UNESCO – IUCN Enhancing Our Heritage Project :
Monitoring and Managing for Success in Natural World Heritage Sites

Initial Management Effectiveness Evaluation Report :
Royal Chitwan National Park, Nepal, August 2003

UNESCO

PATRIMONIO MUNDIAL · WORLD HERITAGE · PATRIMOINE MONDIAL

IUCN
The World Conservation Union

UNITED NATIONS FOUNDATION

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ACRONYMS

APU	Anti Poaching Unit
BCC	Biodiversity Conservation Center
BPP	Biodiversity Profiles Project
BSU	Buffer Zone Support Unit
BZ	Buffer Zone
BZDC	Buffer Zone Development Committee
CBO	Community Based Organization
CF	Community Forest
CITES	Convention on International Trade in Endangered Species of Wild Fauna & Flora
CW	Chief Warden
DDC	District Development Committee
DFO	District Forest Office
DG	Director General
DNPWC	Department of National Parks and Wildlife Conservation
DOF	Department of Forest
EIA	Environmental Impact Assessment
FO	Functional Organization
FUC	Forest Users Committee
FUG	Forest Users Group
GIS	Geographic Information System
GPS	Global Positioning System
HAN	Hotel Association of Nepal
HMG/N	His Majesty's Government, Nepal
ICDP	Integrated Conservation and Development Program
INGO	International Non Governmental Organization
IOF	Institute of Forestry
ITNC	International Trust for Nature Conservation
IUCN	International Union for the Conservation of Nature and Natural Resources
KMTNC	King Mahendra Trust for Nature Conservation
M&E	Monitoring and Evaluation

MOFSC	Ministry of Forests and Soil Conservation
MPTS	Multi Purpose Tree Species
NBAP	National Biodiversity Action Plan
NGO	Non Governmental Organization
NP	National Park
NPWC	National Parks and Wildlife Conservation
NRs	Nepali Rupees
NTB	Nepal Tourism Board
NTFP	Non-timber Forest Product
PA	Protected Area
PCP	Participatory Conservation Program
PPP	Park People Program
RCNP	Royal Chitwan National Park
TAL	Terai Arc Landscape
UC	Users Committee
UG	Users Group
UNDP	United Nations Development Program
UNESCO	United Nations Educational Scientific and Cultural Organization
VDC	Village Development Committee
WR	Wildlife Reserve
WII	Wildlife Institute of India
WWF	World Wildlife Fund
ZSL	Zoological Society of London

FACT SHEET OF RCNP AND BUFFER ZONE

Location:	Southern Part of Central Nepal	
National Park Gazetted year:	1973	
World Heritage Site Accreditation year: 1984		
IUCN Category:	II	
National Park Area:	1182 sq km	
National Park Boundary:	X1: 83.8779	Y1: 27.3423
	X2: 84.7430	Y2: 27.6898
Buffer zone designation year:	1997	
Buffer zone Area:	766 sq km	
Buffer zone boundary:	X1: 83.8398	Y1: 27.2823
	X2: 84.7738	Y2: 27.7038
Buffer zone population:	223,260 distributed over parts of	
	2 Municipality and 35 VDCs	
Major geophysical character:	Doon (Bhitri Madesh) and Siwalik	
Major Ethnic groups:	Tharu, Bote-Majhi, Mushar, Brahmin, Chettri, Newar, Gurung, Tamang, Magar, Damai, Kami and Sarki	
Major River:	Narayani, Rapti and Reu	
Bioclimatic zone:	Tropical and Sub-tropical	
Biogeographic Realm:	Indo-Malayan	
Climate:	Tropical Monsoon with high humidity	
Mean annual rainfall range:	2000 - 2100 mm	
Average air temperature:	Minimum 17.4^0 C and Maximum 31^0 C	
Elevation Range:	110 - 850 meters from m.s.l.	

Endangered species:	Mammals:	Asian one-horned rhinoceros, Asiatic elephant, Bengal tiger, Gaur, Four horned antelope, Gangetic dolphin, Spotted linsang, Pangolin, Hyaena and Sloth bear
	Birds:	Giant hornbill, Black stork, White stork, Common crane, Bengal florican and Lesser florican
	Reptiles:	Asiatic rock python, Gharial and Yellow monitor lizard
	Amphibians:	Maskey's frog
	Plants:	Tree fern, Cycas, Screw pine
Known locally extinct species:		Swamp deer and Wild water buffalo
Major Vegetation Types:		Sal forest, Tropical Mixed Hardwood forest
		Khair-sissoo Riveraine forest and Grasslands
Annual Visitors (Approximately):		105, 461 (in 1998/99)
Approach Roads:		Bharatpur - Kasara: 22 km
		Bharatpur - Sauraha: 17 km
Major Issues of Concern:		Habitat quality deteriorating
		High pressure on the park resources
		Inadequate alternative livelihood and resources
		Haphazard tourism enterprise growth
		Inadequate coordination
		Insufficient financial resources

PROJECT BACKGROUND

Enhancing Our Heritage: Managing and Monitoring for Success in Natural World Heritage Site is an UNESCO – IUCN Project funded by the United Nations Foundation. The four year project (2001-2004) is being implemented in 10 world heritage sites located in Africa, South Asia and Latin America. The three project sites in South Asia are Keoladeo National Park, Kaziranga National Park, India and Royal Chitwan National Park, Nepal. The Wildlife Institute of India, Dehradun, has been selected as a Regional Partner Institute to provide technical backstopping for project implementation in South Asia.

The principle objectives of the project are to promote the development of monitoring and evaluation system and facilitate adaptive management. Based on lessons learnt, the project aims to enhance the periodic reporting process for the World Heritage Site.

An initial management effectiveness evaluation as per the project methodology has been carried out in Royal Chitwan National Park in the year 2002-03 and the findings and recommendations are presented in the report. Along with this, a video capsule on the park profile and management effectiveness evaluation has also been prepared as part of project activities in Royal Chitwan National Park, Nepal.

1.0 INTRODUCTION

The Royal Chitwan National Park (RCNP) was established in 1973 as a first National Park of Nepal. It is world renowned for its unique diversity of flora and fauna and outstanding natural features. It is meant for protecting the habitats of many endangered wildlife and the rich wealth of the Churia, and inner Terai valley ecosystems. UNESCO designated RCNP as a World Heritage Site in November 1984 under the World Heritage Convention recognizing its unique biological resources.

The biological richness of the park is outstanding with 8 ecosystem types which include 7 forest types, 6 grassland types, 5 wetland and 3 main river system habitats. The faunal diversity consists of 50 species of mammals, 526 species of birds, 49 species of reptiles and amphibians, and 120 fish species. The floral diversity of the park consists of more than 600 plant species which include 3 gymnosperm, 13 pteridophytes, 415 dicotyledons, 137 monocot, 16 species of orchids. The park harbors the rare tree fern (*Cyathea spinosa)*, cycas *(Cycas pectinata*), screw pine (*Pandanus furcatus)* and many endangered animals such as Asian one-horned rhinoceros (*Rhinoceros unicornis*), Asiatic elephant (*Elephas maximus*), Bengal tiger (*Panthera tigris tigris*), gaur (*Bos guarus*), gangetic dolphin (*Platanista gangetica*), giant hornbill (*Buceros bicornis*), Bengal florican (*Houbaropsis bengalensis*), and Gharial (*Gavialis gangeticus*).

RCNP is bordered to the east by Parsa Wildlife Reserve and to the southwest by international boundary with India. Valmiki Tiger Sanctuary and Udaipur Sanctuary lie across the Indian border in Bihar, with the not adjoining but close, Sohagbarwa Sanctuary lying to the southwest in Uttar Pradesh, India. The contiguous surface area of these five protected areas is well over 2000 sq km, making it one of the largest protected area in the lowlands of the Indian sub-continent.

At the local level, pressure from the adjoining buffer zone villages for the resources from the park is very heavy. About 232,000 people living in buffer zone impact upon the park. It is estimated that eight to ten people are killed annually by rhinos and tigers and about 50% of the crops

are damaged by wild animal in some of the adjoining fields around the park. On the other hand, illegal grazing, fuel-wood collection, timber theft, grass and fodder cutting and boundary encroachment are obvious along the park edges.

The RCNP has developed a noticeable growing alliance between conservation and tourism. More than 100,000 tourists visited the park in fiscal year 1998/99, which contribute to more than 90% revenue generation of the park. Therefore the economics of tourism in RCNP have become central. These scenarios offer formidable challenges for balancing conservation priorities with human needs.

Nepal is one of the pioneers in combining conservation goals with the needs of the local people. The Department of National Parks and Wildlife Conservation (DNPWC) gradually shifted its management efforts to address parks and people issues. It was experienced that the paradigm of parks as isolated, heavily guarded units simply does not work, efforts to enforce such a model only increase resentment towards conservation. To bridge the gap between park and people living around them, the DNPWC brought buffer zone concept according to which 30-50% of the park revenue is channeled to the development activities in the buffer zone. Community development activities is contributing to establish better relationship by decreasing acerbity against the wild animal.

The Royal Chitwan National Park is located between 27^0 34' to 27^0 68' North latitude and 83^0 87' to 84^0 74' East longitude while the bufferzone extends further at 27^0 28' to 27^0 70' North latitude and 83^0 83' to 84^0 77' East longitude. It lies in the southern part of the mid-central administrative development region of the country and spans across portions of four districts namely, Chitwan, Nawalparasi, Parsa and Makawanpur. The name of the park is derived from the name of Chitwan District, as a major portion of the park lies in this district.

