off taking water from the main canal. The system has 300 km on farm channels that include 100 km of main farm distribution canals and 200 km of farm ditches. About 10,000 HHs are involved in irrigation from this system.

Demography
HHs around JRRS are distributed as large (36 percent), small (44 percent) and landless (20 percent) and as BCN caste (40 percent), ethnic caste (38 percent) and occupational caste (22 percent). HHs around JRRS had an average family size of about 7 persons among the UG member and 8 among the NUG member HHs with slightly more females than males. HH size however varies by economic class and social groups. A tendency to have larger family among economically and socially better HHs is observed. Irrespective of type, literacy among family members is low (almost 49.9 percent) with higher literacy among the males (64.6 percent in UG member and 54.5 percent among NUG member HHs) than the females (35. percent in UG member and 31.6 in non-member HHs).

Occupation
Agriculture is one of the major occupations of all HHs around JRRS. Around 57 percent of HHs in UG member category and 67 percent in the NUG category have agriculture as one of the important occupations. Apart from this occupation, some HH in both the groups are also involved in small business, fishing, wages and service.

Livelihood Assets
Land: Land is the primary productive livelihood asset of HHs around JRRS. An average HH belonging to UG operates around 1.74 ha of land as against 3.34 ha operated by NUG member HH. Average size of operated land varied with economic class of HHs by definition, HHs belonging to ethnic caste operated relatively less land (1.3 ha) against 2.4 ha operated by BCN group and 2.8 ha operated by those belonging to occupational caste.

Livestock: Livestock is another important livelihood asset of HHs around JRRS. About 84 percent of UG member HHs and 80 percent of NUG member HHs keep some species of livestock. Although buffalo, cattle, goat, sheep and poultry birds are the important livestock species kept by HHs, most popular livestock reared around JRRS are buffalo, followed by cattle and goat. Majorities of livestock raised are of local breed. An average UG member HH owned livestock worth Rs6,665 as against Rs7,600 worth of livestock kept by NUG member HHs.

Other livelihood assets: Other livelihood assets of HHs around JRRS include their dwelling structures, farm machinery and equipment, means of transport, communication equipment and others. All the HHs around JRRS had their own house worth Rs232,143 among UG member and Rs241,318 among NUG member HHs. Average value of other livelihood assets hold is Rs309,227 among UG member HHs and Rs122,480 among NUG member HHs.

Dependency on JRRS

Energy consumption: HHs around JRRS depend heavily upon fuel wood to meet their HH energy requirement. Around 76 percent UG member HHs and 100 percent NUG member HHs reported using fuel wood as one of the sources of energy. Other sources of energy used are kerosene, electricity, LP gas, brushwood, bio-gas and solar energy. Next to fuel wood, dependence on kerosene (56 percent among UG member HHs and 60 percent among NUG member HHs) and cow dung cake (58 percent among UG member HHs and 30 percent among NUG member HHs) is high. In meeting the HH fuel wood requirement, they depend heavily on national forests and community forests around JRRS. Of those using firewood, only 12 percent of UG member HHs and 12.5 of NUG member HHs reported buying fuel wood from the market and the rest resorted to collecting it from different sources.

Forest products: Apart from fuel wood, HHs around JRRS also require host of other forest-based products to sustain their livelihoods. These include collection of fodder (10 percent of UG member HHs and none of NUG member HH), timber (2 percent UG member HHs) and thatching materials (18 percent UG member HHs and 20 percent NUG member HHs). National forest is reported as the major source of fuel wood collection for 38 percent of UG member HHs and 25 percent of NUG member HHs. Besides National Forest, HHs also depends on the community forest (24 percent UG HHs and 12 percent NUG member HHs) and wetland (9 percent UG member HHs and 12 percent NUG member HHs). In addition, 12 percent of UG member and 13 percent of NUG member HHs purchased fuel wood. As in the case of fuel wood, HHs dependence on national forest is high in meeting their fodder requirement (50 percent). Similarly, community forest (33 percent) and wetland (17 percent) is another main source of fodder. As far as livestock grazing is concerned, stall feeding (58 percent of UG member HHs and 50 percent of NUG member HHs) was most popular. Besides stall feeding, livestock were grazed in common land (10.6 percent of UG member HHs and 28.6 percent of NUG member HHs) and freely grazed (19.7 percent UG member HHs and 14.3 percent of NUG member HHs).

Energy saving devices: HHs around JRRS were also observed using energy saving device. The energy saving devices promoted included ICS, SC and RHS. Use of ICS, RHS and SC was confined respectively to 2 percent, 4 percent and 2 percent of UG member HHs indicating their poor adaptability. None in NUG group had adopted such devices.

Capacity enhancement

Different organizations had organized several training programmes around JRRS. Of those receiving training, majorities had received training on skill development (16.7 percent) followed respectively by income generation and office management and leadership development (11.7 percent each), enterprise development (8 percent), and gender and equity (3 percent). Sex wise, more of females had received training on skill development, gender and equity while more of males had received training on office management, income generating, enterprise development and leadership.

Gender concern

No visible gender discrimination among UG member HHs existed in JRRS in respect of membership in local organizations. Almost 78 percent of male and 100 percent of female UG member HHs were membership in local organization. However, this was not the case among NUG members where only 22 percent of males and none of females were members. Gender discrimination in the form of position occupied in local organization and in decision-making roles was observed. Only about 45 percent of female UG members were found holding decision-making positions as against 80 percent of males. Likewise, only 50 percent of females were involved in making decisions as against 20 percent of

males of NUG member HHs. Although discriminated in terms of positions occupied and decision-making roles, only minority of HHs (6 percent) reported discrimination in sharing UG benefits.

Equity Concern
In terms of representation in UGs, landless HHs had relatively low representation (16.3 percent) compared to small land holding HHs (25.6 percent) and large land holding HHs (41.9 percent). Likewise, lower proportion of landless HHs were holding decision making positions (11.5 percent), compared to small land holding HHs (23.1 percent) and large land holding HHs (38.5 percent). In a similar manner, lower proportion of landless HHs had participated in training (12.5 percent) compared small land holding HHs (56.3 percent) and large land holding HHs (15.6 percent). The same patter was also observed in respect of adoption of energy saving devices. While none of the landless HH had adopted such device, proportion adopting such devices was 22.7 percent among small land holding HHs and 16.7 percent among large land holding HHs. In terms of social class, HHs belonging to occupational groups were behind ethnic and BCN groups in almost indicators of access.

Livelihood outcome
Level of income: HH's livelihood strategies to convert assets into livelihood outcomes resulted intc an average annual HH income of Rs 60,368 among the UG member HHs and Rs27,000 among the NUG HHs. This big difference in the average annual HH income between UG member and NUG member HHs was because majorities of NUG member HHs belonged to landless and poor category who did not joined the group for lack of cash.

Sources of income: Majority of UG member HHs reported non-agriculture as the main source of their income. About 65.1 percent of annual income in UG member HHs and 56.5 percent among NUG member HHs was derived from non agricultural sources.

4.5.4 Conflicts

As in other PAs and WSs, increased wildlife population in CFs and national forests around JRRS through had created conflicts between park and people. Using the same set of indicators situation of conflict in JRRS was assessed

People versus JRRS
People around JRRS visited the lake site for several purposes. Irrespective of whether a HH belonged to UG or not, majorities (over 55 percent) reported visiting the lake for recreation purpose followed by trespassing and road use (28.3 percent each) and irrigation (3.8 percent)

JRRS versus People
Some 12 percent of UG member HHs and 20 percent of NUG member HHs reported crop-raiding problems by wildlife from CF and national forests around JRRS last year. The most important crop raider wildlife reported was wild boar and deer and the most commonly raided crops are paddy, wheat and pulse.

Relationships
Organizationally, users of JRRS are linked to IDD through WUA. Some 22 percent of UG member HHs and 30 percent of NUG member HHs reported good relationships and 24 percent of UG member HHs and 10 percent of NUG member HHs reported average relationships with the management authorities interpreted in terms of support, which they had received. On the other hand, some 2 percent of UG member and 10 percent of NUG member HHs felt that they had poor relationship with the management authority. Significant proportion of UG member HHs (52 percent) and NUG member HHs (50 percent) reported they had nothing to do with management authority and saw no relationships. Another conflict related issue raised by the UG member HHs was on the distribution of waters for irrigation purpose especially on the winter season. Almost all UG members reported that water regulation in the canal during winter and summer was a problem. They get water when they do not need and do not get water when they need.

Apart from people and JRRS, several stakeholders were consulted in the field and their relationship examined. Table 42 presents the perceived relationship between different stakeholders including the basis of relationship.

Table 42: Perceived relationships between different stakeholders - JRRS

Relationships between	Basis of relationship	Present status of relationship
Wetland Authority (IDD) and Locals / WUA	Use of water resources for irrigation	Good relation exists for irrigation without any efforts made for biodiversity conservation
Wetland Authority and Water Users	Use of water resources for irrigation	Conflict exists for lack of proper management of reservoir and the main canal by the authority and breaching by the users
Water Users' Association and Water Users	Institutional membership and obligations	Conflict exists for lack of transparency of WUA and many water users are not aware of WUA activities and their financial dealings
Wetland Authority (IDD) and District/ Village Development Committee	Use of reservoir related resources for revenue generation and political influence	DDC and VDC sometimes award contract to private parties for gravel and sand collection in Banaganga river around irrigation headwork site. DDC often feels WUA as parallel local government with potential for big political conflict
Wetland Authority and Line Agencies	Collaboration and coordination of programmes	No visible conflict but activities in and around JRRS and irrigation command are not coordinated

4.5.5 Management

Programme components, Implementation status and management modality

Although the JRRS lies in the landscape program area of the TAL but at present not a single component has been implemented. However, the major program components of TAL includes forest corridor conservation and management, species conservation; research, survey and monitoring; sustainable development; education, communication and capacity building; policy and advocacy; planning and monitoring; and trans boundary activities. Except TAL, no specific programmes for the management of this wetland from conservation perspective are on the ground. However, DOI has its own set of programmes for the management of this reservoir from irrigation perspective. No specific modality for conservation management is in place.

The primary authority for JRRS management is the IDD, Western Region 5 located at Taulihawa in Kapilvastu district. Water Users' Association (WUA) and a network of UCs and UGs have been formed for both water distribution and canal management. Both IDD and WUA are concerned more with irrigation and less so with conservation of birds in the reservoir. However, with declaration of this reservoir as the Ramsar Site in September 2003, interest to manage this wetland also from conservation perspective is growing among local stakeholders including IDD and WUA.

Local's recollection of efforts and impacts

JRRS was constructed over the location of a small lake named Jakhira in early 1970s for irrigation purpose. However, with enlarged water surface area, varieties of wintering and staging waterfowls started visiting this reservoir as it provided an excellent habitat for both resident and migratory species. Various efforts made in respect of this reservoir as recalled by different stakeholders during interactions and village workshops are presented in Table 43.

Table 43: Major efforts made and observed impacts - JRRS

Activities	Initiated by	Initiated year	Major impact/implication
Establishment of Raj Kulo	Ranas	Not known	• Economic use of lake water for irrigation
Construction of Banaganga Irrigation System	DOI	1972	• Increased command area and improved irrigation
Command area development Project Relocation of Jagadishpur Village to the west of the reservoir	DOI, financial support by ADB	1979, 1982-89	• Water surface area of reservoir increased providing better habitat • Increased conflict between irrigation authority and displaced locals • Increase in the number of migratory birds
Plantation along the canal bank and reservoir embankment	DOI	After 1983	• improved habitat for wintering and resident birds • Strengthened reservoir embankment
Formation of Banaganga Irrigation System Water Users' Association	DOI	1984	• Increased roles of users in irrigation management • Users organized for better management
Celebration of Niglihawa Fair	Nigali Youth Club, VDC and DDC	1998	• Increased awareness among locals about bird conservation • Reduced killing of migratory birds
Irrigation Management Transfer Programme Initiated	DOI	1999-2003	• Increased roles of users in O and M of the irrigation system
Media campaign for the conservation of Jagadishpur Reservoir	Environmental Activists	2002/03	• Increased conservation awareness • Control in bird killing and rampant fishing
Joint Action by District Administration and RNA for fish and waterfowl conservation	Central District Office	2002	• Bird killing and rampant fishing drastically reduced since 2003
Jagadishpur Reservoir Fish Contract to private contractor	WUA	2003	• Regulated fishing • Deprived local dependent people from their basic livelihood activity
AsDB mission visited Banaganga Irrigation System		2003	• Expected habitat improvement
Preliminary study on upstream-downstream linkage in Banaganga Irrigation system including JRRS	Tarai Arc Landscape (TAL)	2003	• Expected habitat improvement

Capacity assessment of local organization

There are 160 UGs, 16 UCs and 1 WUA under Banaganga Irrigation System. These CBOs are more interested in irrigation and fishery, and are not aware of biodiversity significance of JRRS. Women Development Office, Taulihawa has formed twenty-one women groups and four Women Development Committees around JRRS. Three CFs with their UGs under the DFO are located near the Jagadishpur reservoir. These organizations have their regular conservation and development activities with strong saving-credit component supported by the line agencies.

A number of local NGOs are evolving and are being engaged in conservation awareness and community development activities. Nigali Yuba Club is operating in the area working for the conservation of JRRS by forming UGs and developing management plans. They have their own institutional network and staff, are capable to handle development related activities and have low capacity in areas of biodiversity conservation and require external technical and financial support.

Kapilvastu DDC is well aware and interested in the conservation of the JRRS. The DDC initiated *Niglihawa Mahotsav* in 1998. Similarly, VDCs around JRRS are interested in the conservation and development of the area but lack technical capacity and financial resources.

Impacts on Livelihoods

On livelihood impacts of different programmes conducted around JRRS, over half of the UG member and 40 percent NUG member HHs reported positive impacts. Similarly, 48 percent of UG member and 40 percent of NUG member HHs could not express their idea weather the impact was positive or negative. Surprisingly, none of the respondents reported negative impacts. These revealed impacts are from irrigation.

4.5.6 Policy

Some 16 percent of UG member HHs reported their awareness of existing policies and legislations on wetlands whereas 10 percent of the NUG HHs reported hearing of such policies. But their knowledge was very limited.

4.5.7 Major problems

Several problems highlighted by different stakeholders of JRRS during discussions and village workshops are summarized in Table 44.

Table 44: Major problems of JRRS brought out by stakeholders

Biodiversity Conservation	Poverty Reduction
• Not clear demarcation of JRRS • Excessive growth of *Ipomea species* in and around the reservoir • Illegal fishing and turtle killing • Not yet managed as Ramsar Site • Multiple claimants for the Reservoir. • Lacking periodic limnological research • Killing of waterfowls by poison • More emphasis on irrigation and none to conservation. • No research on migratory birds • Low awareness of persons and organizations about their rights, roles and responsibilities • Siltation from feeder canal.	• Breaching of canals at numerous places • Elite dominance on benefit sharing • Families displaced from subsistence fishing • Illiteracy and inadequate employment opportunities • Insufficient programmes addressing the needs of the poor, disadvantaged and special target groups. • Insufficient training on skill development. • Irregular and untimely water discharge from the reservoir and the canals. • Poor hygienic conditions in the villages. • UGs of agriculture and WUS are working independently • Underdeveloped tourism • Conflict between UGs, UCs and WUA over transparency issue

4.5.8 SWOT analysis

Strengths, weaknesses, opportunities and threats of JRRS assessed through SWOTs analysis is summarized in Table 45 with details in **Annex 8.**

Table 45: Analysis of strengths, weaknesses, opportunities and threats - JRRS

Strengths	Weakness
• High biological diversity • Planned desiltation of the JRRS • Existence of a network of CBOs with permanent source of income • Existence of active NGOs • VDC keen to conserve JRRS • Conservation not yet integrated with irrigation	• Low awareness of locals about conservation including policies and legislations • Conflict between CBOs • *Dalits*/Poor left out from the mainstream of development activities due to weak enforcement • Weak enforcement of Wetland Policy. • Inadequate conservation and tourism infrastructures

• Increasing conservation awareness among local people and organizations • Increasing conservation concerns of conservation organizations like WWF and IUCN	• Poor coordination among concerned LAs • Insufficient forest habitat • Lack of management plan • Weak enforcement of existing legislations because of which illegal activities is prevalent
Opportunities	**Threats**
• Declared as Ramsar Site • Regulatory fishing • Upcoming conservation organization at local level • Emerging concept of bird sanctuary • Availability of raw materials for Local handicrafts • Located in Lumbini-Tilaurakot corridor of the archaeological tourism • Opportunity for local recreation	• Conflicts of interests between WUA and WUC and with the DDC/VDC • Uneven depth of reservoir • Grazing in the embankment • Heavy growth of weeds • Poisoning of birds and illegal fishing • Siltation • Use of reservoir dikes for transport and thoroughfare

4.5.9 Potential areas for external interventions

Stakeholders during consultations and village workshops suggested several areas requiring intervention in JRRS for biodiversity conservation and poverty reduction. Suggested areas are summarized in Table 46.

Table 46: Potential areas suggested by stakeholders for external intervention - JRRS

Biodiversity Conservation	Poverty reduction
• Define the Ramsar site boundary by including areas such as the existing community forests and the archaeological sites • Remove weeds • Provide conservation education and build local awareness • Manage inlet and outlet system effectively • Formation of multi-stakeholders' committee to take responsibility of the wetland • Anti-poaching campaigning for conservation of migratory birds • Canal bank plantation • Controlled fishing • Manage upstream watershed to protect the reservoir and the canal system • Improve habitat by levelling the reservoir	• Integration with the Lumbini-Tilaurakot heritage tourism corridor • Increase adult literacy • Promote IGAs • Improve tourism infrastructures • Promotion of tourism related business through training • Improve irrigation efficiency through proper maintenance of canal system. • Strengthen the WUA in according with the spirit of the water acts. • Mobilization of the downstream water users' community towards contribution for the preservation of the reservoir

The intervention areas suggested for JRRS by UG member and NUG member HHs for its conservation and continued use for irrigation are summarized in Table 47.

Majorities of HH from both the UG and NUG group suggested livelihood improvement activities like employment generation and IGA promotion, efficient management of irrigation system, community development and tourism promotion (over 60 percent of UG member HHs and over 42 percent of NUG member HHs). Some 14.6 percent of UG member HHs and 21.4 percent NUG member HHs suggested for better management of JRRS from wetland conservation perspective. Almost equal proportion of HHs (over 6 percent) suggested bird conservation and over 8 percent suggested cleaning JRRS.

Table 47: Intervention areas suggested by HH for management of JRRS

Programmes	User		Non user		Total	
	No	percent	No	percent	No	percent
Enhance water capacity storage	2	2.1	1	7.1	3	2.7
Local employment generation/IGAs	16	16.7	2	14.3	18	16.4
Management of irrigation system	11	11.5	2	14.3	13	11.8
Effective management and conservation of wetland	14	14.6	3	21.4	17	15.5
Skill/capacity enhancement	7	7.3	1	7.1	8	7.3
Infrastructure/community development	10	10.4	1	7.1	11	10.0
Management plan and policy for conservation development	2	2.1	4	-	2	1.8
Tourism development	20	20.8	1	7.1	11	10.0
Preservation of conservation birds	6	6.3	1	7.1	7	6.4
Sanitation and cleaning of lake	8	8.3	2	14.3	10	9.1
Total	**96**	**100.0**	**14**	**100.0**	**110**	**100.0**

4.6 Ghodaghodi Tal Ramsar Site

4.6.1 Location

The GTRS is situated between 28° 41'03"N - 28° 41'05" N latitudes and 80° 56'43E - 80° 56'50" E longitudes. It occupies water surface area of 138 ha with 250 ha watershed area. GTRS is touched by three VDCs, namely RamshikharJhala, Darakhnidhi and Sandepani. Its boundary runs along the Churia hills in the north, Kauwa khola and Simtari village in the west, Darakh-Pahalmanpur section of the E-W highway in the south and Doda river in the east. In September 2003, the GTRS was recognized as an international Ramsar Site under the Ramsar Convention on Wetlands of International Importance for its significance of migratory birds especially the waterfowls and endangered wildlife species. A view tower has been constructed at a centrally located landmark in the Ghodaghodi lake. There is a short trail beside the lake.