The RCNP was established under the provisions of National Parks and Wildlife Conservation Act 2029 (1973) and administered under the Royal Chitwan National Park Regulation 2030 (1974). The Act defines a National Park (IUCN Category II of Protected Area) as an area set aside for the conservation and management of the natural environment including fauna, flora and landscapes. It is primarily intended to

protect sites, landscapes or formations of scientific or aesthetic importance together with their associated flora and fauna. The second objective, provided it is compatible with the first, is to develop the area for tourism. Initially the park area was 544 sq km, which was extended to 932 sq km in 1977. Current GPS survey of the park boundary and GIS digitization based on 1992 topo maps show a total park area of 1182 sq km.

The DNPWC brought forth the buffer zone policy in 1993 under the fourth amendment of the National Parks and Wildlife Conservation Act 1973. Subsequently, Buffer zone Management Regulation was passed on 1996 and the buffer zone of RCNP was declared in the same year. While gazetting the buffer zone the area was estimated as 750 sq km. Current GPS survey of the buffer zone boundary and GIS digitization based on 1992 tops maps show a total area of 766 sq km.

The buffer zone is an area peripheral to the park and is also regarded as a zone of impact. The buffer zone is defined as per the fourth amendment of NPWC Act as an area surrounding a park or a reserve encompassing forests, agricultural lands, settlements, village open spaces and many other land use forms (HMGN 1996). The bufferzone of RCNP is spread over Chitwan, Nawalparasi, Parsa and Makawanpur Districts covering whole or parts of 35 VDCs and 2 Municipalities (233 Wards, approximately 510 settlements) with 36193 households having a total estimated population of 223,260. The area is inhabited by an assortment of indigenous and migrant ethnic/caste/occupational groups.

Brief Conservation History

The history of wildlife conservation had started since the Rana regime (1846-1950) in the Chitwan valley as privileged class hunting ground. Royalties from Europe and Princely States of India were invited to take part in grand hunting, records show as many as 120 tigers, 38 rhinos, 27 leopards, and 15 bears killed in the valley by a hunting party. However, such irregular big hunting hardly affected the total population of wildlife in Chitwan. The declaration of rhinoceros as a Royal Game and stringent punishment of the poachers was introduced by Prime Minister Jung Bahadur Rana in 1846.

Before 1950s the Terai forests were given some protection by the Rana rulers of Nepal in order to pursue their sports of big game hunting. In addition, to the decree from the Rana rulers, the deadly malaria infestations provided a natural protection to the forest from human interventions.

Soon after the collapse of Rana regime, wildlife poaching was alarming in Chitwan, the population of rhino and tiger was reduced to a bare minimum. During 1950s malaria eradication scheme was started, because of this the population of Chitwan valley almost tripled. The influx of subsistence population was so intense that Chitwan lost 61,657 ha (49%) absolute forest cover between 1927 - 1977.

The earliest wildlife management step in Chitwan was taken by establishing a "rhino sanctuary" in 1957 followed by the establishment of "rhino patrol" to protect the rhinos. The Wildlife Protection Act 2015 (1957) provided legal basis for the protection of wildlife. Mahendra Mriga Kunja (Mahendra Deer Park), comprising the areas of Tikalui forest from Rapti River to the foot hills of the Mahabharat extending over an area of 175 sq km was declared by the late king Mahendra in 1959.

In 1963, the area south of Rapti River was demarcated as a rhino sanctuary. The National Parks and Wildlife Conservation Act 2029 was ratified in 1973 and the Royal Chitwan National Park was eventually gazette in 1973 as the first National Park in Nepal. Later, in 1975, the Royal Nepal Army joined the park with a sole responsibility of law enforcement. Gainda Gasti (rhino patrol) became responsible for the protection of rhino outside the park boundary. The park was extended from 544 sq km to 932 sq km in 1977.

The management of RCNP started since 1973 and the first plan was prepared for the scientific management of this national park in 1975 for a period of five years. This plan was not fully implemented and was not revised afterwards following to which management is taking place on an *ad hoc* basis.

Tourism in the park had started before the establishment of the park. The first resort in the park, Tiger Tops Jungle Lodge, was already in operation well before the RCNP was created. Until now HMGN has allowed seven concessionaires to operate within the park on a long-term concession arrangement. In addition, there are about 65 small to medium sized hotels located in the buffer zone mainly concentrated in Sauraha area, who take their clients to the park.

Many long term and short-term research projects were in operation since the beginning of the RCNP, prominent one was the Nepal Tiger Ecology Project started together with the establishment of the park in 1973. RCNP has also contributed to the establishment of alternative rhino population by donating 4 individuals to Dudhwa National Park in India and translocating 52 animals to Royal Bardia National Park. Similarly, Gharial Breeding Center started in 1977 to replenish the dwindling population of gharial in the wild.

DNPWC brought forth the buffer zone policy in 1993 under the fourth amendment of the National Parks and Wildlife Conservation Act 1973. The Park People Program under UNDP assistance was launched by the DNPWC in late 1994 and based on the experience gained from the implementation of this program Buffer zone Regulation was passed on 1996 and the Bufferzone of RCNP was declared the same year.

The conservation is gradually taking an ecosystem management approach and considers management at a landscape linking different corridors and connectivity for long-term conservation. Establishment of Parsa Wildlife Reserve, continuation on the east of RCNP and Valmiki Tiger Sanctuary in India has increased the available habitat for wildlife.

Historical summary

Until 1950	-	Whole of Chitwan valley was forested
After 1950	-	Rapid changes in land use: malaria eradication, forest logging for agriculture, hill people migration
1959	-	Tikauli forest areas declared Mriga Kunj
By 1960	-	Area declared malaria free, about 65% forest cover lost, Wild buffalo and swamp deer locally extinct, Rhino population 200 in 1960 from 800 in 1950
1963	-	Forest south of Rapti river declared Rhino Sanctuary
1966	-	Only about 100 rhinos left
1973	-	Park was gazetted
1975	-	First management Plan prepared and implemented
1975	-	Royal Nepal Army joined for park protection and Gaida Gasti (Rhino patrol) for outside park area
1977	-	Area extended to present size from 544 km^2
1977	-	Gharial breeding center started
1984	-	**Designated World Heritage Site**
1985	-	Elephant Breeding Program started
1986	-	Rhino translocation started (into Royal Bardia National Park) altogether 87 individuals trans-located
1994	-	Buffer zone area declared and revenue sharing mechanism started
2002	-	Severe flood in Rapti river caused severe damages
2002	-	New five year management plan prepared and implemented
2003	-	UNESCO Enhancing Our Heritage Project initiated

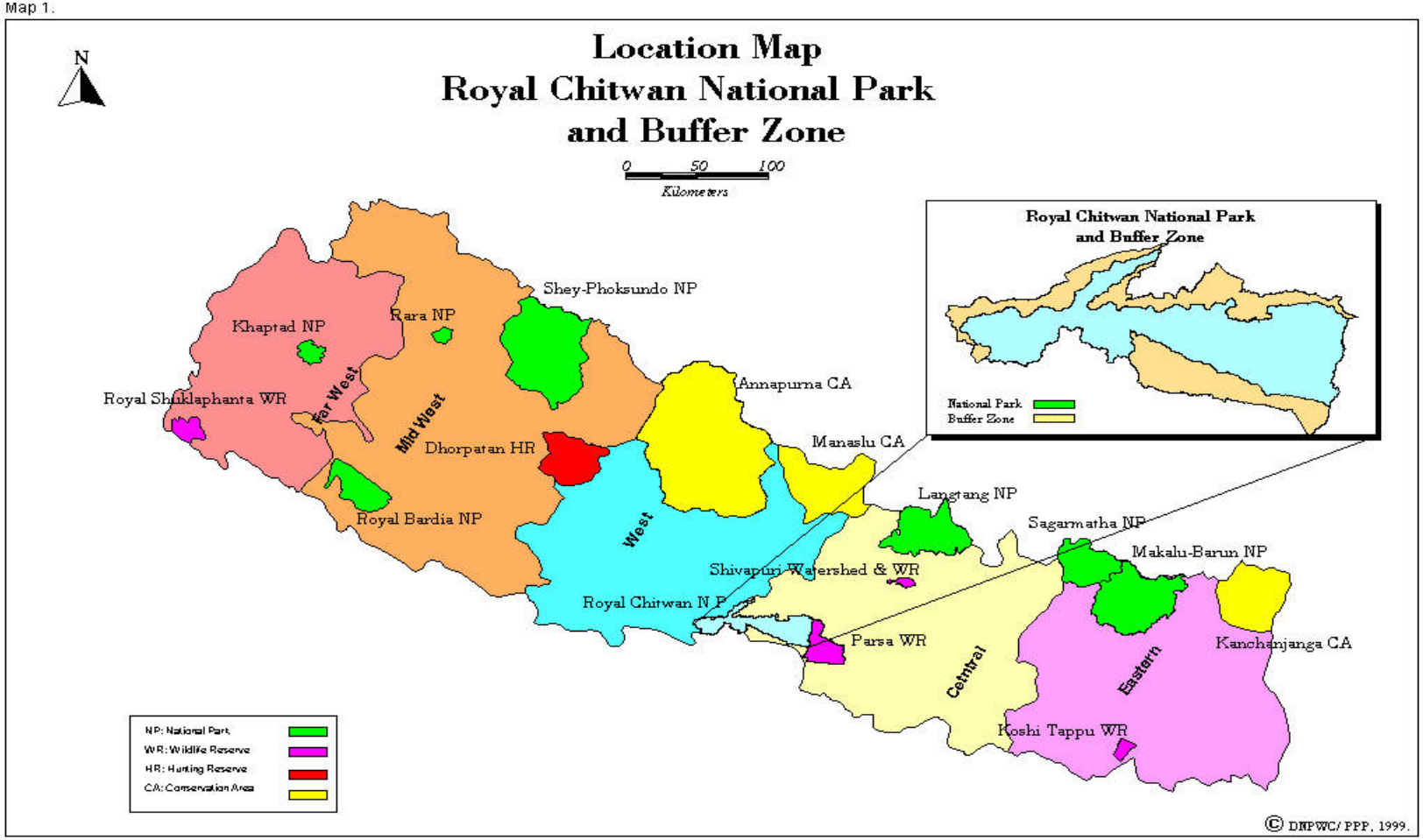
1.1 How the Evaluation was Carried Out

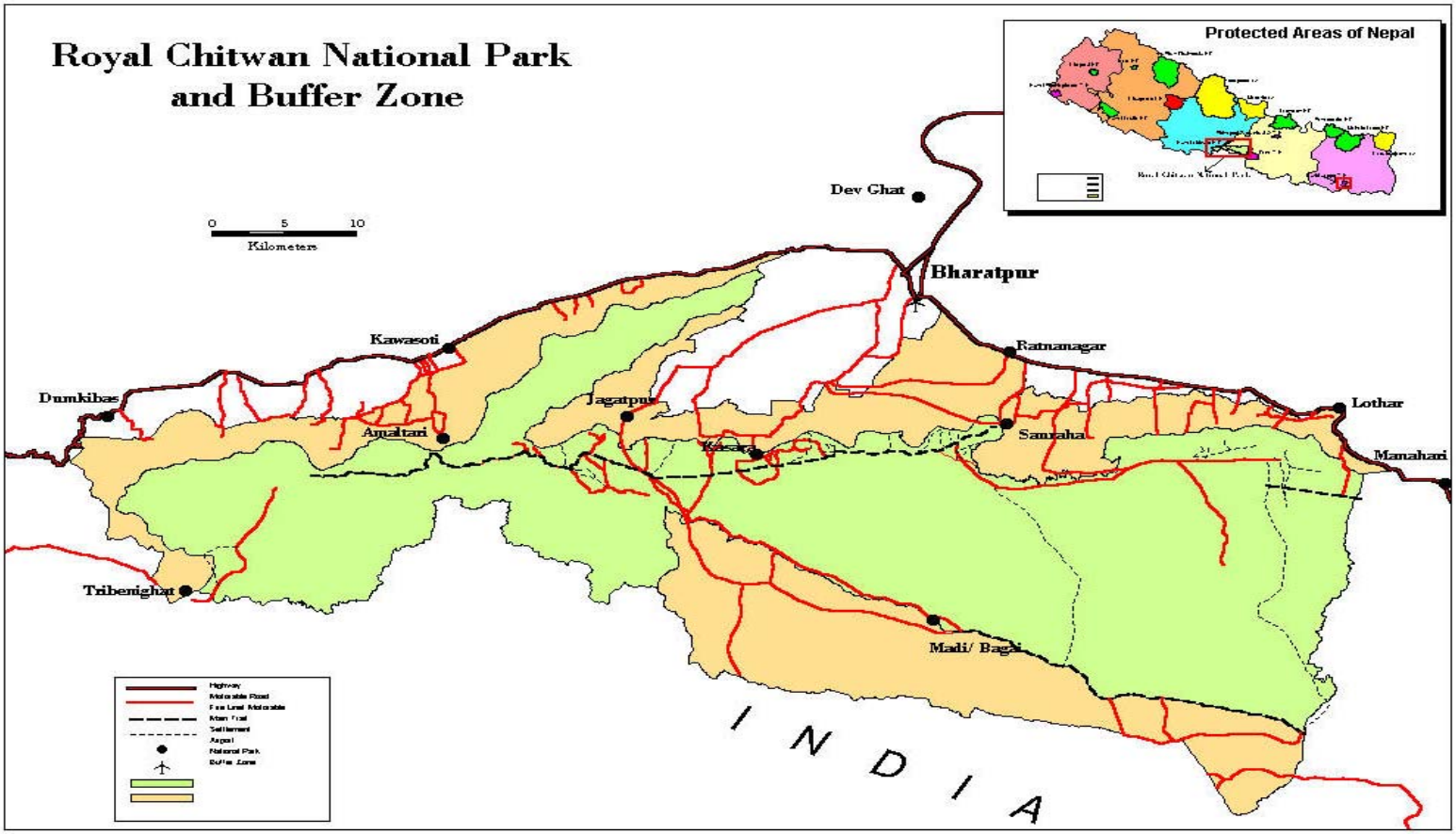
Various public consultations, meetings and workshops were organized under the guidance of DNPWC. Consultation meetings with BZMC , meetings/ interactions with CBOs, special target groups, women group members and other stakeholders were also organised. The year 2002 & 2003 was a period of unprecedented flooding in the site area causing great loss to habitat, infrastructure and biodiversity.

The core initial assessment team comprised of the following:

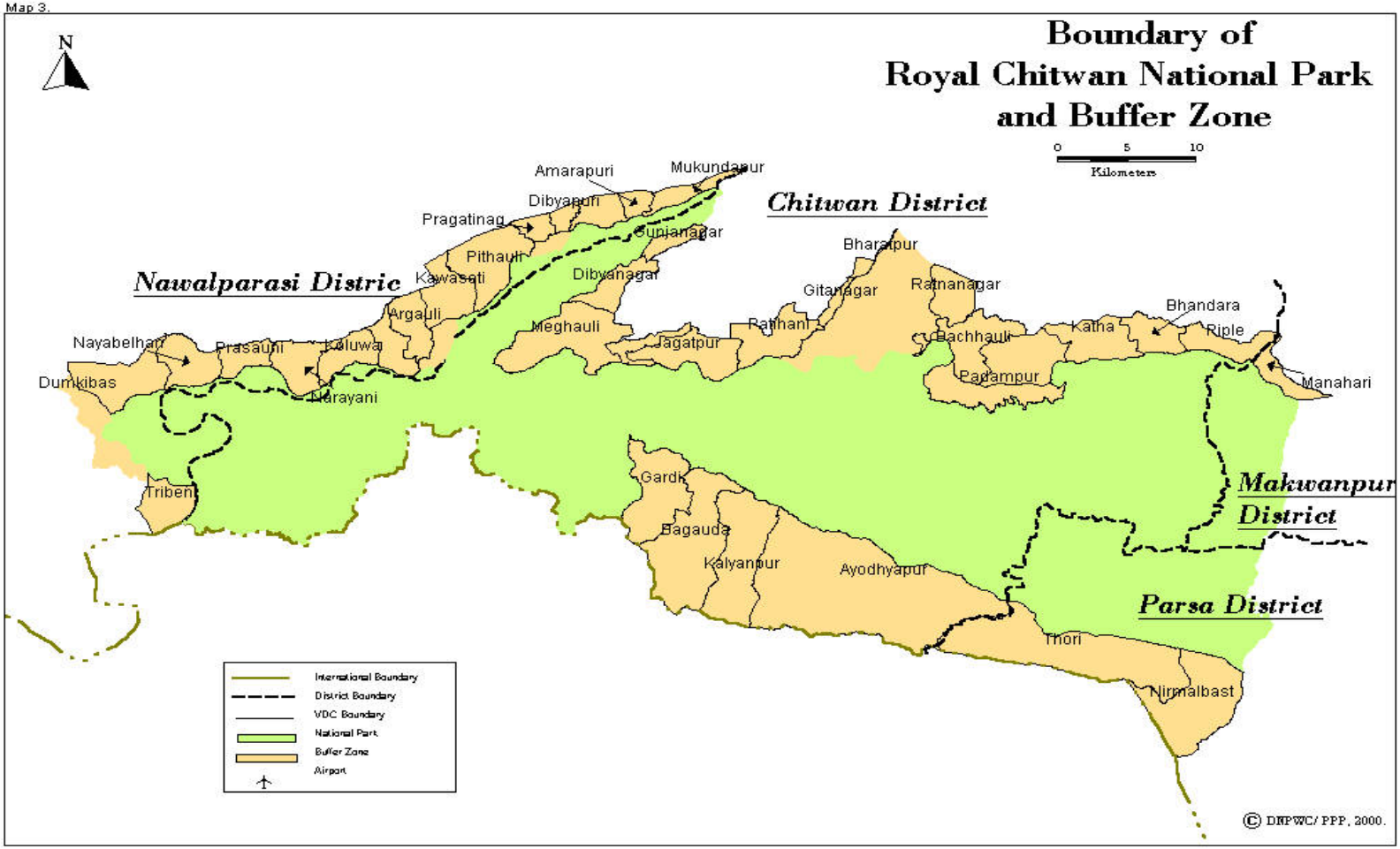
Team Leader	:	Mr. Narayan Poudel, DDG, DNPWC
Past and Present Chief Wardens/Warden	:	Mr. Puran Bhakta Shrestha
		Mr. Shiv Raj Bhatta
		Mr. Bed Kumar Dhakal
Representative from DNPWC	:	Mr. Balaram Soti
Representative from KMTNC	:	Mr. Bhuvan Keshar Sharma
DNPWC-UNESCO Project Leaders	:	Dr. S.M. Amatya
		Dr. T.M. Maskey
WII Scientists and Coordinators	:	Dr. V.B. Mathur
		Mr. B.C. Choudhury
WII-UNESCO Project Leaders	:	Mr. S.K. Mukherjee
		Mr. V.B. Sawarkar
		Mr. S. Singsit

Map 1.