GTRS forms a forest corridor of Churia and foothills linking with the RBNP and RSWR. It is connected with the Dudhwa National Park in India via the Basanta forests forming a north-south ecological corridor in the Kailali district. This is further strengthened by the implementation of TAL programme in the district with WWF support. Due to its strategic location between RBNP and RSWR it provides tremendous opportunities for developing ecotourism in the area. Since GTRS is close to E-W highway, it is easily accessible to outsiders throughout the year.

4.6.2 Status of biodiversity

Biodiversity of GTRS is diverse with a recorded 244 species of flora and 191 species of fauna (IUCN 1998). Its floral richness and diversity is depicted by the presence of 43 tree species, 77 herb species, 107 aquatic plant species, and its faunal richness and diversity is illustrated by the presence of 34 species of mammals, 17 species fish, and 140 species of birds. The area is a cluster of nine lakes, which are located in rectangular area of 5.5 km x 1.5 km. GTRS was originally enclosed by dense forest until the construction of E-W highway; it is under severe threat due to growing population pressure.

Globally threatened species found in the GTRS include Ferruginous Duck, Grey -headed Fish Eagle Red-crowned Roofed Turtle (critically endangered), Three-striped Roof Turtle (endangered), Smooth-coated Otter, Common Otter, Lesser Adjutant Stork, Marsh Crocodile (vulnerable), and Ferruginous Duck, Asiatic Rock Python (least risk). Three species of turtles and

17 species of fishes are recorded in GTRS including such species like *Tor tor*, which normally found in fast flowing streams. The resident population of Pigmy Goose (*Nettapus coromandelianus*) in GTRS is about 1 percent of total Asian population (IUCN 1998)

The endangered reptile species reported in the area include golden monitor lizard and Indian python, and three species of turtle has been (BPP, 1995). This area also houses indigenous species of fish. Among the other mammals, species include common leopard, rhesus monkey, sloth bear, common otter and wild boar. Of the total bird species found, 4 are resident bird (Baral, 1992), and few birds, which breeds in North Asia are also reported to occur here. A total of 32 butterfly species have been reported from this area. BPP, 1995 has rated this wetland as very high importance because of its biological diversity and scenic/landscape beauty and high importance in terms of wildlife habitat.

Land use pattern in this WS includes 98 percent dense forest and 2 percent pastureland. Its watershed constitutes 70 percent open forests and 30 percent grassland and pasture. The three VDCs around the GTRS occupy 275 sq km area of which 60 percent is under agriculture, 36 percent under forests, and 3 percent under roads and rivers.

Threats

The major threats to biodiversity as perceived and observed by different stakeholders consulted included illegal collection of forest products, poaching, over fishing, poisoning, decreasing water level and use of chemical fertilizers and pesticides around GTRS.

4.6.3 Socioeconomic status

About 44,393 people from about 6,195 HHs around the lakes use this area to collect forest products including aquatic plants, wild foods, medicinal plants and fishes (DFO Kailali, 2000). The lakes and its surroundings have great religious and cultural values. Twenty-seven villages around GTRS celebrate annual festival in the area on rotational basis.

Users

To have a general feeling of the population around GTRS, two wards of Ramshikharjala VDC (Ward 8 and 9) one wards of Darakhnidhi VDC (Ward No-6) and one ward of Sandepani VDC (Ward No-7) were considered relevant in focusing limited HH survey planned under the study. A total of 50 HHs belonging to UGs and 10 HHs not included in the UGs were surveyed. In this section, socioeconomic significance of GTRS has been assessed based on available secondary information supplemented by characteristic features of HHs drawn from HH survey data. Summary of HH survey information is furnished in **Attachment 4 Table 2** with details in **Annex 7.**

Demography

HHs around GTRS are distributed as large (22 percent), small (44 percent) and landless (34 percent) and as BCN caste (53.4 percent), ethnic caste (33.3 percent) and occupational caste (13.3 percent). HHs around GTRS have an average family size of about 7.1 persons among the UG members and 5.9 among the NUG member HHs with slightly more females than males. HH size however varies by economic class and social groups. A tendency to have larger family among economically and socially better HHs is observed. Irrespective of type, literacy among family members is low (almost 35 percent) with slightly higher literacy among the females (35.9 percent in UG member and 50 percent among NUG member HHs) than the males (36 percent in UG member and 31.6 percent in NUG member HHs).

Occupation

Agriculture is one of the major occupations of HHs around GTRS. Around 50.7 percent of HHs in UG member category and 62.4 percent in the NUG category have agriculture as one of the important occupation. About 9.5 percent UG member HHs and 2 percent NUG member HHs are engaged as wage labour. Apart from these two occupations, some HHs in both the groups are also involved in operating small business, fishing and in the service sector.

Livelihood Assets

Land: Land is the primary productive livelihood asset of HHs around GTRS. An average HH belonging to UG operated around 1.1 ha of land as against 0.36 ha operated by NUG member HHs. Irrespective of type, majority of HHs had access to irrigation (79 percent in UG member HHs and percent in NUG member HHs). Average size of operated land varied with economic class of HHs by definition. HHs belonging to occupational caste operated relatively less land (0.5 ha), followed by BCN caste (0.7 ha) and 1.4 ha operated by those belonging to ethnic cast.

Livestock: Livestock is another important livelihood asset of HHs around GTRS. About 86 percent of UG member HHs and 100 percent of NUG member HHs keep some species of livestock. Although buffalo, cattle, goat, sheep and poultry birds are the important livestock species kept by HHs, most popular livestock reared are buffalo, followed by cattle and goat. Majorities of livestock raised are of local breed. An average UG member HH owned livestock worth Rs 7, 134 as against Rs 4,663 worth of livestock kept by NUG member HHs.

Other livelihood asset: Other livelihood asset of HHs around GTRS includes their dwelling structures, farm machinery and equipment, means of transport, communication equipment and others. Almost all the HHs around GTRS had their own house (98 percent in UG member HHs and 100 percent in NUG member HHs) worth about Rs 34,539 among UG member HHs, and Rs 20,636 among NUG member HHs. Average value of other livelihood assets holding is Rs 421,662 among UG member HHs and Rs 14,118 among NUG member HHs.

Dependency on GTRS

Energy consumption: HHs around GTRS depend heavily upon fuel wood to meet their HH energy requirement. Around 82 percent of UG member HHs and 90 percent NUG member HHs reported using fuel wood as one of the sources of energy. Other sources of energy used are kerosene, electricity, brushwood, and cow dung. Next to fuel wood, dependence on kerosene is high (80 percent in both the groups). In meeting the HH fuel wood requirement, HHs depend heavily on community forests (81.8 percent) and forests around GTRS (10 percent among UG member HHs and 30 percent among NUG member HHs). Of those using firewood, only 1.5 percent of UG member and none among NUG member HHs reported buying fuel wood from the market and the rest reported collecting it from different sources.

Forest product: Apart from fuel wood, HHs also depend on other forest-based product to sustain livelihood. These include collection of fodder, timber, litter and thatching materials and grazing of livestock. As against the case of fuel wood, HH dependence on national forest is rather low in meeting their fodder (32 percent), litter (2 percent) and thatching material (18 percent) requirements. While 4.2 percent of UG member HHs resorted to national forest for grazing their livestock, this proportion was only 4.9 percent in the case of NUG member HHs.

Energy saving device: As alternative energy saving technology RHS was the only technology used by 2 percent each of UG and NUG member HHs. Low popularity of these devices among HHs around GTRS was their relative cost and easy availability fuel wood.

Capacity enhancement

Enhancing the capacity of UG members by providing different types of training is a major component of CF programme. The entire UG member HHs covered by the survey reported receiving some training. Of those receiving training, majorities had received training on skill development (25 percent) followed respectively by income generation and office management (16 percent each), enterprise development (10 percent), biodiversity conservation (10 percent), and leadership development (7.7 percent). Sex wise, more of females had received training on skill development and income generating activities while more of males had received training on conservation, office management, and enterprise development. It clearly indicated neglecting women role in biodiversity conservation.

Gender concern
By virtue of the sample and the way UGs are organized in the CF, all HHs in the UGs around GTRS have participated in local organization without any gender discrimination. However, gender discrimination in the form of position occupied in UGs and in decision-making role was observed. In terms of positions held in the local organization, males far exceeded the females. Only about 23 percent of female UG members were found holding decision-making positions (Chairperson and Secretary) as against 92 percent of males. Likewise, only 23 percent of females were involved in making decisions as against 84 percent of males.

Equity Concern
In terms of representation in UGs, landless HHs had relatively low representation (8.3 percent) compared to small land holding HHs (45 percent) and large land holding HHs (46.7 percent). Likewise, lower proportion of landless HHs were holding decision making positions (16.1 percent), compared to small land holding HHs (54.8 percent) and large land holding HHs (29 percent). In a similar manner, lower proportion of landless HHs had participated in training (9.1 percent) compared small land holding HHs (56.8 percent) and large land holding HHs (18.2 percent). In terms of social class, HHs belonging to occupational groups were behind ethnic and BCN groups in almost indicators of access.

Livelihood outcome
Level of income: HH's livelihood strategies to convert assets into livelihood outcomes resulted into an average annual HH income of Rs 16,905 among the UG member HH and Rs 20,687 among the UUG member HHs.

Sources of income: Majority of UG member HHs reported non-agriculture (64.3 percent) as the main source of their income where as majority of NUG member HHs income (66.2 percent) was derived from agricultural sources.

4.6.4 Conflicts

Religious encroachment by the Ghodaghodi temple, crop damage by wildlife, and lack of compensation against wildlife damages provided grounds for conflict. After declaration of Ramsar Site, several stakeholders have started showing interest on GTRS, which also created conflict regarding jurisdiction. The evacuation of a settlement in the government forest near the GTRS by the DFO also created conflict.

People vs GTRS
People around GTRS visit the lake site for several purposes. Irrespective of whether HHs belonged to UGs or not, majorities of HHs (over 66 percent) reported visiting the lake for recreation purpose followed by forest product collection (over 32 percent), religious purpose (54 percent) and livestock grazing (about 4 percent among UG member HHs).

GTRS vs people
Some 66 percent of UG member HHs and 70 percent of NUG member HHs around GTRS reported crop-raiding problems by wildlife last year. HHs reporting such incidences, on an average, faced the problem almost two times. The most important crop raider wildlife reported are boar, deer, jackal and the most commonly raided crops were paddy, maize, potato and vegetables.

Minimizing wildlife damages
UG member HHs (32 percent) and half of NUG member HHs (50 percent) reported their awareness on several measures of mitigating wildlife damage initiated either by the management authority or conservation partners. However, majority reported these measures not effective in controlling wildlife movement outside the forest.

Relationships
Significant proportion of UG member HHs (72 percent) and NUG member HHs (66 percent) reported either good or average relationships with the management authorities interpreted in terms of support, which they have received. On the other hand, some 26 percent of UG member and 20 percent of NUG member HHs felt that they had nothing to do with management authority and saw no relationships.

Apart from people, several stakeholders were consulted in the field and their relationship examined. Table 48 presents the perceived relationships between different stakeholders including the basis of relationships.

Table 48: Perceived relationship between different stakeholders - GTRS

Relationships between	Basis of relationship	Present status of relationship
The WS authority and locals	Settlement evacuation *Tal* area	Strained relationship exists
WS authority and District/ Village Development Committee	Definition of roles on conservation	Good relation with DDC but not so good with VDC
WS authority and Line Agencies	Programme coordination and collaboration	Almost no relation
WS authority and Private Sector	Conservation of GTRS (KCCI)	Good relationship exists
WS authority and local NGO	Working jointly for conservation	Good relationship exists
WS authority and CBOs	Programme run according to guideline	Good relationship

4.6.5 Management

Programme components, Implementation status and management modality

Although the GTRS lies in the landscape program area of the TAL but at present not a single component has been implemented. Management of GTRS falls under the jurisdiction of DFO Kailali. Except for fencing some area, removing encroachment in the forests near GTRS and assigning one guard, DFO has not been active in the conservation of GTRS. While DDC has used GTRS for small-scale irrigation purpose, DFID has been planning to erect stone-wall around GTRS to raise water level and use GTRS for irrigation purpose.

Ongoing Projects and Conservation Partners
Only one NGO Ghodaghodi Area Conservation and Awareness Forum is presently working for conservation GTRS. IUCN funded this NGO to prepare inventory of lake in 2002. Likewise, IUCN-Netherlands supported preparation Management Plan. Presently there is not any project and donor agency working for the conservation of GTRS.

Management approach and modality
The DFO of Kailali is the management authority of the area but is almost non-functional in this area due to security reason. The area office of the DFO is about 2 km west of GTRS along the highway. Several CFUGs are functional around GTRS following HMG/N Forest Act and Regulation.

Local recollection of efforts and impacts
Realizing the importance of conservation of GTRS, a Ghodaghodi Area Conservation and Awareness Forum was formed in 1994 under the chair of Bir Bahadur Hamal. This forum became inactive after 2 years. Then a new Ghodaghodi Conservation Committee was registered in Social Welfare Council in 1998. This committee has so far conducted baseline study and limnological research; and prepared action plan, wetland inventory and management plan. Various efforts made in respect of GTRS conservation as recalled by several stakeholders during consultations and village workshops are summarized in Table 49.

Table 49: Major efforts made and observed impacts - GTRS

Efforts made	Initiated by	Initiated year	Major impact/implication
Koti Hom Yagya	Yogi Narahari Nath	1993	• Initiation of religious encroachment
Completion of *Karnali* Bridge		1993	• Increased access to GTRS • Increased eco-tourism prospects
Establishment of *Ghodaghodi Samraksan Manch*	*Ilaka* member of DDC	1994	• Created informed basis for planning • Increased awareness of local stakeholders
Wetland Survey	DNPWC/BPP	1995	• Informed basis created • Limited technical and socioeconomic significance explored
Formation of multi-stakeholders conservation committee	DDC	1996	• Increased awareness of local stakeholders about conservation • Expressed commitments by stakeholders
Wetland Survey	IUCN	1996-1998	• Informed basis created • Limited technical and socioeconomic significance explored
Partial fencing and plantation of 60,000 plants of NTFPs	DDC/DFO and GSM	1998	• Decreased encroachment and illegal fishing and poaching • Increased economic significance of the area
Establishment of Tharu Culture Centre	GSM	2002	• Added a new dimension of eco-tourism • Integration of biodiversity conservation with cultural heritage
Preparation of Management Plan	IUCN Netherlands	2002	• Initiation of systematic effort towards conservation
Displacement of squatters	DFO	2002/03	• Better environment for conservation created
Enlisted as Ramsar Site	HMG/N	2003	• Increased government's commitment towards GTRS conservation
A Brief Concept of Project on Management of Wetland	KCCI	2003	• Reflection of private sector initiative for GTRS conservation and eco-tourism development

Capacity assessment of local organization

Including one CFUG formed by the DFO, there are 12 CFUGs are functional in the area. Recently, a local forum called *Ghodaghodi Kshetra Samrakshan Tatha Bikas Samiti* (GKSTBS) along with five eco clubs and 14 UGs have been formed for the conservation of GTRS and are involved in the implementation of various conservation and development activities. These CBOs are energetic; however, need further support. The GKSTBS has been now established as a local NGO. The Kailali Chambers of Commerce and Industries took initiative to form the GKSTBS. The GKSTBS with the financial and technical support of IUCN prepared a separate GTRS management plan. These NGOs are dedicated to the GTRS, however, need technical backstopping.

Kailali DDC is aware and more concerned with the conservation of GTRS. DDC has allocated Rs 400,000 budget for the development of GTRS. DDC also constructed fence in the Tal area. VDCs around GTRS are also concerned with conservation activities. DDC accepts that it has no technical and financial capacity to manage GTRS and feels that its role should be limited only to coordination for which it is ready and capable.

Impacts on Livelihoods

On livelihood impacts, over half of HHs (60 percent UG member and 72 percent NUG member HHs) had no idea weather the impact was positive or negative. However, 28 percent of UG member HHs

and 40 percent of NUG member HHs reported positive impacts and 24 percent of UG member HHs reported negative impacts without substantiating these reporting.

4.6.6 Policy

Some 16 percent of UG member HHs was aware of the existing policies and legislations on wetlands. But their knowledge was very limited.

4.6.7 Major problems

Several problems highlighted by different stakeholders of GTRS during discussions and village workshops are summarized in Table 50.

Table 50: Major problems of GTRS brought out by stakeholders

Biodiversity Conservation	Poverty Reduction
• Absence of any significant conservation efforts in the area • Boundary of the lake not yet clearly established • Decreasing water level and weed growth • Excessive grazing and timber extraction • Fish and bird poisoning • Pollution due to increasing religious activities	• Absence of government authority and programme • Crop raiding by wild boar and of compensation against wildlife damage • Insecurity in the area • Inadequate training programme • Low literacy rate • Rapid population growth

4.6.8 SWOT analysis

Strengths, weaknesses, opportunities and threats of GTRS assessed through SWOTs analysis is summarized in Table 51 with details in **Annex 8.**

Table 51: Analysis of strengths, weaknesses, opportunities and threats - GTRS

Strengths	Weakness
• Designated Ramsar Site • Forms a forest corridor of Churia and foothills • Growing conservation awareness of locals • Implementation of Tarai Arc Landscape programme • Presence of two management plans • Very high biological diversity • Good wildlife and aquatic habitat • View tower is constructed	• Not clear boundary • Weak enforcement of policies and legislations • Excessive grazing, fishing, bird killing • Growing human encroachment • Inadequate commitment from government and donor • Management plan yet to be endorsed • Poor policy and legislation awareness
Opportunities	**Threats**
• Opportunity to declare bird sanctuary and research centre • Located along Kathmandu-Delhi bus route • Located in wildlife corridor including trans-boundary corridor • Availability of raw materials and NTFPs in and around GTRS • availability of wild mango	• Decreasing water level • Deforestation fish poisoning • Large increase in resource use and exploitation over last five years • Growing waste and garbage • Religious encroachment • Urbanization

4.6.9 Potential areas for external interventions

Stakeholders during consultations and village workshops suggested several areas requiring intervention in GTRS for biodiversity conservation and poverty reduction. Suggested areas are summarized in Table 52.

Table 52: Potential areas suggested by stakeholder for external intervention

Biodiversity Conservation	Poverty reduction
• Promote conservation education • Control illegal fishing • Develop as research centre and bird sanctuary • Regulate recreational activities • Timely cleaning • Training programme to youth specially female on biodiversity conservation	• Promote IGA based on forest products and high value agricultural crops • Conduct adult literacy • Skill development training • Training related to tourism related enterprises youth • Promote eco and cultural tourism • Promote regulated recreational activities

The intervention areas suggested for GTRS by UG member and NUG member HHs for its conservation and continued use for irrigation are summarized in Table 53.

Majorities of HH from both the UG and NUG group suggested livelihood related activities like IGA promotion, skill development, tourism and medicinal and aromatic plant promotion (over 55 percent of UG member HHs and over 57 percent of NUG member HHs). Some 30.5 percent of UG member HHs and 31.3 percent NUG member HHs suggested for conservation of lake and its surroundings. Almost equal proportion of HHs (over 10 percent) suggested for creating conservation awareness and education programmes.

Table 53: Intervention areas suggested by HH for management of GTRS

	Non user		User		Total	
	No	percent	No	percent	No	percent
Conservation and management of lake	2	10.0	11	11.6	13	11.3
Conservation of forest resources	5	25.0	18	18.9	23	20.0
Income generating activities	5	25.0	26	27.4	31	27.0
Skill development training	3	15.0	14	14.7	17	14.8
Tourism	2	10.0	12	12.6	14	12.2
Conservation awareness and education	2	10.0	11	11.6	13	11.3
Medicinal and aromatic plant cultivation	1	5.0	3	3.2	4	3.5
Total	20	100.0	95	100.0	115	100.0

4.7 Lessons Learned and Conclusions

This sub-section of the chapter is devoted to drawing some conclusions from the field study and in flagging pertinent issues related to biodiversity conservation and poverty reduction. Presentation in this sub-section is further divided into four sub-sections. The first sub-section brings out issues related to biodiversity conservation in studied PAs and WSs. The second sub-section discusses issues related to conflicts, and the third sub-section discusses management-related issues, which is then followed by discussion related to poverty issues.

4.7.1 Conservation related issues

Varying interests of stakeholders: All the stakeholders have shown their interests over the PAs and WSs but for their own benefits. For instance, DDC/VDC/Municipality are interested in their "heritage" for generating income or collecting revenue by contracting private parties for fishing, collection of driftwood, quarrying of sand/stone, etc. On the other hand, the government line agencies operating around the PAs and WSs have their own set of interest over PAs and WSs such as using water for irrigation, improving farming systems, developing infrastructure, exercising legal power and authority governed largely by their official mandates. *In this context, conservation would be very difficult if diverse interests are not taken into account.* The current challenge is to find ways that represents the interests of the multiple stakeholders at the national, district, local or natural resource

unit level. The crucial aspect is to build on earlier developed participatory methodologies that ensure involvement and participation of local stakeholders in the design and management of programmes and projects at the local level. What is important is the need to identify and try to reach out to those affected groups, which may lack power and have been excluded in the past. Synchronizing interests and expected benefits of different stakeholders towards conservation is a major issue in the context of biodiversity conservation and poverty reduction. *This calls for a strong and functional coordination mechanism at the local level. In this context, the role of LSGA, 1999 becomes crucial. However, considering the fact that sector specific policies and legislations govern management of PAs and WSs, it is high time that these are reviewed objectively and made consistent and compatible to the implementation of biodiversity centered poverty reduction programmes in PAs and WSs.*

Scientific studies and their implications for field implementation: The PAs/WSs in the country are well known for their rich and diverse biological resources and for landscape beauty. Review findings clearly show disproportionate attention to research and development across these heritage sites. While disproportionate research coverage can be linked with inadequate research agenda within the management organizations and is often an outcome of interest of research of donors and conservation partners, substantial gaps exist in building research findings into management efforts. For example, neither animal sightings nor tourism activities are properly linked, nor is the poaching of animals to the research findings of animal behaviours. *While recognizing the need for frequent sharing of views of researchers and management personnel in formulating conservation strategies, further efforts would be required to set aside certain proportion of revenue generated from PAs and WSs for research and development such that more informed and updated basis are created for management decisions. This needs to be accomplished through annual budget provision.*

Regular monitoring of biodiversity conservation: The PAs/WSs are described more frequently in terms of birds and animals found in the areas. However, regular monitoring of birds/animals is not included as a regular programme. The issue is that there is different and occasionally contradicting information about birds/animals for want of authentic sources. *To a large extent, such a state of affair is the outcome of lack of monitoring system and is governed by the cost implication of wildlife monitoring. This will call for instituting a functional and sustainable monitoring system across PAs and WSs, and operating the system by diverting part of revenue generated from these PAs and WSs through annual budget.*

Low and varying level of local awareness: Field level consultations have clearly indicated poor and varying level of conservation awareness among the stakeholders. This is largely governed by the absence of a system both at the centre and field level to regularly inform concerned people about policy and legislative changes and by the virtual absence of conservation education program linked with local lifestyles. *This conclusion is based on the reporting of many stakeholders that their knowledge on conservation and related policies and legislation is low and that whatever they knew was out of their own interest. This calls for instituting a system of organizing forum at the local level to inform and debate on such issues.*

Illegal fishing, birds killing and collection of edible plants: Closely related to the issue of low level of conservation awareness of stakeholders is the issues of illegal fishing and birds killing, more prominent in the wetlands and poaching and illegal collection of NTFPs in the protected areas. The main reason behind these issues is the dependency of local people on the PAs and WSs for food and/or source of income. Persistence of poisoning of birds and fish in almost all the wetlands and illegal harvest of NTFPs across all the PAs studied emanates mostly from the failure of the concerned authorities to adequately compensating the loss the dependent population incurred out of declaring certain areas as PAs and WSs. While weak enforcement of policies and legislations is one of the responsible factors, failure to create adequate incentives for conservation is the main factor. *While not disregarding the likely positive impact of direct monetary compensations to those affected; payoffs would be much higher from efforts directed towards creating incentives to dependent population in diverting their interest from one of illegal use of PA and WS resources to conservation. This would mean reemphasizing creation of conservation centred alternative livelihood opportunities.*

4.7.2 Conflict related issues

Establishment of PAs and WSs largely has fulfilled the need of conservation. This however has overlooked the needs and aspiration of the people often resulting into conflicts. Increased wildlife population made possible through conservation effort has resulted into regular damage to life and properties of people around PAs and WS. Likewise, loss of traditional user rights on PA and WS resources, and varying interests of organizations in getting benefits have also contributed to the continued conflicts. The specific issues are highlighted further in subsequent paragraphs.

Wildlife damage: Wildlife damage is a serious consequence of conservation in the PAs/WSs directly affecting the welfare of dependent population. While no compensatory measures can be thought for human injury and casualty incurred due to tiger, rhino, elephant, bear and other attacks, lack of adequate compensatory measures against property and crop damages leads to human deprivation and escalation of poverty. Although a small segment of the society suffers from these problems, the impacts are manifold when considered the families and neighbourhoods touched upon by the incidents. *Although measures adopted in minimizing conflicts through declaration of BZ has resulted into better relationship between the management authority and the affected communities, it has failed to address the problem of individuals who actually suffer from the damage. Many individuals suffering most from wildlife damage claim that someone else in the community enjoys the power and authority at their individual cost by suppressing their sorrow on community name. This implies revisiting policies like BZ policy in this context to make it amenable in fully addressing individual concerns as well.*

Compensation against wildlife induced damage: Coined with the issue of wildlife damage is the issue of relief and compensation. There is no legal basis for relief and compensation against wildlife damage. The BZMC and other relevant organizations in some PAs are considering compensation schemes; its implementation is rather weak even in few instances where this has been applied like in RCNP. Victims are not satisfied with what they have been compensated for. For example, monetary relief to a bereaved family does not justify for any human injury and casualty. Similarly, compensation in proportion to seed requirements of the crops damaged do not practically match, since the amount of seed is insignificant compared to the full crop. There are occasional solutions to destroy problem animals, but in many cases, such animals had already created many problems before they are controlled. *The issue is even more severe where BZ has not been proposed or formally declared. Thus, there is an urgent need to develop working policy on relief and compensation to victims of wildlife damage.*

Sovereign rights over water and other resources: Some PAs/WSs are highly significant from the natural resources like water and forests. For example, ShNP and JRRS are the major source of water, for providing drinking water to Kathmandu and irrigation in Kapilvastu respectively. However, the local people are not fully benefited from the resources. The issue is that the local people are the custodian of the resources; whereas the consumers are somewhere and do not directly contribute to the benefit of the custodians. *This calls for finding ways to ensure that those who have lost their rights over resource use for use by others not traditionally entitled get adequately compensated. This implies instituting a system of diverting part of the revenue generated from non-traditional consumers to the benefit of those who have lost their traditional rights like in LNP.*

Conflicts among local organizations: Although both the LSGA 1999 and NPWCA, 1973 and BZR 1996 aimed to uplift the standard of living of the local communities but with their own style and approach. While DDC/VDC argues that LSGA 1999 is the latest legislation and should override the preceding legislations, BZMC and UCs think that national level activities like PA and WS management are outside the scope of DDC/VDCs. Moreover, BZMC/UCs feel that they are the major victims of wildlife damage, so they are entitled to receive special facilities like BZ. *Reiterating the earlier issue, it is urgent that these policies and legislations are reviewed objectively and made consistent and compatible to the implementation of biodiversity centred poverty reduction programmes in PAs and WSs.*

4.7.3 Management related issues

Multiple claimants over PAs and WSs: Interestingly, there are several claimants over the rights to manage and benefit from PAs and WSs. Although DNPWC is legally mandated to manage PAs, DDCs are interested to reflect conservation programmes and activities in PAs in their district plans and argue that should get part of revenue generated from PAs, which are the district-based resources. Similar claims are there from VDCs as well. In the case of wetlands where management authority varies with the location, aside from DDC and VDC, local NGOs and CBOs are claiming for management responsibilities like in GTRS and JRRS. *This problem is the reflection of failure to recognize the rights, roles and responsibilities of stakeholders and build these claims in the management system. This will call for formation of multi stakeholder forums to direct the stakes towards conservation and management of PAs and WSs.*

Coordinated approach towards conservation and development: At present management of PAs and WSs lies either with DNPWC or with DOI or with DOF. Activities of other district based line agencies like DADO and DLSO are also related to conservation and development. For example, crop and fisheries development in a district falls within the jurisdiction of DADO and that of livestock with DLSO. These organizations are operating independently. While no research programmes on repellent crops have been conceptualized and implemented by DADO, DLSO is least concerned about issue of cross breeding of domestic animals with wild animals inside the PAs. *Managing PAs and WSs independently for biodiversity conservation and poverty reduction will have little impact unless a coordinated approach is pursued. Lack of coordination between UGs formed by DADO in Kapilavastu with WUG of Banaganga Irrigation System is a vivid example. Thus, there is an urgent need to coordinate activities of all related line agencies at the district level through assigning this role to DDC and VDC which ever is appropriate.*

Confusion on boundaries of PAs and WSs: The issue of multiple claimants over management of PAs and WSs is also coined with the unclear boundary of several PAs and WSs. Boundary is a major issue in the field. In the case of the mountain NP like LNP, there are settlements inside the park boundary, while in other WS like GTRS, settlers have been forcefully evacuated. *For lack of clear boundary in the field, multiple claims are likely. This calls for clearly demarcating the boundaries with clearly defined roles and responsibilities of local claimants.*

4.7.4 Poverty related issues

Poverty as a compelling factor to illegal collection of natural resources: All the PAs and WSs studied in the field are rich in terms of biological resources. However, majorities of people living in and around these areas are poor and are highly dependent on these resources for livelihood. Land is a major livelihood resource and level of land operated by households is an indicator of poverty, over 60 percent of people around PAs and WSs are poor. Poor people who are physically displaced or displaced through loss of traditional means of livelihood have not been well accommodated by programmes like BZ and are still involved illegally in activities like fishing, birds hunting, and collection of grass (*pater*), firewood, dung, fodder, thatch and other NTFPs. *Unless alternative conservation centered livelihood opportunities are provided, poverty will be a major obstacle in biodiversity conservation in PAs and WSs. This calls for special targeted programs to divert destructive resource use behaviour into conservation focused behaviour.*

Harvesting of NTFPs and other resources: The PAs/WSs are the storehouses of medicinal plants and other renewable natural resources. On one hand local people are not allowed to collect medicinal plants from PAs for income generation, while on the other, as reported by local people, gangs of illegal traders collect medicinal plants and make money. Local people do not understand why this system prevails and why they are not allowed to collect the plants, which would otherwise be either, illegally collected or naturally decayed. *Resolving this issue would imply devising a system of sustainable harvest of such products and issuing selective permits to those mostly affected from PAs to collect these products. This however will require efforts to check misuse of permits issues to the*

benefits of those not targeted by the programme. Further, efforts to make best use of NTFPs for the benefit of most affected will have to go hand in hand with programmes targeted to link this with NTFP markets.

Wildlife farming a new possible income generating activity: Although many are unaware of the new policy on wildlife farming, they are interested to invest on the farming activities. The issue is mainly related to monitoring system since there is a doubt that the wildlife from the PAs/WSs could be mixed with the farm products. Another equally important issue is how best such a policy can benefit the poor and dependent population. *While operationalizing this policy would call for appropriate legislative measure, additional efforts would be required to check instances of legalizing poaching and making the policy pro poor.*

Prospects of high eco-tourism of PAs and WSs shadowed by prevailing security: The PAs/WSs are good examples of nature based tourism, such as KWR for birds, *Arna,* dolphin and boating. Likewise BTRS is famous for rhino, tiger and birds; ShNP for soft adventure and birds; LNP for red panda, snow leopard, trekking and mountaineering; JRRS for birds and archaeology; and GTRS for birds and landscape. Cashing the opportunity is a prime issue. *While ongoing security situation in the country is a major problem, lack of holistic planning for biodiversity conservation and poverty reduction in most of the PAs and WSs studied is a major hurdle in cashing the existing opportunities. Systematic efforts would thus be required to develop and implement conservation and tourism plans.*

5. Potential Areas of Intervention for Participatory Biodiversity Conservation and Poverty Reduction in Protected Areas and Wetland Sites

This chapter has two purposes. First, it is to translate study findings into meaningful intervention ideas of biodiversity conservation in PAs and WSs targeted to reduce poverty among people around these PAs and WSs in general, and those affected in particular. Secondly, it will elaborate these ideas into project/programme concepts. The chapter is organized into four sections. The first section sets the context. The conceptual and management frameworks are discussed in the second section. Guiding principles and strategic thrust areas to be emphasized for consolidating ideas into programme concepts and the modalities to be adopted in implementing these concepts are also discussed in this section. The third section identifies potential areas for Japan Nepal future cooperation in the biodiversity conservation and poverty reduction sector. Prior to this, it elaborates project concepts in terms of intervention activities. Finally, the conclusions and recommendations are presented int eh fourth section.

5.1 The Context

The basic context in the identification of potential intervention areas for biodiversity conservation and poverty reduction in PAs and WSs of Nepal is set by the richness and diversity of their flora and fauna, high dependence of rural mass on these resources for livelihoods and the need to conserve these resources for their future use (**Annexes 3, 4, 8 and 9**). These realities have necessitated pursuing a strategy of sustainable use of biodiversity for the socioeconomic betterment of the people who are poor and most affected by ongoing conservation initiatives in attaining the poverty reduction goal of the government spelled out in its current Tenth Plan. The Tenth Plan has fully recognized this opportunity and adopted a policy of wise use of country's biological resources.

The NBS 2002, a major government document in the protection and sustainable use of country's biodiversity sector, has outlined 17 cross-sector strategies of biodiversity conservation. Among others, integrating local participation, endorsing indigenous knowledge and innovations, women in biodiversity conservation, and increasing conservation awareness are of direct relevance to the present exercise. Likewise, the eight sector strategies outlined for the PAs include among others, adopting new model of protection and management, ensuring cross-sector coordination and capacity building of local communities. In a similar manner, participatory research, identification of appropriate institutions for coordination, user groups participation and raising awareness are the strategies outline for the wetland sector. These priorities of NBS 2002 provide both the context and the opportunity for the identification of potential interventions suggested in this section.

JICA's priorities in Nepal reflected in its Nepal Country Programme, and likely benefits of participatory approach followed under JICA assisted SABIHAA modality in the management of natural resources provide further opportunity for Japan Nepal cooperation in the conservation of biodiversity with strong consideration in poverty reduction. These issues have shaped the content of this chapter. Key among the contexts set above are the identified strengths, weaknesses, gaps and obstacles and lessons learned in the effective management of PAs and WSs as revealed by the review and field study carried out by the study team.

While some PAs and WSs have either a management plan or a management strategy framework, others have none. Such plans exist for KWR (prepared in 2002 but not endorsed yet), LNP (management plan prepared in 1977 and BZ plan in 2003) and GTRS (management plan prepared by IUCN in 1998). With due recognition of the merits of these plans, efforts are made in this chapter to identify and outline potential areas for Japan Nepal future cooperation in biodiversity conservation. Recent policy decisions of the government like National Wetland Policy 2003, Wildlife Farming Policy 2003, NGO Management of PAs 2003, revised Forest Policy and Irrigation Policy 2003 also provide opportunities for biodiversity conservation while considering livelihood issues.

5.2 Framework for Biodiversity Conservation and Poverty Reduction

5.2.1 Conceptual framework

Against the context set out in the last section, the conceptual framework adopted in outlining the potential intervention areas for biodiversity conservation and poverty reduction in priority PAs and WSs is guided by the goal, objectives and principle of the current Tenth Plan of Nepal[39]. Besides, the framework is also shaped by a number of key principles reflected in several government plans, policies, legislations and international commitments. These include integrating environmental conservation in development as enshrined by NEPAP, ensuring sustainability of development initiatives outlined in NCS, mainstreaming gender and equity in all aspects of development endeavors (HMGN/MoFSc, 1988; Revised Forest Policy, 2000), inculcating sense of ownership through community participation (Forest Act, 1993, BZ Regulation, 1996), honoring and harnessing indigenous and ethno botanical knowledge and local innovations (HMGN/MoFSC, 2002), local capacity building through human resource development and empowerment (HMGN/MoFSC, 2002 and BZ Regulation, 1996), and attacking poverty through targeting community development to the most needed (HMGN/NPC, 2003). After several years of experiences accumulated in implementing policing type of conservation policy, government has now realized and even learned that effective conservation would not be possible without integrating conservation with development and putting people at the centre of conservation.

Guided by the above considerations and enriched through interactions with stakeholders, review of different projects/programmes, available secondary literature as well as SABIHHA, this study has proposed a conceptual framework with four strategic pillars for biodiversity conservation centred poverty reduction through sustainable management of PAs/WSs (Figure 2).

The proposed framework is built around the four key principles of conservation and development namely (a) secured social justice, (b) empowerment, (c) participation and (d) sustainability; and four strategies comprising (a) diversifying livelihoods opportunities; (b) facilitating participatory conservation; (c) enabling policy, legal and institutional environments; and (d) enhancing institutional and organizational capacity.

The identified and proposed intervention areas would secure social justice through addressing gender and equity issues such as inclusions and participation, transparency, equitable sharing of costs and benefits in project or programme activities. Likewise, stakeholder empowerment would be enhanced by capacity building, through target group programme like POWER programme of SABIHAA, required to have greater stakeholder access to resources, organizational representation and decision-making. This would also require creating conducive environment through policies reviews and analysis.

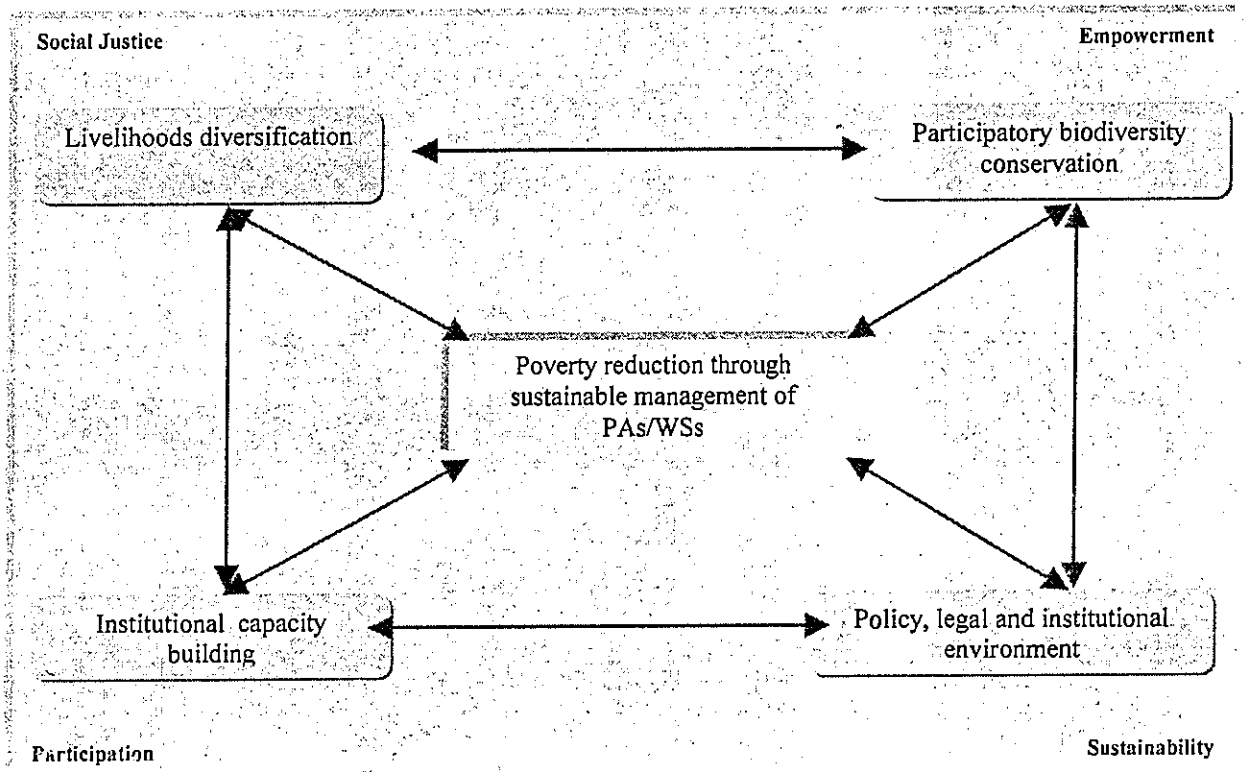
Internalizing biodiversity conservation among stakeholders is a key to the success of attaining the goal of biodiversity conservation. This requires mechanism to assure and ensure stakeholders of benefits from such conservation. One way of attaining this is through inculcating the sense of ownership of biodiversity resources among all stakeholders, which, among others, requires equitable participation of all stakeholders in the management of PAs/WSs and in sharing of ensuing benefits. This will require emphasis on and promotion of partnership and collaboration with local institutions and as well as formation of multi stakeholder coordination forum. Thus, the participatory biodiversity conservation would be the central focus in the management of all biodiversity conservation and poverty reduction areas identified and recommended by this study.