Location Map
Royal Chitwan National Park
and Buffer Zone
N
0 50 100
Kilometers
Royal Chitwan National Park
and Buffer Zone
National Park
Buffer Zone
Shey-Phoksundo NP
Rara NP
Khaptad NP
Royal Shuklaphanta WR
Far West
Mid West
Dhorpatan HR
Royal Bardia NP
Annapurna CA
Manaslu CA
West
Langtang NP
Sagarmatha NP
Makalu-Barun NP
Shivapuri Watershed & WR
Royal Chitwan N.P.
Parsa WR
Central
Eastern
Kanchanjanga CA
Koshi Tappu WR
NP: National Park
WR: Wildlife Reserve
HR: Hunting Reserve
CA: Conservation Area
© DNPWC/ PPP, 1999.


Royal Chitwan National Park
and Buffer Zone
Protected Areas of Nepal
0 5 10
Kilometers
Dev Ghat
Bharatpur
Kawasoti
Ratnanagar
Dumkibas
Jagatpur
Lothar
Amaltari
Sauraha
Manahari
Tribenighat
Madi/ Bagai
INDIA

Map 3.


Boundary of
Royal Chitwan National Park
and Buffer Zone
N
0 5 10
Kilometers
Chitwan District
Nawalparasi Distric
Makwanpur
District
Parsa District
Amarapuri
Mukundapur
Dibyapuri
Pragatinag
Gunjanagar
Pithauli
Kawasati
Dibyanagar
Argauli
Meghauli
Jagatpur
Bharatpur
Gitanagar
Ratnanagar
Rathani
Bachhauli
Padampur
Katha
Bhandara
Riple
Manahari
Nayabelhani
Prasauni
Kaluwa
Narayani
Dumkibas
Tribeni
Gardi
Bagauda
Kalyanpur
Ayodhyapur
Thori
Nirmalbast
International Boundary
District Boundary
VDC Boundary
National Park
Buffer Zone
Airport
© DNPWC/ PPP, 2000.

2.0 CONTEXT REVIEW

2.1 Focal Management Targets

World Heritage Site Values

The Royal Chitwan National Park (RCNP) meets three criteria for the World Heritage natural properties. The park is an outstanding example of geological processes and biological evolution as the last major surviving example of the natural ecosystems of the Terai region (Criteria ii). The research on the natural history ecosystems of the area has been an important contribution to man's knowledge of ecological systems in the Terai.

The park also contains superlative natural features of exceptional natural beauty in terms of its scenic attractions of (Criteria iii). Additionally, the park provides critical and viable habitat for significant populations of several rare and endangered species, especially the one horned Asian rhinoceros and the Gharial crocodile (Criteria iv). The current management of the park and the buffer zone is an excellent example of government and community commitments for the protection of the heritage site.

Biodiversity Values

The biological richness of the park is outstanding with 8 ecosystem types which include 7 forest types, 6 grassland types, 5 wetland and 3 main river system habitats. The faunal diversity consists of 50 species of mammals, 526 species of birds, 49 species of reptiles and amphibians, and 120 fish species. The floral diversity of the park consists of more than 600 plant species which include 3 gymnosperm, 13 pteridophytes, 415 dicotyledons, 137 monocot, 16 species of orchids. The park harbors the rare tree fern (*Cyathea spinosa)*, cycas *(Cycas pectinata*), screw pine (*Pandanus furcatus)* and many endangered animals such as Asian one-horned rhinoceros (*Rhinoceros unicornis*),

Asiatic elephant (*Elephas maximus*), Bengal tiger (*Panthera tigris tigris*), gaur (*Bos guarus*), gangetic dolphin (*Platanista gangetica*), giant hornbill (*Buceros bicornis*), Bengal florican (*Houbaropsis bengalensis*), and Gharial (*Gavialis gangeticus*).

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Other Natural Values

Only one Protected Area in the inner Terai. This Park is one of the popular tourist destination site, which attracts more than 22% of the tourist visiting in the country. The main attractions in this park are its wilderness, forest, grassland, and wetlands with their outstanding wildlife sighting opportunities.

Cultural and Historic Sites in the Park

Besides biodiversity, RCNP is also known for various cultural and historical sites. In the east there exist a famous Budhist gomba near Sahapur on the park boundary. Bikram Baba temple next to the park headquarter is a Hindu shrine where annually thousands of people pay homage. In Bankattt, Hindu religious temples and shrines of local importance are the Shivling, Parsuram kunda, Panch Pandav temple and Godak Nath temple. In Kuzouli, there is a famous Siddhababa shrine with a holy pond of local importance. In the extreme west of the park, the famous Balmiki Ashram, Brahma Chauri and Laxmi Narayani temple with historic and religious significance are located where thousands of Nepali and Indian pilgrims pay their visit annually.

Cultural and Historical Sites in Buffer Zone

Tribeni Ghat (confluence of three rivers) area with the Balmiki Asram in the south west of the park adjacent to the Indian border is a significant eco-religious site for Hindu pilgrims. In the Madi valley Ayodhyapuri is a famous historic and religious sites regarded as Pandav's dwelling place during their jungle life. The attractions are Baikuntha lake, Shivling, Stone made boats, Parsuram kunda, etc. The Tharus, Darais, Botes and Kumales are indigenous group with unique lifestyle of cultural importance. Culture and tradition of the indigenous Tharu ethnic group exists in Bhandara, Kumrose, Madi Kalyanpur, Jagatpur, Meghauli, Jankauli, Bacchauli. Whereas Bodreni area of Bachhauli VDC has a Tamang dominated culture. Similarly, the way of life and culture of other ethnic groups are equally interesting in these sites as well as other sites in the buffer zone.

The wetland area in the buffer zone known as Bishhazari Lake, is an important destination for migratory and residential birds as well as other wildlife. It is also proposed as a Ramsar site. Surrounding habitats of the lake is serving as wildlife corridor linking Teria, Churiya, Inner Terai and Mahabharat.

GAPS

- Lack of rigorous/in-depth scientific studies to understand/conserve ecological complexities.
- Inadequate database and absence of biological monitoring system.
- Less scientific knowledge about the dynamics of grassland, wetland and riverine ecosystems.
- Little understanding of tourism impact.
- Little understanding of impact of development activities on conservation.
- Quantification of ecological and economic values
- Inadequate documentation of cultural values and indigenous knowledge for effective conservation.
- Inadequate knowledge about the social mobilization and ecological process.

RECOMMENDATIONS

- Conduct/promote rigorous/in-depth scientific and socio-economic studies gradually to fill in the above gaps.
- Establish database and biological monitoring system within three years.
- Prepare and implement a Human Resource Development Plan.

Focal Management Targets Data Sheet

	Focal Management Targets	World Heritage Values	Additional Attributes	Information on status
Biodiversity Values	Maintenance of natural ecosystems of RCNP	The biological richness of the park is outstanding with 8 ecosystem types, which include 7 forest types, 6 grassland types, 5 wetland and 3 main river system habitats.	Only viable corridor linking tropical to temperate ecosystems.	Very Good
	Management of critical and viable habitat for rare and endangered species	The park harbors the rare tree fern, Cycas, screw pine and many critical and viable habitats for rare and endangered species.	Links Parsa WLR, Balmiki tiger Reserve (India) providing biggest viable habitat for tiger. One of the Global 200 eco-region site.	Very Good
	Rare and endangered species conservation	RCNP harbors second largest population of Asiatic Rhino (544), Tiger (more than 120) with 60 breeding individuals, Gaur (above 200), Sloth Bear (above 200), viable population of Gharial and many others endangered mammals, birds, reptiles, and amphibians.	Provide breeding habitat for 526 species including endangered migratory birds, other mammals, reptiles, amphibians, insects including more than 156 species of butterflies. Successful captive breeding site for endangered wildlife like Gharial, Mugger, Turtle, Elephant etc.	Very Good

	Focal Management Targets	World Heritage Values	Additional Attributes	Information on status
Other natural values	One of the dynamic and highly productive grassland of lowland Nepal.	6 grassland types mainly *Saccharum* grassland, which supports viable population of rare and endangered wildlife.	Highest bio-mass per unit area in the world.	Very Good
	Important wetlands (more than 40 lakes, marshes, floodplains and 3 major river systems) including proposed Ramsar site	Includes important habitat of Dolphin, more than 526 species of birds including 6 endangered and numerous migratory birds.	Important breeding sites for wetland and endangered birds, reptiles and other aquatic life.	Very Good
	Scenic and natural beauty	Provides outstanding scene capturing altitudinal variation from 100 m to more than 8000 m with views of majestic Himalayas. It also includes wilderness forest, grassland, and wetlands with their outstanding wildlife sighting opportunities.	Provide satisfaction to more than 22% of total tourist visiting Nepal.	Very Good
Cultural / Social values	Ecotourism		Income generation and employment opportunities - Nature guide - Local farmers - Local hoteliers - Local ethnic group	Good

	Focal Management Targets	World Heritage Values	Additional Attributes	Information on status
Cultural / Social values	Buffer Zone Development to promote ICDP		• 50% of park's revenue sharing • Management of community forest • Fulfill subsistence needs (thatch grass) for more than 80,000 people/year. • Capacity/skill enhancement of local community • Economic upliftment options for local people through IGAs • Institutional strengthening through participatory approach.	Very Good
	Cultural Conservation		• Unique Ethnic culture of indigenous people (Tharu, Musahar, Bote etc.) of lowland Nepal • Important religious and cultural site like Tribeni, Valmiki Asram, Bikram Baba and other sites.	Fair
	Regional Hydrology		Three major river systems and their tributaries provide irrigation opportunities.	Fair