Recognizing that many innovative and highly promising development initiatives tested and promoted in Nepal including some of those in the natural resources conservation sector have failed to sustain after termination of external support, the principle of sustainability advocated in the identified

[39] Keeping poverty reduction as the sole goal of development planning through a four pronged strategy: broad based economic growth, social sector development, targeted group programmers and good governance, the Plan has emphasized involvement of local people on biodiversity conservation (HMGN/NPC, 2003)

intervention areas entails ensuring continued functioning of local organizations entrusted with the conservation and development responsibilities. This is ensured through inculcating the sense of ownership among stakeholders, linking individuals and organizations with the benefit stream ensuring equitable sharing of responsibilities and benefits as in the community forestry programme and by integrating conservation with development

Figure 2: The Conceptual Framework for the Project Design



Dwelling upon the overriding goal and the principles discussed above, intervention areas identified for biodiversity conservation and poverty reduction are hinged together along the four mutually inter-linked strategic pillars namely (a) creating enabling policy, legal and institutional environments; (b) institutional capacity building with more focus on existing local organizations, (c) diversification of livelihoods opportunities centered around biodiversity conservation and (d) entrusting greater roles to local stakeholders in biodiversity conservation following participatory approaches (participatory biodiversity conservation). Since these four strategic pillars are inter-linked, it would be necessary to intervene simultaneously in all the fronts in an integrated way. It would not be sufficient to intervene in single pillar independently.

Appropriate legal, policy and institutional environments are necessary for participatory biodiversity conservation and poverty reduction. This strategic thrust of the above framework entails comprehensive review of policies, legislations and institutions in terms of adequacy, consistency and appropriateness and has fully recognized this pre-requisite while identifying and suggesting intervention areas.

Institutional and organizational capacity building of all stakeholders starting from those involved in policy formulation and implementation to those at the operational level is essential in achieving the goal of biodiversity conservation and poverty reduction. This strategic thrust of the framework entails enhancing the capacity of stakeholders in building ownership and ensuring distributive justice through equitable distribution of responsibilities and benefits from conservation initiatives.

Another strategic thrust of the framework is the socioeconomic upliftment of the dependent population through biodiversity conservation. Remaining within the principle of sustainable livelihoods, this strategy seeks to utilize biodiversity in creating opportunities for the diversification of livelihoods and in reducing vulnerability. Some of the potentialities are community based tourism promotion, green enterprise development, reducing threats or conflicts, sustainable management and utilization of common property resources, etc.

The framework strongly advocates that conserving biodiversity within the PAs and WSs will not be possible unless all stakeholders in general and those affected most are brought in the mainstream of conservation. This is possible through participatory biodiversity conservation, which is one of the four strategic pillars of the framework. This strategic thrust ensures equitable and meaningful participation of all stakeholders in a coordinated and collaborative manner.

5.2.2 Management framework

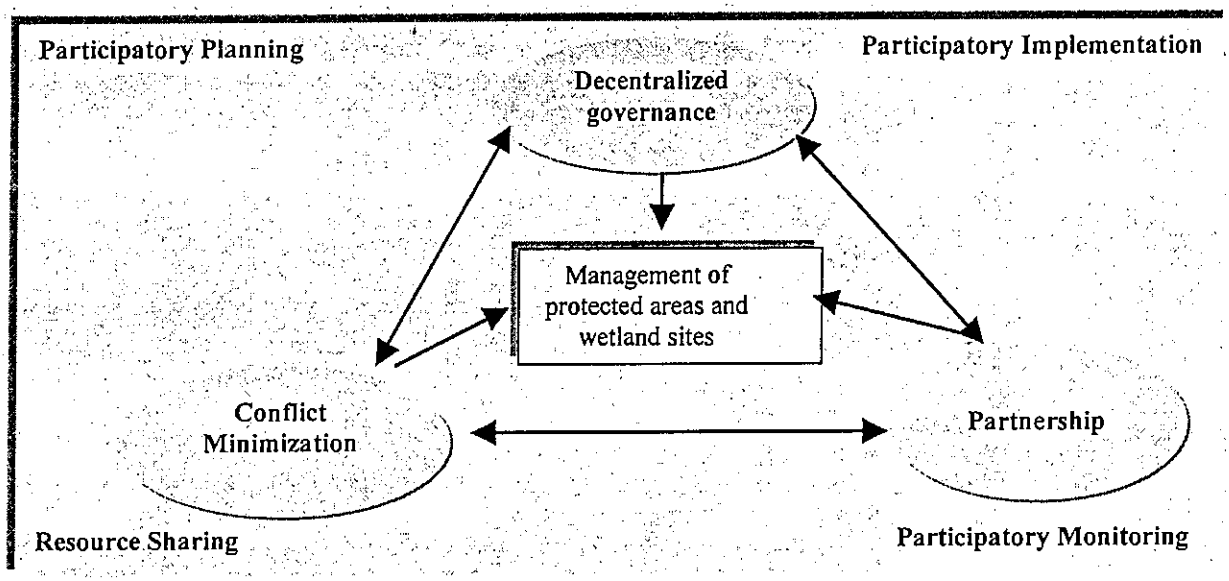
Attaining the goal of biodiversity conservation and poverty reduction along the conceptual framework described above requires streamlining PA and WS management along the requirement of the strategic areas within a sound management framework. This framework conceived for translating identified intervention areas into ground reality is built around three essential features of good governance for the sustainable management of the PAs/WSs on the one hand, and contributing towards the goal of poverty reduction on the other hand. These three features are decentralized governance, conflict minimization and partnership (Figure 3). This section elaborates these features in the context of managing the PAs and WSs and draws on findings from the review of management modalities adopted under different projects and programmes, lessons learned and their success stories. This is further supplemented by insights gathered through field study and interactions with the stakeholders. Following paragraphs elaborate on how these features would have to be incorporated in managing recommended interventions in the PAs and WSs.

Decentralized governance implies delegating decision-making authority to local stakeholders and requires capitalizing on local initiatives and existing organizations through mobilizing and entrusting responsibilities, and if necessary building such institutions. This is essential for addressing the local concerns and needs.

Partnership implies recognizing existing as well as potential roles of all stakeholders in PAs and WSs and building these into the management system with clearly defined roles, responsibilities and sharing of benefits. Recognizing that disadvantaged sections of society like the poor, *dalits*, ethnic minorities and women are often sidelined in development; special attention will be required to ensure their participation in management. Partnership also refers to strengthening relationship between the public and private sector involved in the management/conservation of the PAs/WSs. For the purpose of this section public sector includes line ministry's organizations like the DNPWC and the local bodies like the DDCs and the VDCs. Likewise, private sector includes both profit making and non-profit making organizations. Involvement of local stakeholders in the design and joint management of programmes and projects at a local level is crucial for sustainable partnership.

Conflict minimization is the third feature of the suggested management framework. Managing conflicts in protected areas is necessary for their sustainable management and contributing to improve the livelihoods of those who are affected. Therefore, it is necessary that people-centred objectives take precedence over other considerations. The management of bio-resources by the poor is of central relevance to questions of poverty alleviation and policy development. The following three principles are very much useful for minimizing conflicts: (a) focus on underlying interests, (b) involve all significantly affected stakeholders in a fair and respectful process and (c) understand the power that various stakeholders have, and take into account when trying to resolve a conflict (Lewis 1996).

Figure 3: Project Design Framework for the management of PAs and WSs



These three management considerations built in the suggested management modalities in operationalizing suggested interventions needs to be looked at in totality. Unless all the three features operate simultaneously and in a continuous manner, conceived management framework in attaining the goal will not be possible. This calls for regular participatory planning, implementation, monitoring and resource sharing.

5.3 Potential Areas of Japan Nepal Cooperation in Biodiversity Conservation Sector

Potential areas in poverty reduction through biodiversity conservation for Japan Nepal future cooperation have been identified at two levels. At the first level, all the 16 PAs of Nepal and 10 WSs of Tarai Nepal were prioritized using a set of eight criteria in the case of PAs and seven criteria in the case of WSs. The criteria used reflected priorities of the government and JICA Nepal covering biodiversity, socio-economy including poverty, conflict, programmes, partnership and global aspects of biodiversity conservation. Based on the prioritized list, which was endorsed through a consultative process, three PAs and three WSs were selected. The selected PAs and WSs thus qualified for potential Japan Nepal future cooperation in the biodiversity sector.

At the second level, following the conceptual and management framework described under sub-section 5.2, potential intervention activities under each of the four strategic thrust areas were identified based on the findings of review study and field study. This sub section of the chapter is thus devoted to the presentation of potential areas identified and recommended for Japan Nepal future cooperation. Presentation in this sub section is organized into two parts. In the first part, potential PAs and WSs identified and recommended for Japan Nepal future cooperation are presented and prioritized. In the second part, interventions required under each of the recommended PAs and WSs are presented.

5.3.1 Protected areas and wetland sites recommended for Japan Nepal cooperation

The three PAs and WSs suggested for Japan Nepal future cooperation is presented in Table 54 below.

Table 54: Suggested protected areas and wetland sites for Japan Nepal future cooperation

Protected areas	Wetland sites
1. Koshitappu Wildlife Reserve and Ramsar Site	1. Bishazari Tal Ramsar Site
2. Shivapuri National Park	2. Jagadishpur Reservoir Ramsar Site
3. Langtang National Park	3. Ghodaghodi Tal Ramsar Site

Above selections provide opportunities to direct Japan Nepal future cooperation in their attempts to address poverty issues through participatory and sustainable management of biodiversity in priority PAs and WSs of Nepal. The three PAs suggested have their unique features both in terms of their significance, location and management modalities. The KWR is a PA as well as a Ramsar Site located in the Tarai managed following BZ principles (not formalized) and is important from conservation of *Arna* and waterfowls. LNP is a PA located in the mountain region with rich biological resource and managed following formal BZ approach. ShNP is a PA in the mid-hills of Nepal forming a major watershed and major source of drinking water of the Kathmandu valley. It is currently managed under DNPWC's regular management framework.

In a similar manner, the three WSs suggested as potential wetland sites for Japan Nepal future cooperation represent three different types of wetlands with different priorities, significance and management modalities. The BTRS located in the central Tarai is linked to Khageri Irrigation System but managed by RCNP following formal BZ approach. The JRRS located in western Tarai is primarily meant for irrigation and managed by DOI following water users' involvement. The GTRS located in Far Western Tarai is meant for conservation within the forest policy of the government and is currently managed by DFO Kailali following community forestry approach.

5.3.2 Programmes suggested under recommended protected areas and wetland sites

Enabling Policy, Legal and Institutional Environments

In Nepal, policy and strategy are broad enough to effectively manage biodiversity on the one hand and reduce poverty on the other as to the objective of the Tenth Plan paper of the government. While effective enforcement of available policies and legislations is a problem, gaps in policies and legislations in terms of their adequacy, consistency and appropriateness are also observed (Chapter 2).

Although policies and legislations, which exist now in Nepal, have facilitated biodiversity conservation, further works are required in formulating required rules and bylaws in making these instruments effective. Actions would also be required to remove inconsistencies and inadequacies and amend existing one to make these more appropriate and even to draft new polices and legislations required to translate the spirit of poverty reduction through participatory conservation of biodiversity in PAs and WSs. Hence, an enabling legal and policy environment through comprehensive review and drafting of required instruments is a potential area for Japan Nepal future cooperation. Some of the key thrust areas to be addressed under this component include:

- Assess the implementation status of the different treaties and international commitments related to biodiversity conservation to which Nepal is a signatory and examine the importance and relevance of those treaties in the changed context.
- Carry out detail review analysis of different policies and legislations and identify areas to make this more pro-poor, gender sensitive and compatible to properly addressing Nepal's commitments on international conventions and treaties.
- Assist to refine/reform policy and legislations (Acts and Regulations) and operational guidelines for participatory biodiversity conservation in the context of sustainable utilization of wetlands, PA and BZ resources such as NTFPs and manage wetland resources in accordance with the National Wetland Policy 2002, the Forest Acts and Regulations, and LSGA 1999 and in the spirit of Ramsar Convention.
- Support amendments of existing policies, legislations and guidelines to make these pro-poor, gender sensitive and participatory amenable to incorporate good lessons leaned in the management of natural resources like WCC and POWER programme of SABIHAA.
- Identify research priorities and needs to formulate different policies and legislations as well assess the impacts of existing legislations on livelihoods of people according to NBS, 2002 and the roles that PAs/WSs fulfil in meeting the obligations pertaining to Kyoto Protocol in carbon sequestration and others.

- Support action research and piloting in areas like wildlife farming, biodiversity registration, participatory NTFP harvesting, integrated wetland management and develop operational guideline for effective implementation.
- Support the establishment of local biodiversity conservation trust fund in accordance to the NBS 2002.

These suggested areas of cooperation would be global in terms of covering all PAs and WSs of Nepal and would have direct impact on the biodiversity conservation centred poverty reduction efforts of Nepal and in preserving some of the world's endangered plants and animals.

Capacity Building of Organizations

Several organizations are involved directly or indirectly in the management of PAs and WSs. These include DNPWC under MoFSC at the centre; management authority, DDCs, line agencies and conservation partners at the district level; and VDCs, NGOs and CBOs at the operational level. Review study identified several gaps and problems common across the PAs and WSs, which were further, triangulated and verified during field study through interactions with management authorities and stakeholder organizations and during VDC workshops. The key issues pertaining to the organizational aspects of PA and WS management included inadequate coordination among stakeholders, absence or limited application of MIS, and inadequate trained and skilled human resources. In addition, inadequate training opportunities especially to lower staff and inadequate physical and communication facilities such as security posts, vehicles and communication equipment were other problems affecting organizational capacity of government organization. Likewise, poaching, poisoning, wildlife damage, policy confusions are other problems reported and observed during the field study.

Hence cashing the positive strengths of the past interventions and minimizing problems or issues, following intervention areas are suggested under capacity building component. The main objectives of this component are to enhance the capabilities of DNPWC, management authorities and local communities for sustainable management of PAs and WSs for biodiversity conservation and poverty reduction.

- Support enhancing capacity of DNPWC including its field based units and management authorities involved in PAs and wetland management through infrastructure development, logistic support and working environment improvement including skill enhancement.
- Facilitate and support preparation of strategic framework document, management plans including refinement and upgrading of management to address the opportunities provided by current policy reform as well as to make them more participatory, community focused and addressing the needs of poor and vulnerable people.
- Support formation of multi-stakeholders coordination forum to ensure better linkages and coordination in all aspects of PA and WS management and to enhance its capacity.
- Facilitate documentation of indigenous technical, organizational and management knowledge at the local level and support their incorporation in the management system.
- Support local organizations (DDCs, VDCs, NGOs and CBOs) capacity building programme targeted to participatory planning, implementation and monitoring as well as on participatory biodiversity conservation through training and exchange visits.
- Support full utilization of Management Information System including database and Monitoring and Evaluation.
- Support enhancing local organization capacity on biodiversity conservation through conservation education and eco-clubs promotion, and improved working environments and networking.

- Support institutionalizing WCC and POWER components of SABIHAA in the organizational landscape of PA and WS management to enhance capacity of disadvantaged groups in taking active role in management of local resources.

Livelihoods Diversification through Participatory Biodiversity Conservation

Although government's past initiatives towards biodiversity conservation through declaration of PAs have proved effective in preserving country's rare biological resources, this has also deprived many rural people from their traditional user rights of natural resources negatively affecting rural livelihoods. This is evident from the persistence of PA people conflict on resource use resulting into illegal harvesting of natural resources and poaching of even rare and endangered wildlife species. The negative impacts of preservation approach of biodiversity conservation on human livelihoods and its potential danger to conservation itself were realized in the nineties leading to policy shifts in conservation. The NBS 2002 has also suggested adopting comprehensive approach aimed at conserving forests, soil, water, and biological diversity and at the same time meeting the basic needs of people who are dependent on these resources for their livelihoods through consolidation and continuation of past successful efforts. Similarly, the Tenth Plan has prioritized creation of employment and income opportunities through conservation, enhancement and sustainable utilization of wildlife. The main objective of this component will be to empower local resources dependent communities to manage and protect adjoining ecosystems and species, and ensure participation of all stakeholders in various capacities. This implies conserving biodiversity and creating biodiversity centred alternative opportunities of rural livelihood. In this context, based on the review and field study insights gained, following set of participatory activities are suggested for enhancing and diversifying livelihood opportunities:

- Support protecting fauna and flora of PAs and WSs to maintain their biological diversity, wildlife habitat, and scientific value and scenic/landscape beauty and thereby creating an alternate basis of rural livelihood through programmes like conservation education
- Support programmes to strengthen and improve anti-poaching intelligence networks and instituting rewards systems by involving local communities in anti-poaching
- Support and assist development and implementation of species conservation action plans
- Support mainstreaming special target groups through special programs by respecting their traditional user rights
- Explore potentialities and promote ex-situ and in-situ conservation of medicinal plants and NTFPs
- Support enhancing the skill of dependent people to enable them to convert opportunities created by conservation efforts into livelihood supporting activities like operation of eco-friendly enterprises.
- Support complementary activities like tourism promotion through physical infrastructure development and targeted credit programme.
- Promote cooperatives for biodiversity conservation and community development

5.3.3 Site and programme specific recommended activities

Remaining well within the framework of biodiversity conservation and sustainable use of biodiversity for poverty reduction, a set of site specific and programme specific activities have been identified in respect of PAs and WSs recommended as potential Japan Nepal future cooperation areas. Considering the long-term nature of the conservation programs, the period of intervention may be scaled for a decade or so. This period also conforms to the NBS implementation strategy. Moreover, the World Park Congress reviews the protected areas in a decade period. As experienced in Nepal, the visible effects of conservation have been possible only after a decade or even longer period. Referring to **Annex 9** for details, Tables 55 and 56 summarize the identified activities for PAs and WSs respectively.

5.3.4 Exploring alternate management modalities

As revealed through reviews and field study different management regimes exits under PAs and WSs. For example, LNP, KTWRS and BTRS are managed under the BZ policy and ShNP under DNPWC's regular programme. While GTRS is managed by DFO, JRRS is managed by DOI. Community dependency syndrome is also different across these PAs and WSs having different management priorities and implications. While management priorities in BTRS and JRRS are on irrigation, priority in GTRS is on conservation. Likewise, management priorities in LNP and KWRS are on conservation and community development, and that in ShNP it is on watershed conservation for supplying drinking water to Kathmandu Valley. With due recognition of the priorities and prevailing management systems governed by different legislations, preliminary thoughts about the management systems to be adopted in operationalizing recommended programmes under Japan Nepal future cooperation in biodiversity driven poverty reduction strategy has been proposed separately for PAs and WSs. These are described in following paragraphs:

KWR: As mentioned earlier, this PA, also a Ramsar Site, is currently managed by DNPWC through its reserve office located at Kushaha, Sunsari with the active support of not yet formalized BZMC having a chain of UCs and UGs from all parts of the BZ. Except for targeting conservation as well as community development programmes to Target Groups representing the poor and disadvantaged people like women, *dalits*, poor and other occupational caste through incorporating POWER programme of SABIHAA, integrating conservation oriented local NGOs in the management; and reforming management system to make it decentralized, more participatory, transparent and accountable, no specific changes have been conceived at this moment. Detail exercise would, however be required during design stage in properly addressing these issues. Integrating WCC and POWER components of SABIHAA in the KWR would require some modifications in BZ regulations yet to be formalized pending formalization of BZ.

ShNP: This Park is currently managed by DNPWC as per its regular programme without any formal BZ support program. Along the periphery, a number of CFUGs are functional with the support of the three DFO. Although dissipating, several UGs centred around watershed conservation formed during implementation of watershed management projects supported by FAO still exist and can be revitalized and clustered around VDCs. This will require Shivapuri National Park Regulation to be drafted by incorporating essential features of BZ regulations with provisions for managing the park from the perspective of biodiversity and watershed and integration of essential features of SABIHAA modality of watershed conservation and community development. Apart from the above, efforts will be required to integrate conservation oriented local NGOs in the management; and to model management system to make it participatory, decentralized, transparent and accountable. Of all the protected areas, ShNP appears a promising area for proposed Japan Nepal cooperation in the biodiversity conservation sector.

LNP: LNP is currently managed by DNPWC through its park office located at Dhunche, Rasuwa with the active support of formal and full functioning BZMC having a chain of UCs and UGs from all parts of the BZ. Besides, the DSCO presence in the area including the BZ has been there for a long time with a chain of watershed user groups formed at settlement level. As in the case of KWR, efforts will be required to target conservation and community development activities to Target Groups by revitalizing and integrating existing user groups representing the poor and disadvantaged people like women, *dalits*, poor and other occupational caste through programmes like POWER of SABIHAA or similar programme that can accommodate well within BZ regulation, integrating conservation oriented local NGOs in the management; and reforming management system along the suggested management framework. Detail exercise would, however be required during design stage in properly addressing these issues.

BTRS: This wetland is currently under the management jurisdiction of RCNP located in Chitwan district that lies in the national forests within the formally declared BZ. Management is limited to antipoaching, protection and regular BZ program not specifically targeted at the wetland site of

international importance. Different management options can thus be visualized. First, communities around BTRS can manage this wetland along the principle of BZ community forest. Second, it can be managed by RCNP by defining a special Zone. Third, it can be managed by RNCP as any resource unit of RCNP but with additional and more focused conservation and development efforts. Adopting a particular system will however have to take into account the pros and cons arising out of its location. It is located in the national forest corridor linking RCNP with forest in the Mahabharat range and that it is a part of larger irrigation system irrigating almost 4,000 ha of land. Before resorting to a particular system, detail SWOT analysis of alternatives would be required. Irrespective of what particular system would be suitable and adopted, target groups representing the poor and disadvantaged people like women, *dalits*, poor and other occupational cast and conservation oriented local NGOs will have to be integrated in the management. Also instituting a system of decentralized governance, minimizing conflicts and partnership principles will have to be given special emphasis in the design stage.

JRRS: It is currently under the management jurisdiction of Irrigation Development Division 5 of the Western Regional Irrigation Directorate located in Taulihawa of Kapiavastu district. At present JRRS is not being managed as a wetland site of international significance but as a component of BIS. The BIS has a network of WUA in three tiers, which jointly with IDD is involved in contracting out fishing in the reservoir. Like in BTRS, different management modalities can be conceived and examined. First, BIS following National Wetland Policy can manage it. Second, it can be managed by the WUA by synchronizing irrigation and wetland policy. Third, it can be managed by national conservation organizations like DNPWC or KMTNC. As in the case of BTRS, these three alternatives have their own pros and cons arising particularly out of its priorities. Thus, before resorting to a particular system, detail SWOT analysis of alternatives would be required. Irrespective of what particular system would be suitable and adopted, target groups representing the poor and disadvantaged people like women, *dalits*, and other occupational cast and conservation oriented local NGOs will have to be integrated in the management. Also instituting a system of decentralized governance, minimizing conflicts and partnership principles will have to be given special emphasis in the design stage.

GTRS: Located in the Kailali district on the northern side of E-W highway GTRS is currently under the management jurisdiction of DFO Kailali but without any visible presence resulting into several organizational claimants including local NGOs, VDCs, DDC and the private sector. Over the past few years, a local NGO has been involved in organizing groups and in undertaking conservation as well as community development activities centred on GTRS and is occasionally supported by organizations like IUCN. Three alternative management modalities have been conceived for GTRS. First, DFO Kailali can manage this wetland by synchronizing Revised Forestry Policy and New Irrigation Policy and by increasing its functional presence and increased conservation and community development activities. Second, it can be leased to NGO or the Private sector (Kailali Chamber of Commerce and Industries). Third, it can be managed by national conservation organization like DNPWC or KMTNC. Appropriateness of a particular management modality will however needs careful examination in terms of its location in the forest corridor linking RBNP in Bardia and RSWR in Kanchanpur. As in the case of other WSs, these three alternatives have their own pros and cons arising particularly from its priorities. Thus, before resorting to a particular system, detail SWOT analysis of alternatives would be required. Irrespective of what particular system would be suitable and adopted, target groups representing the poor and disadvantaged people like women, *dalits*, and other occupational cast and conservation oriented local NGOs will have to be integrated in the management. Also instituting a system of decentralized governance, minimizing conflicts and partnership principles will have to be given special emphasis in the design stage.

Across all PAs and WSs, irrespective of which management alternative is pursued, it will have to have a well-defined and functional participatory monitoring and evaluation component.

Table 55: Potential intervention area specific activities in PAs recommended for possible Japan Nepal future cooperation

Strategy (Objective)	Program Areas		
	KWR	ShNP	LNP
I. Enabling Policy Environment (1. Policy Enhancement)	Policy Enhancement • Declare buffer zone • Endorse and implement KWR management plan • Develop policy and mechanism to compensate wildlife damage • Formulate policy on driftwood management • Prepare a legal base for wildlife farming policy • Develop biodiversity registration system • Amend protected species list in the NPWC Act to include endangered and vulnerable species • Coordinate with Koshi Project/Indian Government to conserve Koshi flood area outside KWR for Transboundary Ramsar Site • Formulate a legal framework to manage KWR resources by BZMC, KWR, DDCs, VDCs or users • Develop local biodiversity conservation fund	Policy Enhancement • Explore/declare buffer zone • Develop separate regulation • Develop policy and mechanism to compensate wildlife damage • Prepare a legal base of wildlife farming and NTFP collection for IGA • Develop biodiversity registration system • Amend protected species list in the NPWC Act • Formulate a legal framework to manage ShNP resources by BZMC, ShNP, DDCs, VDCs or users • Develop local biodiversity conservation fund • Prepare a management plan	Policy Enhancement • Establish a separate tourism unit • Develop a policy and mechanism to compensate wildlife damage • Formulate/implement provisions for equitable distribution of benefits in/out park boundary BZ • Prepare a legal base of farm wildlife for income generation • Develop biodiversity registration system • Develop a coordination mechanism on NTFP harvesting and trade • Establish transboundary cooperation and coordination • Develop antipoaching strategy • Amend protected species list in the NPWC Act • Formulate a legal framework to manage LNPBZ resources by LNP, BZMC, DDCs, VDCs or users • Develop local biodiversity conservation fund • Revise 1977 management plan
II. Institutional Capacity Development (2. Capacity Building, 3. Infrastructure Development)	Capacity building • Strengthen CBOs • Conduct CE training programs • Conduct training programs on tourism related entrepreneurship • Conduct technical and vocational training programs including ethnic handicrafts • Organize gender mainstreaming training/workshop to all stakeholders • Organize training program on NTFP cultivation, processing and marketing • Build the capacity of the KWR personnel • Develop NGOs capacity for facilitating and mediating CBOs and LGOs • Develop/establish MIS including database Infrastructure Development • Create new water holes outside the western boundary for livestock • Construct earthen roads outside the western embankment	Capacity building • Strengthen CBOs • Conduct CE training programs • Conduct training programs on tourism related entrepreneurship • Conduct technical and vocational training programs including ethnic handicrafts • Organize gender mainstreaming training/workshop to all stakeholders • Organize training program on NTFP cultivation, processing and marketing • Build the capacity of the ShNP personnel • Develop NGOs capacity for facilitating and mediating CBOs and LGOs • Develop/establish MIS including database Infrastructure Development • Maintain the existing roads • Improve local infrastructures • Develop facility of public health and veterinary service	Capacity building • Conduct training on CE, ecotourism and other vocations and trades • Strengthen CBOs • Conduct CE training for school teachers and other stakeholders • Conduct training programs on tourism/ mountaineering related entrepreneurship • Strengthen *Amchi* tradition along with NTFP cultivation, processing and marketing • Conduct training programs on TEVT including ethnic handicrafts • Organize gender mainstreaming training/workshop • Promote saving and credit and facilitate bank loan to STGs and link with rural micro finance • Build the capacity of the LNP personnel • Develop NGOs capacity for facilitating/ mediating CBOs and LGOs • Develop/establish MIS including database Infrastructure Development • Construct/maintain visitors infrastructures

Strategy (Objective)	Program Areas		
	KWR	ShNP	LNP
	• Create and maintain water bodies for the migratory and other water birds • Establish view towers at vantage points • Establish and/or improve administrative buildings and facilities • Promote alternate energy technology with subsidy • Construct/repair fencing • Develop fire control mechanism	• Improve traditional irrigation facilities • Construct tourism infrastructures • Construct/repair stone wall/barbed wire/wooden fence • Develop fire control mechanism	• Coordinate for realigning Dhunche-Ramche road • Support for irrigation canals • Establish view towers • Improve administrative physical infrastructures • Promote alternate energy • Construct/repair fence • Develop fire control mechanism
III. Participatory Biodiversity Conservation (4. Species Conservation, 5. Habitat Management, 6. Conservation Education)	Species Conservation • Update inventory of flora and fauna • Control domestic and feral livestock • Facilitate licensed hunting of problem animals • Prepare *Arna* action plan • Develop a gene pool/bank of wild water buffalo • Review and implement translocation proposal of wild water buffalo • Develop proposal for reintroducing vanishing species • Monitor endangered and symbolic species • Control wild elephant by appropriate means • Conduct antipoaching operations • Regulate over-fishing, and control fishing during the breeding season • Install alert devices in the high tension electricity line Habitat Management • Manage KWR by creating three management zones • Manage the reserve in blocks • Control growth of weeds, and disturbance during breeding season • Control heavy grazing and fire • Promote community forestry • Monitor changes in the grasslands and manage accordingly. • Develop alternative grazing areas for livestock • Develop/review proposed corridor, connectivity and habitat extension Conservation Education • Launch CE programs for schools and STG	Species Conservation • Prepare and update inventory • Monitor birds, butterflies and selected mammals • Control problems of wild boar and other species • Repair/increase the stonewall fence • Facilitate licensed hunting of problem animals • Conduct research on biodiversity/ecology and other relevant fields • Continue Rhododendron plantation and nursery • Conduct antipoaching operations Habitat Management • Manage ShNP by creating three management zones • Manage forests in blocks • Manage watershed by plantation/ soil conservation/ bioengineering • Establish fire-fighting unit • Manage water regulatory systems • Develop alternative grazing • Promote alternative energy program • Conduct research on resource's sustained regenerative capacity Conservation Education • Develop/establish National Conservation Education Centre as per MPFS • Launch conservation education programs • Organize study tours and field visits	Species Conservation • Prepare/update inventory of flora and fauna • Monitor symbolic species and endemic birds • Conduct antipoaching operations • Strengthen veterinary program of line agencies • Promote alternative of Thingre salla as flag posts • Protect threatened/vulnerable plant species • Prepare Red Panda action plan Habitat Management • Manage pastures by promoting indigenous techniques • Manage forests to enhance natural regeneration • Control landslides on the slopes and Kharkas • Establish fire fighting unit • Promote alternative energy program • Monitor major habitats where human activities and industries are prominent • Manage LNPBZ by creating three management zones • Introduce sustainable harvesting of NTFPs • Identify/map protection of vulnerable habitat Conservation Education • Launch conservation education programs • Organize study tours and field visits • Organize special trips for celebrities and media people • Organize on-site seminars/public forums on pertinent issues • Establish a biodiversity training, research and documentation centre • Provide STGs with free computer education and study tours • Conduct adult literacy programs • Promote cultural heritage linking with nature

Strategy (Objective)	Program Areas		
	KWR	ShNP	LNP
	• Organize study tours and field visits • Organize special trips for celebrities and media people • Organize national level awareness programs • Furnish existing visitor centre/museum • Conduct adult literacy programs • Provide STGs with free computer education and study tours • Organize community based antipoaching campaigns • Organize World Wetland Day	• Organize special trips for celebrities and media people • Organize on-site seminars and public forums on pertinent issues • Establish a centre for flora and fauna documentations • Conduct adult literacy programs	
IV. Livelihood Diversification (7. Tourism, 8. Eco-friendly Enterprises, 9. Traditional Uses)	Tourism Development • Develop tourism and recreational facilities • Implement code of conducts for all stakeholders • Encourage village lodges and teashops • Develop and promote cultural conservation • Encourage proper sanitation standards • Promote KWR at nearby towns • Develop ecotourism master plan Eco-friendly Enterprises • Develop controlled fishing as IGA • Encourage community commercial fish farming • Encourage farmers for planting a row or strip of wildlife deterrent unpalatable crop • Promote stall-fed improved animal husbandry • Introduce wildlife farming • Promote ethnic handicrafts by providing market access • Promote saving and credit program and link with rural micro-finance development Traditional Uses and Concessions • Allow regulated collection of *khar-khadai* and *pater* Issue fishing license avoiding the breeding season • Introduce collection of MAPs on a sustained/rotational basis • Allow collection of driftwood by User Groups under BZMC supervision • Conduct research on resource's sustained regenerative capacity	Tourism Development • Establish a visitor information centre • Designate tourism facilities/sites • Link tourism with local economy • Implement code of conducts • Encourage village lodges and teashops • Develop ecotourism master plan Eco-friendly Enterprises • Develop agro processing/storage facilities • Strengthen activities of line agencies on agriculture, horticulture, livestock • Develop MAPs nursery, domestication, cultivation and sustained collection • Promote alternative farming techniques with wildlife repellent crops • Promote stall-feeding/ improved animal husbandry • Introduce farming of wildlife species • Link lending mechanism with rural micro-finance development Traditional Uses and Concessions • Allow regulated and sustainable collection and use of natural resources such as water and forest products • Conduct research on sustained yield of NTFP/MAP, sand and stone	Tourism Development • Prepare Tourism Management Plan • Develop tourism facilities • Promote domestic pilgrimage tourism • Develop/promote cultural conservation in ecotourism • Develop basic services/facilities • Implement code of conducts • Conduct training on hotel/lodge management, nature guide, cooking, entrepreneurship development and other tourism related activities Eco-friendly Enterprises • Develop agro processing/storage facilities • Strengthen activities of line agencies for enhancing agriculture, horticulture and livestock • Develop MAPs nursery, domestication, cultivation • Introduce farming of wildlife • Promote animal husbandry • Conduct research on cultivation of wild animal deterrent cash crop • Link lending mechanism with rural micro-finance development Traditional Uses and Concessions • Allow regulated grazing, collection of fodder and fuel wood in blocks • Issue fishing license to traditional fisher folks • Introduce collection of MAPs on a sustained/ rotational basis • Allow collection of driftwood by UGs under BZMC supervision • Conduct research on sustained yield of NTFP/MAP, fish, sand and stone

(Note: Details are given in **Annex 9**)

Table 56: Potential intervention area specific activities in WSs recommended for possible Japan Nepal future cooperation

Strategy (Objectives)	Program Areas		
	BTRS	JRRS	GTRS
I. Enabling Policy Environment (1. Policy Enhancement)	Policy Enhancement • Create environment for implementing RCNP management plan • Prepare legal framework for bird sanctuary • Develop a policy and mechanism to compensate wildlife damage • Prepare a legal base for wildlife farming • Issue fishing license to traditional fisher folks • Develop biodiversity registration system • Formulate a legal framework to manage BTRS resources by BZMC, DDC, Municipalities, VDCs, RCNP and Chitwan DFO or users • Develop local biodiversity conservation fund	Policy Enhancement • Prepare legal framework to develop JRRS as a bird sanctuary • Prepare a management plan • Prepare a legal base of wildlife farming • Issue fishing license to traditional fisher folks • Develop biodiversity registration system • Formulate a legal framework to manage the JRRS resources by the DFO, Niglihawa VDC and the local communities • Develop local biodiversity conservation fund	Policy Enhancement • Create favourable environment for implementing GTRS management plan • Prepare legal framework to develop GTRS as a bird sanctuary • Develop a policy and mechanism to compensate wildlife damage • Prepare a legal base for wildlife farming • Issue fishing license to traditional fisher folks • Develop biodiversity registration system • Develop a mechanism for private sector investment • Formulate a legal framework to manage GTRS resources by DFO, DDC/VDCs and users • Develop local biodiversity conservation fund
II. Institutional Capacity Development (2. Capacity Building, 3. Infrastructure Development)	Capacity building • Strengthen CBOs • Conduct CE training for school teachers and other stakeholders • Conduct training programs on tourism entrepreneurship • Conduct training on TEVT including ethnic handicrafts • Organize gender mainstreaming training/workshop to all stakeholders • Organize training program on NTFP cultivation, processing and marketing • Conduct training for management authority and stakeholders. • Develop NGOs capacity for facilitating/ mediating CBOs and LGOs • Develop/establish MIS including database Infrastructure Development • Create new water bodies • Revive "Laxmi Tal" • Maintain the Khageri canal and its structures • Construct tourism infrastructures • Construct a motor road connecting BTRS with	Capacity building • Strengthen CBOs • Conduct CE training for school teachers and other stakeholders • Conduct training on tourism entrepreneurship • Conduct TEVT training including ethnic handicrafts • Organize training on NTFP cultivation, processing and marketing • Organize gender mainstreaming training/workshop to all stakeholders • Conduct training programs to the management authority and stakeholders • Develop NGOs capacity for facilitating and mediating CBOs and LGOs • Develop/establish MIS including database Infrastructure Development • Maintain canal system and engineering structures • Tame the Banaganga river to control soil erosion and flood • Construct tourism infrastructures • Improve community infrastructures	Capacity building • Strengthen CBOs • Conduct CE training for school teachers and stakeholders • Conduct training on tourism entrepreneurship • Conduct TEVT training including ethnic handicrafts • Organize training on NTFP cultivation, processing and marketing • Organize gender mainstreaming training/workshop to all stakeholders • Conduct training for management authority and stakeholders. • Develop NGOs capacity for facilitating and mediating CBOs and LGOs • Develop/establish MIS including database Infrastructure Development • Construct soil conservation structures • Construct tourism infrastructures • Construct parking facilities for the transient visitors • Develop basic community facilities • Construct/repair barbed wire/wooden fence • Develop fire control mechanism

Strategy (Objectives)	Program Areas		
	BTRS	JRRS	GTRS
	Sauraha • Improve community infrastructures • Construct/repair fence/trench • Develop fire control mechanism		
III. Participatory Biodiversity Conservation (4. Species Conservation, 5. Habitat Management, 6. Conservation Education)	Species Conservation • Prepare and update inventory of flora and fauna • Monitor migratory and resident birds and symbolic mammal species • Conduct antipoaching operations • Regulate over-fishing and control fishing Habitat Management • Manage forests in blocks • Manage upstream watershed • Manage water regulatory systems • Control growth of weeds • Remove excessive weeds and non-biodegradable materials from the lakes • Develop alternative grazing areas • Maintain sand level during cleaning of cannel • Manage reservoir by creating management zones Conservation Education • Conduct CE in schools • Organize study tours and field visits • Organize special trips for celebrities and media people • Organize on-site seminars and public forums on the pertinent issues • Organize national level awareness programs • Establish a museum of plant and animal at Tikauli • Conduct adult literacy programs • Organize World Wetland Day	Species Conservation • Prepare and update inventory of birds • Monitor migratory and resident birds • Conduct antipoaching operations • Regulate over-fishing and control fishing Habitat Management • Manage the remaining forests • Explore possibilities of creating new bird habitat • Explore possibilities of linking JRRS with the upstream watershed • Remove excessive weeds and non-biodegradable materials • Level tbe undulating surface of the reservoir • Develop alternative grazing areas • Manage reservoir by creating management zones Conservation Education • Conduct CE in schools • Organize study tours and field visits • Organize special trips for celebrities and media people • Organize on-site seminars and public forums on the pertinent issues • Organize national level awareness programs • Establish a visitor centre on birds • Conduct adult literacy programs • Organize World Wetland Day	Species Conservation • Prepare and update inventory of flora and fauna • Monitor birds and symbolic mammal species • Conduct antipoaching operations • Manage wild boar by controlled and licensed hunting • Regulate over-fishing and control fishing Habitat Management • Manage forests in blocks to enhance natural regeneration • Manage upstream Churia watershed • Manage water regulatory systems • Control growth of weeds for birds nesting and roosting • Remove excessive weeds and non-biodegradable materials • Develop alternative grazing areas • Manage reservoir by creating management zones Conservation Education • Conduct CE programs in schools • Organize study tours and field visits by the students and teachers • Organize special trips for celebrities and media people • Organize on-site seminars and public forums on pertinent issues • Organize national level awareness programs • Establish a museum/visitor centre with a collection of plant and animal specimens • Conduct adult literacy programs • Organize World Wetland Day
IV. Livelihood Diversificatio n (7. Tourism, 8. Eco-friendly	Tourism Development • Develop tourism facilities • Develop tourism and recreational infrastructures • Develop/promote culture in ecotourism • Implement code of conducts • Develop a tourism master plan Eco-friendly Enterprises • Develop a system of controlled fishing as alternate	Tourism Development • Develop tourism facilities • Develop recreational and tourism infrastructures • Implement code of conducts • Organize Niglihawa fair on a regular basis • Promote culture in ecotourism • Develop a tourism master plan Eco-friendly Enterprises	Tourism Development • Develop tourism facilities • Develop resting places for the transient visitors • Promote culture in ecotourism • Implement code of conducts • Develop a tourism master plan Eco-friendly Enterprises • Develop a system of controlled fishing as IGA