2.2 Identifying Stresses and Threats

Current Threats

Some of the major threats to the park are:

a) *Soil erosion:* The park and its surrounding environs are a geomorphic composite of 'dun' lowlands enclosed by rugged small mountains. The vast amount of debris is brought from to the three major river systems of the park – namely Narayani, Rapti, and Reu. Nearby small mountains are prone to soil erosion due to heavy rain during the monsoon season and steep slope of the mountains.

b) *Flooding:* Annually a large amount of boulders, sand and silt are deposited by the major river systems causing serious floods. Such folds and resultant bank cutting destroys agricultural lands, natural vegetation and human settlements. Last monsoon, a vast tract of grassland was washed away along the Rapti river and several wildlife was washed away. Buffer zone community development program has helped in river training, but special measures have to be taken to protect watersheds and catchments areas, particularly that of Rapti river.

c) *Plant succession and invasion by alien species:* One of the serious threats to the park is the plant succession – displacement of short grasslands by tall grassland species, the colonization of sandy grasslands with tall *Saccharum,* encroachment by fire-resistant specdie3s, and spread of climber. The park is suffering from invasion by alien species such as *Eupatorium* species, *Lantana camera*, and *Meconia chinensis*.

d) *Wildlife poaching:* In spite of all the efforts to control, wildlife poaching is still the most serious threat to the park. Poaching of rhinoceros by shooting, electrocution, and poisoning still continues. Special anti-poaching program has been operational to combat the poaching.

e) *Industrial pollution:* The East-West highway of the country traverses through Chitwan and Nawalparasi districts. Thus, it has made these districts an area of high industrial growth in recent times. Different kinds of large-scale industries have sprung-up along the road stretching from Hetauda-Ratnanager-Bharatpur and Narayangarh-Gaindakot to Kawasoti towns. The emissions produced by these industries pollute the air and effluents pollute the streams. The sewage of Hetauda and Narayangarh towns is released directly in the river systems while industrial effluents are discharged into river and streams without treatment. The garbage of hotels in Sauraha area is dumped into Rapti river. Use of chemical fertilizers and pesticides has increased and their residue affects water quality of the river systems. River pollution has adversely affected the aquatic life including Gharial and Gangetic dolphin.

f) *Livestock and crop depredation:* Livestock and crop depredation by wild animals in adjoining cultivated fields is one of the outstanding threats, which need to be addressed to resolve the park-people conflict. The agricultural crops are seasonally raided by rhinoceros, deer, wild boar, and occasionally by wild elephants.

Potential Threats

a) *Infrastructure development activities:* The construction of dam near Tribeni-Bhainsalotan, along the south-western boundary of the park, has disrupted the free movement of aquatic fauna including dolhin and, Gharial crocodile. Likewise, newly renovated road from newly constructed bridge (Kasara to Dhruba) and the proposed power transmission line from Dhruba to Bankatta poses threat to the park as these dissect the park (north-south) almost into two halves. As per the development aspirations of the local people and local

government, a lot of infrastructures have been built to provide access and services. It is envisaged that such development will continue to grow rapidly.

b) *Unregulated tourism:* The park had only one concessionaire lodge and about 5000 visitors in 1977. By 1998/2000, there were seven concessionaires operation inside the park and more than 60 lodges outside the park. The visitor volume has increased by 21-fold. Unregulated tourism has resulted in various adverse environmental impacts. Visitors are taken to the core zone of the park on elephant and vehicles. Some adverse impacts on the biodiversity of the park are habitat disturbance, damage to the vegetation, and pollution. The site is one of the most famous tourist destinations in the country.

GAPS

- Lack of control on river pollution –Narayani and Rapti river.
- Lack of information on succession and control of invasive exotic species..
- Inadequate information on visitor's carrying capacity.

RECOMMENDATIONS

- Monitor the pollution level in the river systems and initiate mitigating measures within three years.
- Explore and apply management intervention to control invasive species within two years.
- Conduct various studies to understand ecological processes within three years.
- Conduct studies to understand visitor carrying capacity within two years.

Identifying Stresses and Threats Worksheet

Threats to World Heritage Values	Key threat-related factor to be assessed	Focal Management Target affected	Attributes for consideration in status measurement
Current threats	Stress: Alternation of habitat due to soil erosion and flood	All FMT	Annual measure of selected habitats
	Source: Improper management of the upper catchments of Rapti and Narayani rivers: fragile geo-morphology.		Management of upper catchments area.
	Stress: Reduction in habitat availability due to proliferation of invasive species	FMT 1	Habitat loss Change in species composition Loss of endemic taxa
	Source: Change in microclimatic condition, organic matter in flow with water		Extent of area infested with weed
	Stress: Contamination of water bodies	FMT 1	Water quality monitoring Census of aquatic fauna
	Source: Industrial pollution, intensive agriculture using organic chemicals		Monitoring of industrial effluents
	Stress: Decrease in wildlife population of key species	FMT 1, 2	Census of key species Monitoring of offences

Threats to World Heritage Values	Key threat-related factor to be assessed	Focal Management Target affected	Attributes for consideration in status measurement
	Source: Wildlife poaching		Official records and publication
	Stress: Rising antagonism of local communities towards park	FMT 3	Amount of compensation Compensation process
	Source: Livestock and crop depredation		Regular monitoring
Potential Threats	Stress: Habitat fragmentation, disturbance and loss	FMT 1	Habitat mapping and assessment
	Source: Intensification of infrastructure development		District, regional level plan
	Stress: Cultural pollution and change in wildlife behavior	FMT 3	Socio-cultural and behavioral study of wildlife
	Source: Mass tourism		Pollution, vandalism, solid waste

2.3 Engagement of Stakeholders/Partners in Management

The buffer zone communities are the principle stakeholders. Management is focusing its efforts to develop partnership with the local communities. Park authorities are coordinating with other line agencies for other infrastructure development and services.

Buffer zone of RCNP has already established mechanisms to minimize biotic pressure and for the sustainable management of natural resources. The conciliatory and partnership approach adopted by the park are aimed to motivate local communities in the participatory management of forest resources to fulfill their needs of forest products. The long-term objective is to motivate local people and to win their support to involve them in nature and wildlife conservation. Different stakeholders are involved in conservation and management of the park and buffer zone:

Buffer zone

Buffer zone management committee is an apex community institution in the buffer zone with an elected body of 26 members. The buffer zone management committee is comprised of 21 elected chairpersons of buffer zone user committees, 4 representatives from the four district development committees adjoining to the park, and the chief warden of the park as the member- secretary of the committee. The first buffer zone management committee was formed in 1997. After completion of its five-year tenure, new committee has been elected. UG is the grass-root organization formed at the settlement level (comprising male and female user groups), which can further form functional organizations (FOs) depending on specific activities.

Scientific organization: (BCN, FZS, ZSL, Dartmoor National Park etc.)

NGOs, INGOs and donors:

Established in 1982 the King Mahendra Trust for Nature Conservation is mandated as an autonomous non-profit and non-governmental organization to work in the field of nature conservation. KMTNC launched a biodiversity conservation center in Sauraha, RCNP to assist the biological and research activities.

The Terai-Arc Landscape program has been jointly implemented by DNPWC and WWF Nepal program aiming to conserve biodiversity at landscape level. Similarly, Participatory Conservation Program (PCP) is a joint undertaking of HMG Nepal and UNDP.

Engagement of "Stakeholders" and "Partners in Management" Worksheet 1

Target/Management Objectives: FMT (Maintenance of natural ecosystems of RCNP)

	Factor	Local people (BZMC, UC)	Local hoteliers	Tourist	Nature Guides	(I)NGOs	Scientific Research Organizations	Govt. Departments	Royal Nepalese Army
Understanding Stakeholders	**Economic dependency**	Moderate	High	None	High	High	High	Low	High
	Impacts (Negative Impacts on Environment)	Moderate	High	Moderate	Low	Low	Low	Low	Low
	Impacts (Positive Contribution)	Moderate	Moderate	Moderate	High	High	High	Moderate	High
	Willingness to engage	Moderate	Stakeholder: High Park Mgmt: Moderate	High	High	High	High	Moderate	High
	Political / Social Influence	High	High	Low	Low	Moderate	Low	Moderate	Low
	Organization of Stakeholders	Legally institutionalize/operationalize	Well organized	Partly organized	Organized	Organized	Organized	Organized	Highly organized

	Factor	Local people (BZMC, UC)	Local hoteliers	Tourist	Nature Guides	(I)NGOs	Scientific Research Organizations	Govt. Departments	Royal Nepalese Army
Assessment of Stake-holder Engagement	**What opportunities do stakeholders have to contribute to management?**	Natural resource management in buffer zone area Community development Income generating activities Conservation programs in buffer zone	Eco-tourism promotion: Employment generation	Low involvement	Ecotourism Reporting	Park management, Conservation ducation, Human Resource Development and others	Research and study	Support in park management and anti-poaching	Park protection
	What is the level of engagement of the stakeholder?	Moderate	Moderate	Low	Moderate	High	High	Moderate to high	High
Summary	**Overall adequacy of stakeholder engagement** (Very good, Good, Fair, Poor)	**Good**	**Fair**	**Poor**	**Fair**	**Good**	**Good**	**Good**	**V. Good**