Strategy (Objectives)	Program Areas		
	BTRS	JRRS	GTRS
Enterprises, 9. Traditional Uses)	IGA • Promote stall-fed improved animal husbandry • Introduce wildlife farming • Promote ethnic handicrafts by providing market access • Link lending mechanism with rural micro-finance development <u>Traditional Uses and Concessions</u> • Allow regulated and sustainable collection and use of natural resources such as water and forest products • Conduct research on sustained yield of NTFP/MAP, fish, sand and stone	• Develop a system of controlled fishing as IGA • Promote stall-fed improved animal husbandry • Introduce wildlife farming • Promote ethnic handicrafts by providing market access • Promote saving and credit and facilitate bank loan to STGs • Link lending mechanism with rural micro-finance development <u>Traditional Uses and Concessions</u> • Allow regulated and sustainable collection and use of natural resources such as water and forest products • Conduct research on sustained yield of NTFP/MAP, fish, sand and stone	• Promote stall-fed improved animal husbandry • Introduce wildlife farming • Promote ethnic handicrafts by providing market access • Promote saving and credit program and facilitate bank loan focused to STGs • Link lending mechanism with rural micro-finance <u>Traditional Uses and Concessions</u> • Allow regulated and sustainable collection and use of natural resources such as water and forest products • Conduct research on sustained yield of NTFP/MAP, fish, sand and stone

(Note: Details are given in **Annex 9**)

5.4 Conclusions and Recommendations

On the basis of review and field study findings, it is concluded that addressing biodiversity conservation and poverty reduction concerns require concentrating efforts in KWR, LNP and ShNP among the protected areas; and BTRS, JRRS and GTRS among the wetlands. These adequately reflect national as well as international priorities covering biodiversity, socio-economic including poverty, conflict, management, partnership and policy concerns. Irrespective of which particular PA and WS is selected, attaining the twin objective of biodiversity conservation and poverty reduction will call for special attention in addressing a number of pertinent issues that are either not addressed or addressed insufficiently at the moment. The major issues to be addressed are equity, empowerment, participation and sustainability. Addressing these issues in the objective context would mean directing interventions in creating enabling policy; legislation and institutional environments; enhancing and building stakeholder capacity; diversification of biodiversity-conservation-centred livelihood opportunities, and conserving biodiversity through participatory approach. Enhancing the effectiveness of the interventions in these four strategic areas also implies instituting a management system that ensures good governance, minimizes conflicts and promotes partnership within each PA and WS recommended for Japan Nepal future cooperation in the sector.

Driven by the objective and conclusions reached from review analysis and field study of selected PAs and WSs, it is recommended that Japan Nepal future cooperation in the natural resources management sector be focused on all or anyone of the three PAs and three WSs identified as priority areas for biodiversity conservation and poverty reduction. Major strategy specific programmes included under each PA and WS recommended for consideration would require further scrutiny while preparing detail program document. Similarly, alternative management options indicated in this report will require detail examination.

Prioritizing future interventions even within the three recommended PAs and WSs would mean re-evaluating these PAs and WSs based on the major thrust areas of the present study. Potential impacts of planned interventions in biodiversity conservation, conflict minimization and poverty reduction, and building past experience of JICA-HMG/N cooperation in natural resource management sector in managing PAs and WSs are the two major thrusts of the present study. Using appropriate criteria, these PAs and WSs were re-evaluated.

Table 57: Prioritization of recommended protected areas and wetland sites using criteria reflecting study priorities

Criteria	Prioritized protected areas			Prioritized wetland sites		
	KWR	ShNP	LNP	BTRS	JRRS	GTRS
Potential impact indicators (1)						
Biodiversity impact	5	4	5	5	4	4
Conflict impact	3	3	1	5	4	5
Poverty impact	2	3	1	4	4	3
Building past experience	2	3	1	1	3	3
Total score	**12**	**13**	**8**	**15**	**15**	**15**
Differentiating criteria						
Existing/Forthcoming donor support (2)	1	3	2	1	3	2
Existing CBO network (1)	2	1	3	3	3	2
Grand Score	15	17	13	19	21	19
Priority ranking	**II**	**I**	**III**	**III**	**I**	**II**

Notes:

(1) Same scores as used previously is used

(2) Score of 3 is given to a PA and WS when neither donor exists now nor is foreseen in near future; score of 2 is given when limited donor support exists and 1 when visible donor support exists.

In re-evaluating these PAs and WSs from biodiversity impact perspective, the same indicators, variables and scores used earlier (Chapter 3) were used. While the size of dependent population per unit area of PA and WS was used in assessing the potential conflict impact, proportion of landless and poor people proxied through size of operated land was used is assessing the potential poverty reduction impact. In a similar manner, possibilities of replicating SABIHAA in full or in part in these PAs and WSs were used to reflect past experience of JICA-HMG/N cooperation.

Results of re-evaluation of the three PAs and three WSs using the above-mentioned criteria are furnished in Table 57. As indicated in the Table, among the PAs evaluated, ShNP ranked first followed by KWR and LNP. However, in the case of wetlands, all the three WSs emerged to have same priority. This necessitated including a set of differentiating criteria. The differentiating criteria used included existing and or forth-coming donor support and presence of CBO network. These differentiating criteria were also applied in PA as well to see their effect. With the inclusion of differentiating criteria, among the three WSs, JRRS ranked first followed respectively by GTRS and BTRS. Ranking of PAs remained unchanged even after inclusion of the differentiating criteria.

Based on the result, it is recommended to pick ShNP among the PAs and JRRS among the WSs if Japan Nepal future cooperation in biodiversity centred poverty reduction programme has to be focused only in one PA and WS.

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Attachment 1 Term of References

Terms of References for a study on Poverty Reduction through Sustainable Management of National Park and Wet Lands in Nepal: Processes, Modalities, Impacts and Identification of areas for Future Support

I Background

I.1 Overall situation:

Nepal has biological richness of both Indo-Malayan and Palaearctic realms, including endemic flora and fauna. With only 0.1 percent of the world's total area, Nepal possesses over 2 percent of the world's flowering plants, about 8 percent of the world's bird species, and about 4 percent of the world's mammal species.

Nepal is one of the richest countries in the world in biological diversity. So far, it is represented with 118 ecosystems with 75 vegetation types and 35 forest types where 246 flowering plants are recorded as endemic. It is estimated that more than 6,500 species of flowering plants, over 1,500 fungus species, over 350 lichens species, about 175 species of mammals, 836 bird species, 147 reptile and amphibian species, 180 species of fish, and 640 species of butterfly and over 6000 species of moth are found in Nepal.

The total area declared by the Government for conservation through several means is more than 16.5 percent of the national surface area. If the demarcated buffer zone of all parks and reserves are taken into account the total area under conservation may exceed 25 percent. Although initiatives to protect forest biodiversity in Nepal has a long history, systematic effort to launch effective conservation program through establishment of protected areas began only in 1960. Since then, nine national parks, three wild life reserves, three conservation areas one hunting reserves, four Ramsar sites have been established in the country.

I.2 National Resources Conservation VS Peoples' Development

While the initiative by the government has helped protection of rare plant and animal species and led to conservation of bio-diversity, protection of parks and wild life reserves for biodiversity resources has come into direct conflict with local communities. This broke the traditional linkage between communities and natural resources by prohibiting them from using these resources to meet their survival needs on a daily basis. Communities suffered due to their lack of access to natural resources within the boundaries of protected areas resulting into direct loss of food hitherto collected from protected areas and indirect loss due to deprivation of livestock and crops.

Experiences of growing conflicts between the communities and the protected area over the years led to the realization in the government that protecting the flora and fauna in the protected areas would not be easy and sustainable unless due considerations are given to traditional rights of people to the resources in the protected areas. This realization called for formation of community institutions and bringing these organizations as partners in the conservation of natural resources in the protected areas. This led to the enactment and implementation of Buffer Zone Management Regulation in 1996 under National Parks and Wildlife Conservation Act, 1993 (fourth amendment). This has followed implementation of Buffer Zone Management program in seven protected areas and its buffer zone areas by forging partnership between community institutions and the government.

I.3 Efforts made by HMG/N:

The concept of Buffer Zone management through community-based institutions in a sustainable manner has been initiated to make better harmony with the national parks and resources management, but in the actual sense, there are many things that are still to be done to realize them. The policies and legislation from the government has initiated (as follows) but their real implementation in order to have harmonious relation between sustainable livelihood improvement system of the people and the better management of national park is yet to be realized effectively in sustainable manner. However, the efforts on the policies and legislation made by HMG/N in this respect are quite commendable. Those initiatives by HMG/N's are the 2002 Nepal Bio diversity Strategy and the "Bio Diversity Implementation Plan" and Nepal Environmental Policy and Action Plan prepared in 1993.

In addition to these protected areas, there are about 242 wetland sites in different part of Nepal. Of these, about 67 percent are in the Tarai and the rest 33 percent in the hills and mountains. These wetlands are rich in bio diversity and are known to regularly support more than 200,000 waterfowls during peak season. In addition, these wetlands are home for large number of rare plant species (HMG/N, 2002). In addition, these wetlands have now been used for a variety of purposes in support of rural livelihoods. Although systematic efforts to study wetland of Nepal started recently, lack of legal provisions to regulate their use have resulted into rapid degradation and Bio Diversity Profile Project has listed a number of wetland sites in Nepal that need legal protection.

I.4 JICA's involvement in the Sector :

JICA's cooperation in the forestry sector started in 1991 with the implementation of Forest Extension Project (1991-1994). This project laid the foundation for the development of the concept of ***Forest/Watershed Conservation through Community Development*** putting the emphasis on community participation and its capacity building. Based on this, JICA's next cooperation with HMG/N in the forestry sector began with the implementation of Community Development and Forest/Watershed Conservation Project (CDFWCP) in Kaski and Parbat districts in the Western Development Region. in 1994. The counterpart organization in HMG/N was Department of Soil Conservation and Watershed Management under the Ministry of Forest and Soil Conservation.

The first phase of the project was completed in July 1999. During the first phase, various integrated activities like income generation, gully control, foot trail improvement, school building construction, forest and fodder tree plantation and others related to the watershed management were implemented by mobilizing communities in 10 VDCs of two districts.

Successful accomplishment of the first phase project was followed by HMG/N's request for the second phase project. The goal of this second phase project was poverty alleviation and improvement of the natural environment in hills of Nepal through the active management of community resources by the people. The implementation of the second phase project began in July 1999. Within the goal of poverty alleviation, the main purpose of this phase of the project was to develop a model, which not only ensured participatory community resources management on an equitable and sustainable basis with active involvement of the people in its process of planning, implementation monitoring and evaluation but also can be replicated in the other hill areas of Nepal. This second phase of the project has been implemented following different approaches of institutional development by bringing in several new project activities.

In the course of implementing the project, a model called ***Samudaayik Bikaas Tathaa Hariyaali Aayojanaa*** with its acronym ***'SABIHAA'*** meaning **Community Development and Greenery Project** has been developed. The intrinsic reason to have this acronym for this project is to inculcate the value of participatory community development among the members and gradually develop their ownership of the concept of community development through sustainable management of forest-based resources in the end.

JICA Nepal office has come up with the JICA Country Program 2003 for Nepal. Under the country program, management of the natural resources has been pointed out as one of the priority sectors considering the poverty reduction goal of His Majesty's Government of Nepal. Since poverty reduction and the judicious management of the natural resources goes hand in hand, extending JICA's cooperation in this priority sector would not only require developing comprehensive understanding of the sector but also demand following a holistic approach in program development and implementation.

II Rational of the Study

JICA Nepal has recently revised and improved its JICA Country Program 2003. This program has stressed poverty reduction as the final goal of its cooperation in Nepal. This focus is fully consistent with Nepal long-term development goal, which, as spelled out in its Tenth Plan, as poverty alleviation. Implementation of JICA's country program thus implies assisting HMG/N in supporting development and subsequent implementation of programs that lead to poverty alleviation. In this context, JICA's initiative to develop and help implement any natural resources management project focusing mainly on bio-diversity conservation in national parks, and the wetlands through community participation, has direct bearing on poverty alleviation and natural resources conservation, would add another milestones in the history of Japan-Nepal Cooperation

JICA's cooperation in the green sector of Nepal started with the implementation of Forest Extension Project in 1991 and continued with its subsequent follow-up projects. All of these projects were focused on tying up of community development work with promotion of greenery through participatory approach. However, in these projects no attention was paid on exploring the ways to improve the living standard of people by considering the conservation of wild life in protected areas and wetlands management.

Considering the importance and potentials of wild life conservation between communities residing in near by areas of national park and the wetlands, JICA has thought of sharing its positive experiences gained and the lesson learned during the course of its past cooperation in the forestry sector in Nepal. In this process, JICA with the collaboration of HMG/N would like to examine the possibilities for extending its technical cooperation in the management of national parks, wildlife reserves that will lead towards the improvement on the socioeconomic situation of people to be affected from such initiatives through development and its subsequent implementation of participatory natural resources management. The present study, apart from indicating possible areas of JICA's cooperation in these sectors, would also elaborate on potential projects in the area of national park and wetland biodiversity conservation and recommend for detail design.

Since the establishment of Department of National Park and Wildlife Conservation under the Ministry of Forest and Soil Conservation in 1980 several projects and programs have been implemented in this sector with the assistance of various donors. Although the goal and objectives of these efforts have been similar, contents and implementation modalities of such efforts vary depending upon the framework set by donor.

Despite the fact that these efforts have made significant achievements respectively differences are likely both in terms of level of community participation, impacts on bio diversity conservation and welfare of people/ communities. In this context, it would be worthwhile to have a comprehensive stock taking of these efforts, examine the modality followed in involving people/communities in the management and assess the impacts. Such an exercise would provide who has done what and what achievements and impacts have been made so far.

Considering the fact that wetland and national parks of Nepal, despite their importance in terms of their diverse bio diversity and means of livelihoods for rural people, have not received much or adequate attention so far either through policy/legal provisions and/or through donor assisted projects[40] and are in the verge of virtual collapse, thus the comprehensive study of national parks and wetland of Nepal from the perspective of developing feasible projects/programs would provide JICA a meaningful entry point for extending its cooperation for the sustainable and participatory bio diversity conservation in Nepal

Despite the deliberate efforts made by the numbers of stakeholders for the conservation and sustainable management of the national parks, wild life reserves and the wetlands, there are still wide gaps among the people residing in the surrounding areas of several national natural heritages of Nepal.

People residing in the surrounding areas have developed some form of antagonistic relationship with the national park and wetlands. In this context an initiative directed towards finding ways to improve socioeconomic conditions of people in and around such protected areas and, at the same time, fostering sustainable management of these natural resources would be highly justifiable both from the perspective of bio diversity conservation and economic upliftment of rural people. Addressing these issues properly would require commissioning a comprehensive review study of the nature being proposed here.

Since poverty alleviation issues cannot and should not be addressed in isolation without considering the broader framework of natural resources management, the proposed study would require a holistic approach in looking at its poverty alleviation outcomes from the perspective of natural resources management.

III Objectives of the Study

The overall objectives of this study is to prepare a comprehensive study on the present status of bio diversity in selected national parks and wetlands of economic and conservation importance in Nepal, and to identify feasible areas for JICA-HMG/N cooperation for the participatory and sustainable management of natural resources for the socioeconomic upliftment of people in surrounding areas and bio diversity conservation .

[40] Almost all of the 15 protected areas of Nepal have received some form of donor assistance either through buffer zone management projects or through projects directed towards wild life conservation.

More specific objectives of the present study are as follows:

- Conducting a detail review analysis of what have been done so far by different stakeholders for wild life conservation in protected areas (national parks, wild life reserves, etc.) with focus on priorities, operational modalities and impacts (bio-diversity conservation and socioeconomic upliftment of peoples benefited or affected).
- Identifying alternative with successful modalities for participatory management of protected areas having implications on the management of national parks and wetlands for bio-diversity conservation and socioeconomic upliftment of peoples benefited or affected.
- Carrying out a detail review of studies conducted in the past to identify the areas that are important both from the perspective of bio diversity conservation and socioeconomic upliftment of people surrounding such national parks, wetlands and prioritize them for the interventions of poverty alleviation.
- Conducting a detail baseline survey of priority national parks and wetlands to identify in a comprehensive manner that constraints and potential for the development of identified national parks and wetlands through participatory approach.
- Identifying potential/possible areas for JICA's cooperation for the sustainable development of selected national parks and wetlands through participatory management, elaborate the project ideas thus identified, and recommend for detail project design.

IV Scope of the Study

The present study to a minimum will have to cover the followings:

- Review and analyze the existing and forthcoming policies, program, and legislations related to the national park, wild life and wetlands in Nepal.
- Review and analyze the development programs and institutional mechanism in the national park, wild life and wetlands sub-sector within the forestry sector and their periodic plans, policies and programs.
- Make detail and analytical review of various projects on national parks, wildlife conservation and the wetland management assisted by different donor communities, assess the effectiveness of different modalities adopted in terms of socioeconomic betterment of communities and conservation of bio diversity, and identify major strengths and weaknesses of such modalities in terms of attainment of objectives.
- Identify major constraints and potential for community-based management of national parks and wetlands for socioeconomic betterment of communities and conservation of bio diversity.
- Based on the review analysis, identify promising national parks and wetlands for community-based management for socioeconomic betterment of communities and conservation of bio diversity and prioritize these in terms of urgent need for intervention.
- Conduct detail baseline survey of three priority national parks and three wetland sites covering different aspects (technical, socioeconomic and managerial) and analyze conflict between people and management of the national resources especially the national park, wild life and wetland and assess capacities of local bodies to maintain the judicious/harmonious relationship between the socioeconomic development activities of the communities and the sustainable management of the natural resources specially in national parks, wild life conservation areas and wetlands.
- Based on the review and baseline study carried out, identify possible areas of cooperation between JICA and HMG/N for socioeconomic upliftment of people in and around the national parks and wetlands through community based approach and elaborate project ideas for further development.
- Consult and discuss with the stakeholders including donors and INGO/NGOs from the central level to local level in the whole process of this study.
- To dig out in depth and make detail analysis of the issues related to conflict between people and management of the national resources specially the national park, wild life and wet land.
- To make review and access SABIHA model and learning by the various documents and reports related to project implemented and to explore the possibility to apply to the future cooperation in the sector. In addition, the project CDFWCP phase II (DSCO Kaski and Parbat) could be visited for detail discussion and understanding.

V Methodology to be applied

- The consultant will have made a detail review of documents related to government policies, legislations, plans and programs and projects implemented in the past and those being implemented at present

- The consultants are requested to utilize both the secondary and the primary data related to the field and the objectives of this study.
- In the process of primary data collection, consultants are required to make visit to national park, conservation areas, buffer zones and wetlands and make through interaction with communities residing in these surrounding areas.
- In addition to local communities consultants are also required to interact with the local bodies like VDC, DDC and community based organizations related to the natural resources management.
- Since there could of donors supported projects still in the implementation stages consultant is required to have discussion with these project staff including the MoFSC/DNPWC (field staff), NGOs, and Private sector.