Engagement of "Stakeholders" and "Partners in Management" Worksheet 2

Target/Management Objective: Biodiversity values

	Factor	Local people	Local hoteliers	Tourist	Nature guide	NGOs	Scientific Research Organization	Govt. Organization	RNA
Understanding Stakeholders	**Economic dependency**	Moderate	High	Low	High	Low	Low	Low	Low
	Impacts (Negative Impacts)	Moderate	Moderate	Moderate	Low	Low	Low	Low	Low
	Impacts (Positive Contribution)	Moderate	Moderate	Low	Moderate	High	High	Moderate	High
	Willingness to engage	Moderate	Low to moderate	Moderate	Moderate to high	Moderate to high	High	Moderate to high	High
	Political / Social Influence	High	High	Low	Low	Low	Low	Low	Low
	Organization of stakeholders	Organized	Organized	Organized	Organized	Organized	Organized	Organized	Organized
Assessment of Stakeholder Engagement	**What opportunities do stakeholders have to contribute to management?**	Engage in BZ management & Park conservation activities Employment Other NR management of BZ	Engage in planning of eco-tourism activities		Flood relief				
	What is the level of engagement of the stakeholder?	Moderate	Moderate	Moderate	Moderate				
Summary	**Overall adequacy of stakeholder engagement** (Very good, Good, Fair, Poor)	**Fair**	**Good**	**Good**	**Good**	**Good**	**Fair**	**Fair**	**Fair**

Engagement of "Stakeholders" and "Partners in Management" Worksheet 3

Target/Management Objective: FMT (Other natural values)

	Factor	Local people	Local hoteliers	Tourist	Nature guide	NGOs	Scientific Research Organization	Govt. Organization	RNA
Understanding Stakeholders	**Economic dependency**	High	High	Moderate	High	Moderate	Low	Low	Low
	Impacts (Negative Impacts)	Moderate	Moderate	Moderate	Low to moderate	Low	Low	Low	Low
	Impacts (Positive Contribution)	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Moderate
	Willingness to engage	High	Moderate	Low	Moderate to high	Moderate to high	Moderate	Moderate to high	Low
	Political / Social Influence	High	High	Low	Low	Low to moderate	Low	Low	Low
	Organization of stakeholders	Organized	Organized	Disorganized	Organized	Organized	Organized	Organized	Organized
Assessment of Stakeholder Engagement	**What opportunities do stakeholders have to contribute to management?**	Engage in community development and cultural conservation	Promote cultural conservation activities						
	What is the level of engagement of the stakeholder?	Moderate	Moderate	Low	Moderate	Moderate to high	Low	High	
Summary	**Overall adequacy of stakeholder engagement** (Very good, Good, Fair, Poor)	**Very good**	**Fair**	**Poor**	**Good**	**Good**	**Fair**	**Good**	**Fair**

Engagement of "Stakeholders" and "Partners in Management" Worksheet 4

Target/Management Objective: Buffer zone development

	Factor	Local people	Local hoteliers	Tourist	Nature guide	NGOs	Scientific Research Organization	Govt. Organization	RNA
Understanding Stakeholders	**Economic dependency**	Moderate to high			Low to moderate	Low	Low	Moderate	
	Impacts (Negative Impacts)	High	High	High	Low	Low			
	Impacts (Positive Contribution)	Moderate	Low	Low	Moderate	Moderate			
	Willingness to engage	Moderate	Low	Low	Moderate	Moderate	Moderate	High	High
	Political / Social Influence	High	High	Low	Low	Low to moderate	Low		Low
	Organization of stakeholders	Organized	Organized		Organized	Organized	Organized	Organized	Organized
Assessment of Stakeholder Engagement	**What opportunities do stakeholders have to contribute to management?**	Participatory watershed management, river training, soil conservation opportunities	River training			Fund raising and organizing local people in relief program	Scientific research and study	Promote participatory watershed management	
	What is the level of engagement of the stakeholder?	Moderate	Low	Low	Moderate	Low	Low	High	Moderate
Summary	**Overall adequacy of stakeholder engagement** (Very good, Good, Fair, Poor)	**Good**	**Poor**	**Poor**	**Fair**	**Fair**	**Poor**	**Good**	**Fair**

Stakeholder Engagement Summary Table

Focal Management Target / Management Objective	Local people	Local hoteliers	Tourist	Nature guides	NGOs	Scientific Research Organizations	Govt. Organizations	RNA	Overall Stakeholders Engagement for Target/ Objective
Biodiversity Values	Fair	Poor	Good	Good	Good	Good	Good	Good	Good
Other Natural Values	Fair	X	X	X	Good	Good	Good	Good	Good
Cultural/Social Values	Good	Good	Fair	Good	Good	Good	Good	Good	Good

2.4 Review of National Context

Nepal has established extensive network of protected areas covering more than 18 % of the total land of the country. His Majesty's Government of Nepal has established strong and progressive legal mechanism for biodiversity conservation in the country. The Wildlife Conservation Act 1957 was the first to identify the importance of protecting wildlife under which rhino sanctuary was declared in Chitwan.

Effective conservation program started from 1972 by enacting the NPWC Act 1972. Royal Chitwan National Park was the first national park declared under that Act. Main and supportive legal instrument to conserve biodiversity of the country are given below:

Main and supportive legal instruments to conserve biodiversity and the Protected Area:	
• NPWC Act, 2029 (1973) and amendments; • NPWC Regulation, 2030 (1974) and amendments; • NPWC Act, 2029 (Fourth Amendment 1993 with Buffer zone provision); • Buffer zone Management Regulation, 1996; • Ramsar Convention; • Aquatic Animal Protection Act, 1961; • Soil and Water Conservation Act, 1982;	• Water Resources Act, 1992; • Electricity Act, 1992; • The World Heritage Convention; • Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); • Convention on Biological Diversity (CBD); • Forest Act, 1993; • The Environment Protection Act, 1996.

Nepal is also one of the pioneering nations in combining conservation goal with the need of local people. DNPWC gradually shifted its management effort towards addressing park and people issues by introducing the buffer zone concept in the protected areas. The buffer zone program allows up to 50% of the park revenue for biodiversity conservation and overall community development. Royal Chitwan National Park is the first protected area to implement buffer zone regulation. Up to now more than one hundred million Nepalese Rupees has been

provided to the local people for the buffer zone development. Buffer zone management committee formed by the users of the buffer zone is responsible for implementing ICDPs under this program.

GAPS

- Inadequate coordination mechanisms with development organizations.
- Conflict due to contradictory Decentralization Act

RECOMMENDATIONS

- Proper coordination mechanisms need to be established to promote sustainable development.
- Inter-sectoral and inter-ministerial committee should be established to amend the conflicting Acts.

Review of National Context: Data Sheet

Criteria	Strengths	Weaknesses
World Heritage Site and PA Legislations	RCNP is a duly gazetted PA under the provisions of the National Parks and Wildlife Conservation Act 1972. There is separate Royal Chitwan National Park Regulation 1973 to provide management guidelines.	The present legislation does not directly allow the park authorities to control river pollution originating beyond the park boundary.
Conservation within broader government policy	There is a Ministry of Forests and Soil Conservation at the Central Level and separate Dept. of National Parks and Wildlife Conservation at the central level. His Majesty's Government of Nepal (HMGN) has enacted several legislations for protecting environment, forest and wildlife. Besides this Ministry of Tourism and Civil Aviation is responsible to formulate tourism policy and guidelines for management of tourism in the country.	There is a genuine apprehension that the economic consideration of agencies like tourism may undermine conservation values.
International conservation convention treaties	RCNP is a World Heritage Site and contains area which has been proposed for Ramsar site nomination. Nepal is a signatory to CBD, CITES, Ramsar and WH Convention.	Little funding support is available under International Conventions and treaties to which Nepal is a signatory.
Government Support	His Majesty's Government of Nepal is committed for the management of RCNP as a WH site. HMGN has deployed Royal Nepal Army (RNA) for the protection of the park.	Current financial rules and regulations of HMGN do not allow direct fund raising by the park.
National PA agency and the WH site	The high profiles of RCNP have strong potential to attract support for conservation from national and international agencies.	

3.0 PLANNING ASSESSMENT

3.1 Management Planning Assessment

List of planning documents for World Heritage Site:

Name of the plan	Year of preparation or most recent review	Level of approval of the plan (L, G, A, S/A, D)*	Year specified for the next review of the plan
Royal Chitwan National Park and Buffer Zone Management Plan 2001- 2005	2000	G	Beginning of 2005
Tourism Management Plan 2003 – 2007	2002	A	Beginning of 2007

Adequacy of Management Plan:

- The plan addresses core and buffer zone issues.
- All stakeholders were actively involved in plan preparation.
- Although the plan states management objectives and programs clearly, however financial resources are not ensured.
- The plan mentions regular monitoring, but it does not link with the MIS developed by DNPWC.

GAPS

- Lack of detailed scientific information on ecological processes.
- Monitoring and evaluation is not properly functional.
- Lack of adequate resources to implement prescribed management interventions.

RECOMMENDATIONS

- Conduct detail scientific studies and research on ecological processes.
- Functionalize MIS.
- Ensure funding by long-term agreement with donor agencies.

Adequacy of General Management Plan Data Sheet

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
Decision making framework	1. Plan establishes clear understanding of the desired future for the site (i.e. describes the desired outcomes of management in terms that provides a guide to management and decision making by site managers)	**Very Good**	VG – desired future is clearly and explicitly articulated as a decision making reference point G – desired future is clearly articulated F – desired future is not clearly articulated but is implied or can be inferred from plan objectives P – plan focuses more on present issues and actions and doesn't indicate a desired future for the site	
	2. Plan provides sufficient guidance on the desired future for the site for it to act as a decision framework for addressing new issues and opportunities that arise during the life of the plan	**Very Good**	VG – desired future is expressed in a way that provides clear guidance for addressing new issues and opportunities G – desired future is expressed in a way that focuses more on addressing current issues and opportunities F – desired future lacks clarity and does not provide an effective decision framework for the future P – plan focuses more on present issues and actions and doesn't indicate a desired future for the site	

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	3. Plan provides for a process of monitoring, review and adjustment during the life of the plan.	**Good**	VG – plan provides a clear, explicit and appropriate process for monitoring, review and adjustment G – provisions for monitoring, review and adjustment of the plan are present but are incomplete, unclear or inappropriate in some minor respects F – need for monitoring, review and adjustment is recognized but is not dealt with in any detail P – plan does not address the need for monitoring, review and adjustment	Plan has provision to evaluate implementation and review at the beginning of last year of the plan. Database for biological monitoring has not established.
Planning context	1. Plan provides an adequate and appropriate policy environment for management of the World Heritage Area	**Very Good**	VG – Policy requirements for the site are identified and adequate and appropriate policies are established with clear linkages to the desired future for the site G – Policy requirements for the site are identified and policies are largely adequate and appropriate F – Policies in the plan are inadequate or incomplete in major respects P – Plan either doesn't establish policies for the area or the policies are inadequate or inappropriate in major respects	

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	2. Plan is integrated /linked to other significant national/ regional/sectoral plans that influence management of the World Heritage Area	**Fair**	VG – Relevant national, regional and sectoral plans that affect the site are identified and specific provisions or mechanisms are included to provide for integration or linkage now and in the future G – Relevant national, regional and sectoral plans that affect the site are identified, their influence on the site is taken into account but there is little attempt at integration F – Some relevant national, regional and sectoral plans are identified but there is no attempt at integration P – No account is taken of other plans affecting the site	Coordination with other line agencies/Dept is a major issue. At the district level there is a coordinating mechanism, however wildlife issues have less priority. At the regional level efforts is being made to improve and integrate the management plans in the regional planning process.
Plan content	1. Plan is based on an adequate and relevant information base	**Very good**	VG – The information base for the plan is adequate in scope and depth and is matched to the key decisions, policies and issues addressed in the plan G – The information base is adequate in scope and depth but may contain some irrelevant information (i.e. a broad compilation of data rather than matching information to the decisions, policies and issues addressed in the plan) F – The information base has inadequacies in scope or depth so that some issues, decisions or policies cannot be placed into context P – Very little information relevant to plan decisions is presented	

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
Plan content	2. Plan addresses the primary issues facing management of the World Heritage Area within the context of the desired future of the site	**Very good**	VG – Plan identifies primary issues for the site and deals with them within the context of the desired future for the site (i.e. plan is outcome rather than issues driven) G – Plan identifies primary issues for the site but tends to deal with them in isolation or out of context of the desired future for the site F – Some significant issues for the site are not addressed in the plan or the issues are not adequately addressed P – Many significant issues are not addressed or are inadequately dealt with in the plan	
	3. Objectives and actions specified in the plan represent an adequate and appropriate response to the issues	**Very Good**	VG – Objectives and actions are adequate and appropriate for all issues G – Objectives and actions are adequate and appropriate for most issues F – Objectives and actions are frequently inadequate or inappropriate P – Objectives and actions in the plan do not represent an adequate or appropriate response to the primary issues	Objectives, issues, strategy and programs are clearly presented.

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
	4. Plan takes account of the needs and interests of local and indigenous people.	**Very good**	VG – Plan identifies the needs and interests of local and indigenous people and has taken these into account in decision making G – Plan identifies the needs and interests of local and indigenous people but it is not apparent that these have been into account in decision making F – There is limited attention given to the needs and interests of local and indigenous people and little account taken of these in decision making P – No apparent attention has been given to the needs and interests of local and indigenous people	Plan integrates buffer zone management plan as well.
	5. Plan takes account of the needs and interests of stakeholders other than Government involved in the World Heritage Area	Very good	VG – Plan identifies the needs and interests of other stakeholders and has taken these into account in decision making G – Plan identifies the needs and interests of other stakeholders but it is not apparent that these have been into account in decision making F – There is limited attention given to the needs and interests of other stakeholders and little account taken of these in decision making P – No apparent attention has been given to the needs and interests of other stakeholders	Implementation of plan jointly by different conservation partners and Buffer zone Management Committee.

Principle	Criteria	Assessment	Rating guidance (Very Good, Good, Fair, Poor)	Comments
Plan implementation	1. Plan provides adequate direction on management actions that should be undertaken in the World Heritage Area	**Good**	VG – Management actions specified in the plan can be clearly understood and provide a useful basis for developing works programs, budgets and other operational plans and programs G - Management actions specified in the plan can generally be clearly understood and provide an adequate basis for developing works programs, budgets and other operational plans and programs F – Management actions are sometimes unclear or lacking in specificity making it difficult to use the plan as a basis for developing works programs, budgets and other operational plans and programs P – Management actions are often unclear or lacking in specificity making it very difficult to use the plan as a basis for developing works programs, budgets and other operational plans and programs	The Plan provides adequate direction, and is used by PA management.
	2. Plan identifies the priorities amongst strategies and actions in a way that facilitates work programming and allocation of resources	**Very Good**	VG – Clear priorities are indicated within the plan in a way that supports work programming and allocation of resources G – Priorities are indicated but are sometimes unclear making their use for work programming and resource allocation more difficult F – Priorities are not clearly indicated but may be inferred P – There is no indication of priorities within the plan.	Plan provides issues and strategy as well as programs to prepare 'Annual Plan'.

3.2 Design Assessment

The park (932 km^2) boundaries extend from west bank of Narayani river, east bordering to Parsa WR, north by Narayani and Rapti rivers and south by the international boundary with India. The park includes about more than 40 lakes, 3 major river systems, around 23% grassland, and 7-10 types of forests providing the habitat for different species of wildlife. The park links with the Balmiki tiger reserve (India) in south, Parsa WR in east, and Barandabhar forest corridor in the north. In addition to that more than 750 km^2 of buffer zone also provides additional habitats for wildlife. The park covers a pristine area with a unique ecosystem of significant value in the world. It contains the Churiya hills, Oxbow lakes, and flood plain of Rapti, Rue and Narayani rivers. To manage the area the park has been divided in three zones and the buffer zone in four zones:

Park Zonation

1. Core zone: The core zones includes all the parks besides utility zone and management facility zone to preserve, protect and maintain natural ecosystems and processes in their natural stage. No human activities except special management intervention, research and monitoring will be allowed.
2. Utility zone: Designated hotel and campsite location, visitor center, museum, jungle drive routes, elephant routes, nature routes, grass and thatch cutting area, religious sites etc.
3. Management facility zone: The park head-quarter, sectoral headquarter and park posts protection unit headquarter and post, road and fire line networks and watch towers.

Zonation of Buffer zone

1. Sustainable harvest zone: It includes community and religious forest, private forest, and plantations.
2. Wildlife corridor: It includes buffer zone forest and other forest.
3. Physical facility zone: It includes road, industries and development sites.
4. Rural settlement zone: It includes agricultural lands, and market areas.

GAPS

- Scientific criteria have not been developed to measure effectiveness of different zones.
- No sustainable mechanism has been recommended to compensate wildlife victims.
- Little livelihood opportunities for disadvantage groups.
- Only few entrepreneurs capture most of the economic benefits of tourism.

RECOMMENDATIONS

- Develop scientific criteria to measure effectiveness of zonation.
- Develop proper mechanism to compensate wildlife depredation.
- Explore and provide more livelihood opportunities for disadvantaged groups.
- Develop proper mechanism to promote local people's involvement in tourism.

Design Assessment Data Sheet

Design aspect	Strengths of reserve design in relation to this aspect	Weaknesses of reserve design in relation to this aspect
A. Ecological integrity		
Key areas	Outstanding biological richness supporting 8 ecosystems and different species.	
Size	In addition to 932 sq. km. core zone, 750 sq. km of has been added as buffer zone.	
External interactions	Parsa WL in the east and Balmiki Tiger Reserve in the south provides additional habitat.	
Connectivity	The park includes inner Terai, Churia, Terai, which are connected to Mahabharat ranges through various corridors.	
B. Community well-being		
Key areas	Direct benefit by sharing 50% of park revenue, providing livelihood essentials (thatch grass) to local people.	
Size	750 sq. km. buffer zone through community forestry provides the opportunity to meet the demand of NR to local people. It ultimately reduces pressure to park. The BZ forests also provide additional habitat for wildlife.	Requires lot of financial and human resources.
External interactions	Enhances the cross-cultural exchange, which supports different economic, and management skill enhancement opportunities.	Increased inflation causing difficulty for local people.
Legal status	Strong Acts and Regulations with efficient implementation mechanism.	
C. Management factors		
Legal status	Strong Acts and Regulations with efficient implementation mechanism. Strong enforcement of Acts and Regulations due to the presence of RNA.	Protection cost is very high
Access points	Regulated 9 entry points.	
Neighbors	Park and buffer zones boundaries are gazetted.	4 public right-of-ways.

4.0 INPUT ASSESSMENT

4.1 Assessment of Management Needs

Staff Numbers

Chief Warden is the Chief Executive Officer of the park. The park headquarter is at Kasara inside the park. The other staff of the park are Assistant Conservation Officer-4, Assistant Veterinary Doctor-1, Ranger-18, Overseer-1, Veterinary Assistant-1, Senior Administrative Assistant-2, Legal Assistant-1, Accountant-1, Junior Admin Assistant-13, Accounts Assistant-1, Senior Game Scout-19, Game Scout-79, Pujari (priest)-1, Peon-2, Driver-2, Boatmen-2 and 20 temporary staff. Likewise, other elephant stable staff are Officer-1, Senior Elephant Management Assistant-1, Junior Elephant Management Assistant (Daroga,Raut)-5, Phanit (elephant driver)-39, Pachuwa and Mahout (elephant caretaker)-80, Dhami-1, Tailor-1, Junior technician-1. In addition, the protection of RCNP is carried out by a battalion of Royal Nepal Army.