VI Experts required for the study :

These following experts with the respective discipline are required to accomplish this proposed study . The total man months should be 41 at the maximum including assistant level.

- Team Leader/Natural Resource Management
- Ecologist/Biologist
- Community Development Specialist/Institutional experts
- Sociologist (Gender and Equity)
- Socio Economist.

Team Leader/Natural Resource Management:

Team leader with the professional background on natural resources management preferably involved in national park and wetland shall take the lead role on the overall aspects of the study. Since the study is about the national park, wetland and communities, the team leader shall be experienced on how the natural resources are judicious and sustainably managed in harmonies of socioeconomic development of people settled in the surrounding areas.

Ecologist/biologist:

This person will be mainly responsible for the analysis of the ecological and biodiversity of the study areas. As a professional of the wetland and national parks, this person shall be able to trace out the relationship among the wetland, wild life, human settlement and agriculture and their interrelationship among them. Afterwards, s/he should be able to design the how these natural resources could be properly managed/developed.

Community Development Specialist/Institutional expert:

This professional should have experience in analyzing how communities are interdependent towards the wetland, wild life and so on. How the communities are affected positively and negatively by wetland and national parks. What are the various organization/institutions have direct and indirect relation to make harmonious development of communities and national parks and wetland. How the settlement patters affects or the natural resources shall also looked into it. Given this existing situation, this expert shall be recommending the best possible ways of harmonious relation among community, national park, wetland and wildlife including the sustainable institutional mechanism.

Sociologist (Gender and Equity)

The study shall cover the areas of natural as well as the social aspects of the communities residing in the surroundings of the wetland and national parks. Nepalese society with heavy workload on the part of women has significant role but that is not explicitly told or mentioned. How to have harmonious relation between community members and the natural resources could be better understood by person with the expertise on gender and equity. This expert will explore the existing practices of communities, national parks and wetland and come up with the equitable and most sustainable model of gender development with respect of this study.

Socio-economist:

Person with the socioeconomic background shall make proper and coherent relationship between socioeconomic part of the natural resources and the social part of the community. As socio-economist, s/he shall present the overall socioeconomic part of the study.

VII Time Period of the Study :

The total time to accomplish this study will be five months. The detail beak down of the time schedule is attached in the annex 1.

VIII Number of Reports to be submitted:

Total number of reports to be submitted are as follows.
Inception report ten (10) copies.
Interim report ten (10) copies.
First draft report twenty (20) copies.
Final draft report to be submitted twenty (20) copies.

Attachment 2 Table 1: Protected Areas of Nepal

Protected Areas	Area sq km	Physio-graphic regions	Significance
A. National Parks			
1. Royal Chitwan National Park	932	Tarai	World Heritage, tourists destination, famous for Greater One-horned Rhino, Tiger, Bison, *Gharial*, Migratory birds, Elephant and Crocodile Breeding Centres; Ranital, Bishazari Tal, other wetlands, .Narayani and Rapti rivers, Bikram Baba's temple and Valmiki Ashram and other cultural sites, adjoining to PWR, connected with Valmiki Tiger Reserve in India
2. Royal Bardia National Park	968	Tarai	Habitat for threatened species like tiger, sloth bear, swamp deer hispid hare, elephant, dolphin, black buck, mugger, *gharial*; second population of rhinos, Karnali and Babai rivers, Thakurdwara shrine, proposed extension as "Gift to the Earth", key landscape of TAL indirectly linked with Katarniaghat Wildlife Sanctuary in India
3. Khaptad National Park	225	Mid-hills	Unique landscape of rolling plateau with grasslands, encompasses may religious sites, temples and Khaptad lake.
4. Shivapuri National Park[41]	144	Mid-hills	Major watershed providing drinking water to Kathmandu. Rich in bird species and plants. Only walled PA in Nepal. Habitat for relict Himalayan dragonfly, corridor connected to LNP
5. Makalu Barun National Park[42]	1,500	Mountains	Provides ecological support to Mt Everest Ecosystem. Habitat for threatened species of black bear, red panda, musk deer, 25 species of rhododendrons, linked with Qomolongma Nature Preserve in Tibet (China)
6. Shey-Phoksundo National Park	3,555	Mountains	The largest national park in the country, and represents the Trans-Himalayan ecosystem, home to snow leopard and musk deer, Phoksundo lake, locai people inhabit the park, proposed World Heritage Site for its cultural and natural significances.
7. Langtang National Park	1,710	Mountains	The local people inhabit the park. Encompassing an altitudinal range of over 6,450m, distinguished as one of the greatest altitudinal ranges, Famous for Red panda, religious shrines like Gosainkunda, corridor connected with ShNP, linked with Qomolongma Nature Preserve in Tibet (China),
8. Sagarmatha National Park	1,148	Mountains	World Heritage Site, Mount Everest (highest peak 8,848m) and other peaks and glaciers, 10 species of rhododendron, known for musk deer, red panda, Sherpa settlements and monasteries, linked with Qomolongma Nature Preserve in Tibet (China)
9. Rara National Park	106	Mountains	The smallest National Park in the country, established by complete evacuation of local people, known for natural beauty of Rara Lake, Habitat for leopards, red panda, musk deer, Danphe
B. Wildlife and Hunting Reserves			
1. Koshitappu Wildlife Reserve	175	Tarai	Refuge for last remaining population of wild buffalos (below 150), Rich in waterfowls and other

[41] Established in 1976 as a Shivapuri Watershed and Wildlife Reserve, and designated as NP in 2002
[42] Strict Nature Reserve set aside for the scientific study

Protected Areas	Area sq km	Physio-graphic regions	Significance
			birds, Koshi river, First Ramsar site of Nepal.
2. Royal Shuklaphanta Wildlife Reserve	305	Tarai	Extensive grassland (*phanta*) and forest, Mahakali river, largest pool of swamp deer ca 2000, tiger, rhino, elephant, python, monitor lizard, cobra
3. Parsa Wildlife Reserve	499	Tarai	Eastern extension of RCNP, Representative Churia ecosystem. Conservation of *char- kose jhadi* wild elephant and gaur, tiger; Kailash parbat (Shiva temple)
4. Dhorpatan Hunting Reserve	1,325	Mid-hills	The only hunting reserve in the country and renowned for blue sheep (*Pseudois nayaur*)
C. Conservation Areas			
1. Annapurna Conservation Area	7,629	Mountains	Habitat representing Trans-Himalayan and mountain ecosystems, highest and lowest rainfall area, home to snow leopard, musk deer, pheasants; Muktinath and other shrines
2. Kangchenjungha Conservation Area	2,035	Mountains	Habitat for snow leopard, musk deer; rhododendrons, Himalayan larch, some of the world's largest glaciers, opportunity for tri-national peace park linking Qomolongma Nature Preserve in Tibet (China) and Kangchenjungha Biosphere Reserve in Sikkim (India).
3. Manaslu Conservation Area	1,663	Mountains	Habitat for snow leopard, grey wolf, musk deer, blue sheep & Himalayan tahr
D. Buffer Zones			
1. Royal Chitwan NP	750	Tarai	See RCNP
2. Royal Bardia NP	328	Tarai	See RBNP
3. Makalu Barun NP	830	Mountains	See MBNP
4. Langtang NP	420	Mountains	See LNP
5. Shey Phoksundo NP	449	Mountains	See SPNP
6. Sagarmatha NP	275	Mountains	See SNP
Total	26,970		

Source: HMGN/MoFSC, 2002

Attachment 2 Table 2: Major Wetlands in Nepal

Wetlands	Area (ha)		Physio-graphic regions	Significance
	Water body	Watershed		
1. Bishazari tal	180	1,000	Tarai	Large complex of oxbow lakes set in a very scenic environment, a good representative of an oxbow ecosystem, supporting an appreciable assemblage of rare, vulnerable and endangered wildlife species
2. Gaindahawa tal	11	26	Tarai	Oxbow lake, wintering populations of several species of waterfowl
3. Jagadishpur Reservoir	156	406	Tarai	Large irrigation reservoir supporting more than 4% of the Asian population of Ferruginous Duck (*Aythya nyroca*), and designated Ramsar site
4. Badahiya tal	100	100	Tarai	Large marshy natural depression supporting a large number of resident and wintering populations of several species of waterfowl
5. Ghodaghodi tal	150	250	Tarai	Large complex of oxbow lakes set in a very scenic environment, surrounded by dense Sal forest. Designated Ramsar site,
6. Nakhrodi tal	100	130	Tarai	Large complex of oxbow lakes set in a very scenic environment, surrounded by dense *Sal* forest.
7. Rampur tal	22	28	Tarai	Medium-sized complex of oxbow lakes set in a very scenic environment, surrounded by dense Sal forest
8. Deukhuria tal	22	24	Tarai	Large lake set in a very scenic environment. Of major importance as a particularly good example of an oxbow ecosystem supporting an appreciable assemblage of rare Comb duck (*Sarkidiornis melanotos*), vulnerable and endangered wildlife species
9. Patriyani tal	35	200	Tarai	Large oxbow lake
10. Betkot tal	4	4.5		Very scenic lake of special value for maintaining genetic and ecological diversity

Attachment 2 Table 3: International conventions and treaties related to the conservation of biological diversity

SN	Conventions	Date	Nepal's Signature	Main objective	Major obligation
1.	Plant Protection Agreement for the South Asia and Pacific Region (as amended)	27 February 1956	12 August 1965		
2.	Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	2 February 1971	17 December 1987	Prevent of the loss of wetlands	Conservation and sustainable use of migratory stocks of waterfowl
3.	Convention for the Protection of the World Cultural and Natural Heritage (World Heritage Convention)	23 November 1972	20 September 1978	Identify and protect world cultural and natural heritage	Conservation of the designated world heritage site and formulate and implement action plan for the same
4.	Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES)	3 March 1973	16 September 1975	Protect and regulate the trade in wild fauna and flora and their products	Protect all species threatened legally and regulate trade
5.	International Tropical Timber Agreement	18 November 1983	3 July 1990	Conservation sustainable use of tropical forests and protect the indigenous inhabitants	International trade
6.	Agreement on the Network of Aquaculture Centres in Asia and the Pacific	8 January 1988	11 November 1990		
7.	Convention on Biological Diversity	5 June 1992	15 June 1992	Ensure conservation and sustainable use of biological resources, and fair and equitable sharing of benefits	Prepare and implement strategies for the conservation of biodiversity
8.	UN Framework Convention on Climate Change; Kyoto Protocol 1997	1992	31 July 1994	Regulate greenhouse emissions	Formulation of national policies and corresponding measures
9.	UN Convention to Combat Desertification	17 June 1994	13 January 1997	Implement activities that help to combat desertification and mitigate the effects of the drought	Adopt integrated approach to improve the productivity of land systems Integration of strategies for poverty eradication and implementation of National Action Plan
10.	Global Tiger Forum	2002	2002	Range state to initiative to protect tiger in the region	Protect tiger and its habitat

Attachment 2 Table 4 List of wildlife species that are permitted for commercial farming

Protected Wild Animal Species	Other Wild Animal Species
a. *Gharial* Crocodile (*Gavialis gangeticus)* b. Black Buck (*Antelope cervicarpa)* c. *Danphe* (*Lophophorus impejanus*) d. *Monal* (*Tragopan satyra*) e. Cheer pheasant (*Catreus wallichii)*	a. Barking deer (*Muntiacus muntjak)* b. Spotted deer (*Axis axis*) c. *Samber* deer (*Cervus mulata*) d. Rhesus monkey (*Macaca mulata*) e. Hog deer (*Axis porcinus*) f. Wild boar (*Sus scrafa*) g. Snakes h. All kinds of birds

Attachment 2 Table 5 Protected Species (Appendix I of NPWC Act, 1973)

Common name	Scientific name	Status	
Mammals:		IUCN	CITES
Assamese monkey	*Macaca assamensis*		II
Pangolin (Chinese)	*Manis pentadactyla*		II
Pangolin (Indian)	*Manis crassicaudata*		II
Hispid hare	*Caprolagus hispidus*	E	I
Gangetic dolphin	*Platanista gangetica*	V	I
Tibetan wolf	*Canis lupus*	V	I
Brown bear	*Ursus artos*		I
Red panda	*Ailurus fulgens*		I
Spotted linsang	*Prionodon pardicolor*		I
Stripped hyena	*Hyaena hyaena*	E	I
Leopard cat	*Prionailurus bengalensis*		II
Lynx	*Felix lynx*	E	II
Clouded leopard	*Pardofelis nebulosa*	V	I
Tiger	*Panthera tigris*	E	I
Snow leopard	*Uncia uncia*	E	I
Asiatic elephant	*Elephas maximus*	E	I
One-horned rhinoceros	*Rhinoceros unicornis*	E	I
Pigmy hog	*Sus salvanius*	Ex (?)	I
Musk deer	*Moschus chrysogaster*	E	I
Swamp deer	*Cervus duvauceli*	E	I
Gaur	*Bos gaurus*	V	I
Wild yak	*Bos mutus*	E	I
Wild buffalo	*Bubalus arnee*	E	III
Great Tibetan sheep	*Ovis ammon*	I	I
Tibetan antelope	*Pantholops hodsoni*		I
Blackbuck	*Antelope cervicarpa*	V	III
Four horned antelope	*Tetracerus quadricornis*		III
Birds			
Black stork	*Ciconia nigra*		II
White stork	*Ciconia ciconia*		II
Sarus crane	*Grus grus*		
Impeyan pheasant	*Lophophorus impejanus*		I
Cheer pheasant	*Catreus wallichii*	E	I
Satyr tragopan	*Tragopan satyra*		III
Bengal florican	*Houbaropsis bengalensis*	E	I
Lesser florican	*Sypheotides indica*		II
Giant hornbill	*Buceros bicornis*		I
Reptiles			
Python	*Python molurus*	V	I
Gharial crocodile	*Gavialis gangeticus*	E	I
Golden monitor lizard	*Varanus flavescen*	I	I

Source: NPWC Act, 1973
CITES Codes: Appendices I, II, III
IUCN Categories: Ex=Extinct; E=Endangered; I=Indeterminate; V=Vulnerable

Attachment 2 Table 6: Major Biodiversity Sector Projects by Protected Areas

Protected Areas	Current Projects	Funding Agencies/ Donors	Implementation Period	Conservation Approach
RCNP	1. PCP	UNDP	2002-2004	Community based buffer zone management model
	2. TRCP	KMTNC/ GEF/ UNF, UNDP	2001-2003	Species Conservation
	3. Anti Poaching	WWF	1991-onwards	Species Conservation
	5. TAL	WWF	2003-2007	Landscape Approach
	6. BCP	KMTNC/ NORAD	1996-2007	ICDP
	7. Rhino Translocation	WWF/ KMTNC	1986 onwards	Species conservation
LNP	1. TRPAP	UNDP/SNV/DFID	2001-2006	Community based management model
SNP	SCAFP	WWF	July 1, 2002- June 30, 2003	ICDP
	Buffer Zone Programme	HMG/N (Revenue generated by the Park)	Continued	Community based buffer zone management model
	TRPAP	UNDP/ DFID/SNV	2001-2006	Community Based Tourism Program
RNP	PCP	UNDP	2002-2004	Community based buffer zone management model
SPNP	NMCP	WWF	1996 onwards	ICDP
	TRPAP	UNDP/ DFID/SNV	2001-2006	Community Based Tourism Program
KNP	PCP	UNDP	2002-2004	Community based buffer zone management model
RBNP	BCP	KMTNC/ NORAD	1996-2007	ICDP
	PCP	UNDP	2002-2004	Community based buffer zone management model
	Anti Poaching	WWF	1991-onwards	Species Conservation
	BZDP	CARE	2001-2004	Community based buffer zone management model
	TAL	WWF	2003-2007	Landscape Approach
	Rhino Translocation	WWF/KMTNC	1986 onwards	Species conservation
ShNP	None			
RSWR	Anti Poaching	WWF	1991-onwards	Species Conservation
	BCP	KMTNC	1996-2007	ICDP
	PCP	UNDP	2002-2004	Community based buffer zone management model
	TAL	WWF	2003-2007	Landscape Approach
	Rhino Translocation	WWF/ KMTNC	1986 onwards	Species conservation
KWR	PCP	UNDP	2002-2004	Community based buffer zone management model
PWR	PCP	UNDP	2002-2004	Community based buffer zone management model
	Anti Poaching	WWF	1991-onwards	Species Conservation

Protected Areas	Current Projects	Funding Agencies/ Donors	Implementation Period	Conservation Approach
	TAL	WWF	2003-2007	Landscape Approach
DHR	NMCP	WWF	1996 onwards	ICDP
ACA	ACAP	KMTNC	1992- 2012	ICDP
	UMBCP	UNDP/GEF/AHF/ ICIMOD/ KMTNC	2001-2005	Ecosystem approach/ ICDP
KCA	KACP	WWF	1998 onwards	ICDP
	TRPAP	UNDP/ DFID/SNV	2001-2006	Community Based Tourism Program
MCA	MEDP	KMTNC/ ADB	1997 onwards	ICDP

Attachment 3 Table1: Criteria used in prioritizing Protected Areas

Criteria	Indicators	Variables	Decision rule
• Biodiversity significance	• Species diversity • Habitat diversity • Area	• Number of floral and faunal species per unit area of PA • Number of ecosystem types • Area in sq km	• Select those sites that are rich in biodiversity and larger in area
• Conservation significance	• Protection of endemic plant • Protection of endangered species	• Number of endemic flowering plants • Number of endangered wildlife species	• Select those sites with more number of endemic flowering plants and endangered species
• Poverty significance	• Relative level of poverty in PA located districts	• Average PDI rank of district where PA is located	• Select those sites that are situated in districts ranked high in poverty
• Socioeconomic significance	• Socioeconomic opportunities • Religious value	• Number of tourists visiting • Dependent population • Revenue generated • Number of religious sites • Number of pilgrims	• Select those sites with high socioeconomic and religious significance
• Conflict significance	• Level of threats	• Number of threatening activities	• Select those sites that have higher threat levels
• Programme significance	• Development assistance	• Budget allocated • Presence of donor support	• Select those sites with low development assistance
• Partnership significance	• Partnering possibilities	• Possibilities to replicate SABIHAA model • Status of donors support	• Select those sites that have high chance of replicating SABIHAA and partnering with donors
• Global significance	• International importance	• Relevancy of various international conventions/agreements • Trans-boundary value	• Select those sites with high international commitments pertinent to global significance

Attachment 3 Table 2: Criteria Used in Prioritizing Wetland Sites

Criteria	Indicators	Variables	Decision rule
• Biodiversity significance	• Species diversity • Habitat diversity • Area of wetland	• Species diversity rating done by BPP • Number of habitat type • Area in ha	• Select those sites that are rich in species indicated by high score, more number of habitat types and larger wetland area
• Conservation significance	• Present condition of wetland	• Local perception on the present condition rated as excellent, high, average, fair and poor	• Select those sites that are not in good condition
• Poverty significance	• Relative level of poverty in WS located district	• PDI rank of district where wetland is located	• Select those sites that are situated in districts ranked high in poverty
• Socioeconomic significance	• Extent of community dependence	• Plant production / collection • Animal production / harvesting • Water storage or supply • Tourism/recreational value • Land development	• Select those sites where community dependence is high
• Conflict significance	• Level of threats	• Number of threatening activities	• Select those site that have higher level of threats
• Partnership significance	• Partnership possibilities	• Existence or otherwise of conservation effort • Existence or otherwise of conservation plans • Presence or otherwise of donors	• Select those sites that have high chance of partnering with local bodies and donors
• Global significance	• International importance	• Declaration or otherwise of Ramsar site • Cited in other international documents	• Select those sites with high international commitments pertinent to global significance

Attachment 4 Table 1: Summary HH data of studied PAs

Parameters	Unit	KWR		ShNP		LNP	
		User	Non user	User	Non user	User	Non user
Number of HH surveyed	No	50	10	50	60	50	10
Classification by economic status*							
Landless	%	34		10.0		18.0	
Small farmer	%	44		72.0		44.0	
Large farmer	%	22		19.0		36.0	
Ethnicity**							
BCN**	%	18.3		23.3		36.7	
Occupational**	%	35		10.0		13.3	
Ethnic**	%	46.7		66.7		50.0	
HH size	No	7.78	5.8	7.3	5.3	5.6	6.2
Landless*	No	5		8.0		4.6	
Small farmer*	No	8.5		7.9		5.3	
Large farmer*	%	10.7		5.5		6.5	
Literacy							
Male	%	60.0	48.6	71.3	55.0	77.0	75.2
Female	%	35.9	50.0	55.0	37.3	52.2	54.3
Occupation							
Male							
Student	%	19.8	11.1	33.3	25.0	37.6	23.3
Agriculture	%	27.6	33.3	33.3	25.0	34.0	13.3
Wage	%	31.0	38.9	18.0	37.5	6.4	23.3
Service	%	4.3	5.6	8.0	6.3	7.1	3.3
Business	%	9.5	5.6	4.7	-	12.8	16.7
Fishing	%	6.0	-	-	-	-	10.0
Others	%	1.7	5.6	2.7	6.3	2.1	10.0
Female							
Student	%	29.8	42.9	36.2	31.3	21.7	18.5
Agriculture	%	32.7	21.4	47.5	43.8	50.9	25.9
Wage	%	23.1	28.6	10.6	18.8	8.5	25.9
Service	%	-	7.1	2.8	-	0.9	-
Business	%	14.4	-	2.1	6.3	17.0	25.9
Others	%			0.7	-	0.9	3.7
Access to land	%	66	70	90.0	90.0	82.0	70.0
Operated land size	ha	0.87	1.45	0.52	0.13	0.56	0.18
Landless*	ha	0		-		-	
Small farmer*	ha	0.29		0.3		0.3	
Large farmer*	ha	2.03		1.5		1.0	
BCN**	ha	1.32		0.3		0.4	
Occupational**	ha	0.58		0.3		0.1	
Ethnic**	ha	1.03		0.6		0.6	
HH with Livestock	%	71	62.5	90.0	90.0	75	50
Cow	%	58	50	32.0	40.0	46	30
Ox	%	42	60	10.0	10.0	26	20
Buffalo	%	18	0	52.0	40.0	42	40
Sheep	%	2	0	76.0	90.0	6	0
Goat	%	36	10	50.0	30.0	44	40
Livestock worth	Rs	19,143	17,563	42,643	26,175	51,348	48,183
Own houses	%	100	100	98.0	100	98	90
Average house value	Rs	13,773	18,302	232,157	7,300	232,854	168,889
Asset value	Rs	22,962	9,865	92,858	12,788	22,966	2,170
HH using different energy							

Parameters	Unit	KWR		ShNP		LNP	
		User	Non user	User	Non user	User	Non user
Fuel wood	%	72	90	90.0	90.0	92	90
Kerosene	%	32	30	52.0	20.0	90	80
Electricity	%	4	10	12.0	20.0	64	60
LP gas	%	2	0	6.0	10.0	8	10
Cow dung cake	%	44	40	-	-		
Crop residue	%	12	0				
Brushwood	%	4	0	6.0	20.0		
Source of forest products							
Buy	%	3.8	14.3	-	4.9	8.2	-
Buffer zone forest	%	1.3	-			3.1	4.8
Community forest	%	17.9	42.9	35.7	11.1	31.6	4.8
National forest	%	2.6	-	-	1.2	5.1	-
National park	%	44.9	35.7	57.1	43.2	32.7	76.2
Own source	%	9.0	7.1	7.1	33.3	19.4	9.5
Private forest	%	-	-	-	6.2		
Wetland	%	20.5	-				
Others						-	4.8
Dependency on other forest product							
Fuel wood	%	66	90	80.0	80	84	70
Fodder	%	14	10	40.0	30	50	60
Timber	%	2	10	-	0	24	30
Thatch	%	46	30	-	0	0	0
Litter	%	2	0	18.0	20	20	40
drift wood	%	10	0				
Livestock grazing							
Common land	%	13.9	16.7	13.7	13.3	14.4	18.8
Free grazing	%	31.9	33.3	8.2	13.3	19.2	12.5
National forest	%	1.4		4.1	13.3	9.6	12.5
Stall feed	%	30.6	50.0	50.7	46.7	22.1	18.8
National park		9.7		2.7	6.7	9.6	15.6
Community forest	%	1.4		4.0		6.7	6.3
Individual land	%	2.8		15.1	6.7	12.5	6.3
BZ Area	%	6.9				5.8	9.4
Energy saving device							
Improved Cooking Stove	%			2.0			0
Solar Cooker	%			-			
Risk Husk Stove	%	4	10	22.0	10	2	0
Other Energy Saving Device	%	6	10	4.0	10	4	0
HH access to training	%	89.8	10.2	93.2	7.7	84	16
Male	%	100.0	-	85.7	14.4	70	30
Female	%	84.8	15.2	93.8	6.2	93.3	6.7
Training subject areas		Male	Female	Male	Female	Male	Female
Skill development	%	25.0	37.5	14.3	25.0	20.0	53.3
Income generating	%		6.3	28.6	12.5	30.0	33.3
Office management	%	25.0	18.8	-	3.1	10.0	-
Biodiversity conservation	%	6.3	18.8	-	9.4	-	6.7
Enterprise development	%	6.3	6.3	-	-	40.0	-
Gender and equity	%	6.3		14.3	3.1	-	-
Leadership development	%	31.3	6.3	-	-	-	-
Forest management	%			42.9	46.9	-	
Others			6.3				
Membership in local organization		UG	NUG	UG	NUG	UG	NUG
Male	%	100	0	100.0	-	88	12

Parameters	Unit	KWR		ShNP		LNP	
		User	Non user	User	Non user	User	Non user
Female	%	100	0	94.4	5.6	100	0
BCN**	%	15.0		15.8		41.0	
Occupational**	%	28.3		21.1		7.7	
Ethnic**	%	56.7		63.2		53.3	
Decision making position							
Male	%	100	0	100.0	-	90	10
Female	%	100	0	93.1	6.9	100	0
Chair	%	4.5	14.3	20.0	10.3	10.0	8.3
Vice chair	%					-	8.3
Secretary	%	9.1	2.0	20.0	6.9	-	25
Treasurer	%		28.6		3.4	-	
Member	%	86.4	35.7	60.0	79.3	90.0	58.4
Discrimination on benefit sharing	%	12	0	-	0	14	10
Average HH income	Rs	30,574	20,100	56,207	35,057	38,830	34,625
Share of income							
Agriculture	%	42.6	14.9	27.0	9.0	25.9	32.1
Non agriculture	%	57.2	84.6	71.3	91.0	49.1	41.9
Forest product	%	-	0.5	0.7	-	21.8	-
Tourism	%	0.2		0.7	-	0.3	26.0
Pensions	%			-	-	2.8	-
Wetland	%			-	-	-	-
Other	%			0.2	-	-	-
Purpose of visit							
Collection of Forest Products		17.6		50.0	55.6	41.6	27.3
Grazing		12.1		3.3	11.1	15.6	18.2
Recreation		7.7	20.0	10.0	22.2	20.8	18.2
Religious		1.1		6.7		9.1	18.2
Meet officials		1.1		1.7		5.2	
Trespassing/ road		4.4	20	20.0	11.1	2.6	
Driftwood collection		3.3	10.0			0	0
Fishing		6.6	10			0	0
Sand, stone collection				5.0		3.9	4.5
Thatch collection		39.6	40.0			0	
Others		6.6		3.3			
Conflicts							
Threats or causality o human life		16	10	10.0	0	8	30
Incidence reported	No	10	1	1.0	0	6	5
Crop raiding problems		62	50	60.0	80	58	60
Incidence reported	No	47	5	47.0	11	52	11
Livestock depredation		0	20	30.0	30	18	30
Incidence reported	No	0	3	16.0	3	12	3
Awareness about mitigation measures		30	70	52.0	30.0	16	30
Caught by management authorities		6	10	10	0	12	10
Aware of policies		34	20	52	50	48	50
Relationship with management authority							
Good		38	30	44.0	40.0	78	75
Average		36	40	36.0	50.0	8	8.3
Poor		14				6	6.7
No relation		12	30	20.0	10.0	8	10
Approach to management authority							

Parameters	Unit	KWR		ShNP		LNP	
		User	Non user	User	Non user	User	Non user
Never		48	50	88.0	90.0	88	100
Rare		2	20	8.0	1.0	8	0
Often		38	30	4.0		4	0
Always		12	0	-			0
Impact of programs on livelihood							
Yes		16.0		36	40	18	18
No		2.0					
No idea		82.0	100.0	74	60	82	40

Remark

* Collated for UG HH only

** Collated for all respondent

	KWR			ShNP			LNP		
	Land less	Small	Large	Land less	Small	Large	Land less	Small	Large
Equity concerns by economic status									
Representation in user groups	25.7	45.7	28.6	8.8	71.9	15.8	7.7	48.7	35.9
Decision making position in UGs	16.7	44.4	38.9	5.1	66.7	23.1	12.5	40.6	40.6
Discrimination in Benefits	0	18.2	18.2	0	- 0	0	0	13.6	21.1
Access to training	6.1	49	34.7	2.6	69.2	20.5	28	28	28
Energy saving device	-	13.6	9.1	20.0	36.1	11.1	-	9.1	5.3

	KWR			ShNP			LNP		
	BCN	Occu	Ethnic	BCN	Occu	Ethnic	BCN	Occu	Ethnic
Equity concerns by social status									
Representation in user groups	15	28.3	56.7	15.8	21.1	63.2	41	7.7	51.3
Decision making position in UGs	13.9	13.9	72.2	7.7	15.4	76.9	34.4	3.1	62.5
Discrimination in Benefits	9.1	9.5	10.7	0	0	0	13.6	12.5	13.3
Access to training	6.1	49	34.7	15.4	7.7	76.9	28	8	64
Energy saving device	-	14.3	3.6	14.3	50.0	27.5	-	-	10.0

Note: Occu: Occupational Caste group

Attachment 4 Table 2: Summary HH data of studied WSs

Parameters	Unit	BTRS		JRRS		GTRS	
		User	Non user	User	Non user	User	Non user
Number of HH surveyed	No	50	10	50	10	50	10
Classification by economic status*							
Landless	%	8.0		20.0		34	
Small farmer	%	26.0		44.0		44	
Large farmer	%	66.0		36.0		22	
Ethnicity**							
BCN**	%	50		40.0		53.4	
Occupational**	%	18.3		21.7		13.3	
Ethnic**	%	31.7		38.3		33.3	
HH size	No	6.9	5.9	7.4	8.3	7.1	5.9
Landless*	No	5.8		14.5		3.3	
Small farmer*	No	6.3		5.0		9.5	
Large farmer*	%	8.6		11.3		8.2	
Literacy							
Male	%	75.8	63.0	61.3	83.9	64.6	54.5
Female	%	65.5	61.5	36.7	32.4	35.0	31.6
Occupation							
Male							
Student	%	34.1	16.0	27.9	15.7	35.1	33.7
Agriculture	%	45.3	48.0	51.4	68.6	50.7	62.4
Wage	%	2.4	20.0	10.9	9.8	9.5	2.0
Service	%	8.8	-	4.4	3.9	2.0	2.0
Business	%	8.8	8.0	2.7	2.0	1.4	-
Fishing	%	-	-	0.5	-	0.7	-
Others	%	0.6	8.0	2.2	-	0.7	-
Female							
Student	%	35.7	36.4	28.5	20.5	36.7	25.0
Agriculture	%	48.1	27.3	63.1	66.7	53.3	62.5
Wage	%	1.6	18.2	8.5	12.8	-	-
Service	%	6.2	-	-	-	3.3	6.3
Business	%	8.5	13.6	-	-	6.7	6.3
Fishing	%	-	-	-	-	-	-
Others	%	-	4.5	-	-	-	-
Access to land	%	92	90	80.0	90.0	86.0	-
Operated land size		0.71	0.35	1.7	3.34	1.11	0.36
Landless*	ha	0	0	-	-		0
Small farmer*	ha	0.40		0.4		0.5	
Large farmer*	ha	1.51		3.4		3.1	
BCN**	ha	0.72		2.4		0.7	
Occupational**	ha	0.21		1.2		0.5	
Ethnic**	ha	0.83		1.7		1.4	
HH with Livestock	%	88	80	84.0	80.0	86	100
Cow	%	38	40	38.0	10.0	58	70
Ox	%	10	10	68.0	60.0	80	58
Buffalo	%	66	60	16.0	8.0	52	40
Sheep	%	20	0			10	10
Goat	%	50	30	30.0	40.0	36	60
Average worth of livestock	Rs	10,172	7,378	6,664.9	7,600	7,134	4,663
Own houses	%	98	80	100.0	100	98	100
Average house value	Rs	283,454	81,278	232,143	241,318	34,539	20,636
Asset value	Rs	596,163	44,509	309,227.4	22,480	421,662	14118.75

Parameters	Unit	BTRS		JRRS		GTRS	
		User	Non user	User	Non user	User	Non user
HH using different energy							
Fuel wood	%	86	90	76.0	100.0	82	90
Kerosene	%	12		56.0	60.0	80	80
Electricity	%	7.7	10	12.0	20.0	0	0
LP gas	%	42	40			0	0
Cow dung cake	%	4	0	58.0	30.0	12	0
Brushwood	%	10	0	10.0	10.0	0	0
Source of forest products							
Buy	%	5.4	7.7	11.9	12.5	1.5	
Buffer zone forest	%	8.7	0.0				
Community forest	%	58.7	46.2	23.8	12.5	81.8	70
National forest	%	9.8	15.4	38.1	25.0	10.6	30
National park	%	5.4	15.4				
Own source	%	6.5	7.7	9.5	37.5	6.1	
Private forest	%	4.3	7.7	7.1	-	0	
Wetland	%	1.1	0.0	9.5	12.5	0	
Dependency on other forest product							
Fuel wood	%	74	80	60.0	80	78	80
Fodder	%	38	40	10.0	0	32	60
Timber	%	2	10	2.0	0	0	0
Thatch	%	18	20	18.0	20	8	10
Litter	%	4	10			2	0
drift wood	%	2					
NTFPs	%						
Livestock grazing							
Common land	%	4.3	9.1	10.6	28.6	16.7	14.3
Free grazing	%	17.4	18.2	19.7	14.3	15.3	19.0
National forest	%	13.0	9.1	1.5	7.1	4.2	4.8
Stall feed	%	65.2	63.6	57.6	50.0	52.8	42.9
Community forest	%			3.0	-	6.9	9.5
Individual land	%			7.6	-	4.2	9.5
Energy saving device							
Improved Cooking Stove	%	8	10	2.0			
Solar Cooker	%	4	0	2.0			
Risk Husk Stove	%	12	10	4.0		2	2
Other Energy Saving Device	%	2	10				
HH access to training	%	88.3	11.7	84.4	15.6	84.4	15.9
Male	%	92.6	7.4	80	20	88.9	11.1
Female	%	84.8	15.2	86.4	13.6	80.8	19.2
Training subject areas		Male	Female	Male	Female	Male	Female
Skill development	%	22.2	27.3	30.0	40.9	33.3	42.3
Income generating	%	11.1	21.2	20.0	18.2	33.3	30.8
Office management	%	22.2	12.1	30.0	4.5	11.1	3.8
Biodiversity conservation	%	14.8	3.0	-	-	-	-
Enterprise development	%	14.8	6.1	10.0	-	22.2	15.4
Gender and equity	%	3.7	6.1	-	9.1	-	-
Leadership development	%	7.4	18.2	10.0	-	-	-
Others	%	3.7	6.1	-		-	7.7
Membership in local organization		UG	NUG	UG	NUG	UG	NUG
Male	%	94.6	5.4	78.1	21.9	100	0

Parameters	Unit	BTRS		JRRS		GTRS	
		User	Non user	User	Non user	User	Non user
Female	%	97.8	2.2	100.0	0	100	0
BCN**	%	69.7		44.2		51.2	
Occupational**	%	15.1		11.6		9.8	
Ethnic**	%	15.1		44.2		39.0	
Decision making position							
Male	%	100	0	80.0	20.0	100	0
Female	%	100	0	50.0	50.0	100	0
Chair	%	21.1		15.0	33.3	18.2	
Vice chair	%			15.0	16.7	4.5	
Secretary	%	73.7	28.6	5.0	-	4.5	
Vice secretary	%					4.5	
Treasurer	%			10.0	-	4.5	
Member	%	5.3	71.4	55.0	50.0	63.6	
Discrimination on benefit sharing	%	6	30	6.0	0	8	10
Average HH income	Rs	137,721	174,250	60,368.0	27,000	16,905.7	20,687.5
Share of income							
Agriculture	%	10.8	7.2	28.4	43.5	35.5	66.2
Non agriculture	%	76.5	78.9	65.1	56.5	64.3	33.8
Forest product	%	0.06	-	-	-	-	-
Tourism	%	1.8	12.5	-	-	-	-
Pensions	%	0.9	-	5.4	-	-	-
Wetland	%	-	-	-	-	-	-
Other	%	10.0	1.4	1.1	-	0.2	-
Purpose of visit							
Collection of Forest Products		14.6				16.5	15.4
Grazing		-	11.1	2.2	0	2.1	3.8
Recreation		73.2	77.8	53.3	62.5	34.0	34.6
Religious		2.4	11.1	8.9	0	27.8	26.9
Meet officials				2.2	0	7.2	-
Trespassing/road		7.3		26.7	37.5	-	-
Irrigation		24.4	33.3	4.4	0	-	-
Fishing		2.4				4.1	7.7
Sand, stone collection						2.1	-
Thatch collection		2.4	11.1			6.2	11.5
Others				2.2	0	-	-
Threats or causality o human life		12	20	-	0	0	0
Incidence reported	No	6	3	-	0	0	0
Crop raiding problems		68	60	12.0	20	66	70
Incidence reported	No	54	10	6.0	1	48	12
Livestock depredation		22	20	-	0	20	12
Incidence reported	No	12	3	-	0	38	8
Awareness about mitigation measures		58	70	2.0	10.0	8	40
Caught by management authorities		8	0	4	10	10	10
Aware of policies		16	0	16	10	32	50
Relationship with management authority							
Good		28	20	22.0	30.0	40	33
Average		30	40	24.0	10.0	32	33
Poor		16	20	2.0	10.0	0	
No relation		26	20	52.0	0.0	28	33

Parameters	Unit	BTRS		JRRS		GTRS	
		User	Non user	User	Non user	User	Non user
Approach to management authority							
Never		70	70	98.0	100.0	84	50
Rare		8	10			10	20
Often		10				4	30
Always		12	20	2.0		2	10
Impact of programs on livelihood							
Yes		26.0		52	60	28	40
No		24.0	10.0				
No idea		50.0	90.0	48	40	72	60

Remark

** Collated for all respondent

* Collated for UG HH only

	BTRS			JRRS			GTRS		
	Land less	Small	Large	Land less	Small	Large	Land less	Small	Large
Equity concerns by economic status									
Representation in user groups	6.7	67.2	21.8	16.3	25.6	41.9	8.3	45	46.7
Decision making position in UGs	0	76.9	23.1	11.5	23.1	38.5	16.1	54.8	29
Discrimination in Benefits	0	3	15.4	0	0	16.7	14.3	3	20
Access to training	1.7	51.7	25	12.5	56.3	15.6	9.1	56.8	18.2
Energy saving device	75.0	9.1	30.8	0	22.7	16.7	42.9	3.0	

	BTRS			JRRS			GTRS		
	BCN	Occu	Ethnic	BCN	Occu	Ethnic	BCN	Occu	Ethnic
Equity concerns by social status									
Representation in user groups	69.7	15.1	15.1	44.2	11.6	44.2	51.2	9.8	39
Decision making position in UGs	73.1	19.2	7.7	34.6	11.5	53.8	41.9	12.9	45.2
Discrimination in Benefits	6.7	18.2	10.5	8.3	7.7		6.3	12.5	10
Access to training	55	33.3	11.7	40.6	9.4	54.5	50	13.6	36.4
Energy saving device	3.3	45.5	36.8	16.7	7.7	30.8	0	14.3	0

Note: Occu: Occupational Caste group