Staff Skills, Training and Amenities

The Management Plan under the institutional strengthening lists several training in wildlife management/handling techniques, conservation education, data collection, monitoring and evaluation, training for RNA protection unit staff on conservation, fire fighting, anti poaching, PRA, TOT, basic computer, GIS and GPS, eco-tourism, legal aspects, special trainings for elephant staff and buffer zone committees. The frontline staff in the park is mostly untrained. Amenities provided to the staff are uniforms and few field gears and ration (food).

Funds

Funds for management of the park are allocated by the central government. Out of the total revenue collected in the park, fifty percent is deposited in the central treasury, while fifty percent is deposited at park level to be used in buffer zone management programs for local communities. However, the deposited fund is not directly available for park management.

Budget and Allocation of Resources

The budgetary requirement has been drawn in the management plan very clearly and estimates are annually submitted to the central government for allocation of fund. However, the actual release of funds is very low as well as it varies from year to year.

Equipment and Infrastructure

Equipment and infrastructure of the park include 5 vehicles, 8 motorcycles, several bicycles, wireless network, boats, computer, and generator. This park also consists of 57 elephants used mainly for eco-tourism, anti poaching, problematic animal management, wildlife translocation, and rescue activities. The RNA protection unit staff have their own equipment including several vehicles, fire arms, etc. However, most of the vehicles are not in good condition. There is urgent requirement for equipment for habitat management, anti poaching operation, fire-fighting equipment, construction of bridge, watchtower, forest road, staff quarter, guard posts etc.

GAPS

- Inadequate opportunities for capacity building of the frontline staff.
- Inadequate budget for park management activities as recommended by the management plan.

RECOMMENDATIONS

- Training need assessment should be carried out and gradually implemented.
- Seek funding from other sources.

Expenditure Budgets

Programs	**Estimated Budget 2002 – 03 (NRs '000)**
Conservation Education	60
Habitat conservation and improvement	210
Species conservation	930
Physical infrastructure	1550
Buffer zone development program	30000
Administrative cost	24200

The above estimated budget does not include the budget of RNA protection unit, and the projects implemented in collaboration with other conservation partners – BCC/ KMTNC, PCP (UNDP), TAL (WWF Nepal program), ITNC.

Royal Chitwan National Park, 2002 – 2003
Revenue: 31 million

4.2 Rating system for Process Indicators

Most of the issues has been effectively addressed. The overall effectiveness is 94%. The issue related to maintenance of different infrastructure and equipments needs to be addressed.

Rating System for Process Indicators Worksheet

Issue	Criteria	Rating
1. Legislation	Legislation and its amedment are approperiate and timely	3
2. Law enforcement	Law enforcement capacity is excellent	3
3. Planning	An approved management plan exits and is being implemented gradually	2
Additional Points	The planning process adopt participatory approach to integrate the input from local stakeholder	+1
	There is an established schedule and process for implementation review of the management plan	+1
	Government shares revenue with local community for the management of BZ	+1
4. Resource Inventory	Detailed profile of Park and Buffer Zone exist.	3
5. Resource management	Available resource efficiently managed	3
6. Maintenance	Most equipments needs maintinance	1

7. Neighbors	There is formal process of participation of local people through buffer zone management committee	3
Additional points	Government is providing annually 50% of park's revenue to implement community development programs in the buffer zone	+1
	Forests of the buffer zone have been handed over to local community to manage and fulfill their daily requirement of forest products and provides additional habitat for wildlife.	+1
8. Economic benefits to local communities	There is a major flow of economic benefits to local communities from the existence of the protected area through eco-tourism and employment opportunities through developmental activities.	3
	Buffer zone community forest generate sufficient financial resources to local people through eco-tourism inside BZ community forest	+1
9. Communication	Park authority through different conservation education/awareness programs and co-ordination mechanisms facilitate the process of participatory approach to the buffer zone group, BZ committee, and BZ management committee.	3
10. Management systems	Participatory management system encouraged by the BZ regulation	3
Additional points	There is a structured process for developing and allocating annual budgets for the area There are adequate systems for financial management and control, record keeping and retrieval	+1 +1
11. Control over access /use for the protected area	Protection systems is effective due to the presence of RNA	3
12. Resident communities and/ or traditional landowners	BZ management committees are empowered through the Legislation to make decision and implementation of ICDP	3
Additional points	Various income generating activities are implemented by the BZ management committee for the local people	+1

	Thatch grass are allowed to be collected by the local people every year	+1
13. Visitor opportunities	Adequate facilities and services provided by the concessionaires and other hoteliers Policy to encourage the private entrepreneurs to implement tourism activities is promoted	3 +1
14. Visitors	Visitor facilities and services are adequate	3
15. Commercial tourism	Commercial eco-tourism without compromising the conservation values is promoted	3
16. Management intervention	Management interventions required to maintain protected area resources are known but are not being fully implemented	2
17. Control of land uses and activities	With the introduction of BZ regulation land use planning in BZ are effectively implemented	3
18. Sustainable production	Production activities in the area are being conducted in a wholly sustainable manner	3
19. Regional and national development	Production activities in the area are contributing significantly to national development	3

Process Assessment Summary Table

Main Issues	Maximum score	Current score	Effectiveness (percentage)
Legislation	3	3	100%
Law enforcement	3	3	100%
Planning	6	5	83.3%
Resource inventory	3	3	100%
Resource management	3	3	100%
Maintenance	3	1	33.3%
Neighbors	5	5	100%
Economics benefits to local communities	4	4	100%
Communication	3	3	100%
Management system	5	5	100%
Control over access/use of the protected area	3	3	100%
Resident communities and/or traditional landowners	5	5	100%
Visitors opportunities	4	4	100%
Visitors	3	3	100%
Commercial tourism	3	3	100%
Management intervention	3	2	66.6%
Control of land uses and activities	3	3	100%
Sustainable production	3	3	100%
Regional and national development	3	3	100%
Total	**68**	**64**	**94.12%**

5.0 OUTPUT ASSESSMENT

5.1 Management Plan Implementation Assessment

Current system of assessing implementation of Management Plan

Assessment of the management plan is being done by the Ministry and departments in the regional planning workshops. MIS has been developed by DNPWC and is being in the process of implementation. It is difficult to implement the current Management Plan due to shortage in financial resources. The management actions are grouped as below:

1. Park Management:

i. Management Zones
ii. Grassland Habitat Conservation
iii. Wetland Habitat Conservation
iv. Forest Habitat Conservation
v. Wildlife Species Conservation
vi. Cultural Heritage Conservation
vii. Tourism Management
viii. Conservation Education
ix. Resource Sharing and Access
x. Law Enforcement
xi. Institutional Strengthening
xii. Hattisar Management
xiii. Physical Infrastructure
xiv. Coordination, Cooperation and Inter-sectoral linkages

xv. Research and Development
xvi. Monitoring and Evaluation system

2. Buffer zone Management

i. Management Zones
ii. Grassland and Fodder Management
iii. Wetland Management
iv. Forest Management
v. Soil and Water Management
vi. Wildlife Conservation
vii. Cultural Heritage Conservation
viii. Tourism Management
ix. Conservation Education
x. Alternative Energy Development Technology
xi. Social and Economic Development
xii. Gender Mainstreaming
xiii. Special Target Group support
xiv. Institutional Development
xv. Inter-sectoral Linkage
xvi. Research and Development
xvii. Monitoring and Evaluation System

The first BZ management committed completed its five years tenure. New buffer zone management committee has been formed. We are in the process of evaluating the overall impact of BZ programs.

Summary Assessment of Current Management Plan Implementation (Park)

Criteria: 1. Park Management	Score action wise	Max score	Current score	Percentage
Management Zones (3 actions)	2,4,2	12	8	67%
Grassland and Fodder Management (11 actions)	4,2,2,4,3,4,4,4,3,3,4	44	37	84%
Wetland Habitat Conservation (16 actions)	3,4,2,2,4,1,4,2,2,1,4,4,4,2,2,4	64	45	70%
Forest Habitat Conservation (9 actions)	3,4,3,2,4,4,3,2,1	36	26	72%
Wildlife Species Conservation (9 actions)	3,2,3,4,4,4,4,4,4	36	32	89%
Cultural Heritage Conservation (9 actions)	4,3,3,3,2,1,4,0,2	36	22	61%
Tourism Management (18 actions)	3,3,3,0,2,1,4,3,0,3,4,4,2,2,4,4,3,1	72	46	64%
Conservation Education (13 actions)	2,3,3,4,2,2,4,3,1,1,1,4,3	52	33	63%
Resource Sharing and Access (7 actions)	2,1,4,4,3,4,4	28	22	79%
Law Enforcement (10 actions)	1,1,4,4,4,2,3,4,4,3	40	30	75%
Institutional Strengthening (24 actions)	3,2,3,2,4,2,1,3,2,1,1,2,3,1,1,0,4,4,3,4,3,3,2,0	96	54	56%
Hattisar Management (30 actions)	2,3,3,4,1,4,3,1,1,1,3,1,1,3,2,3,2,2,2,1,4,3,4,4,0,3,0,2,4,4	120	71	59%
Physical Infrastructure (39 actions)	2,3,3,2,2,0,4,2,4,2,3,3,2,2,3,2,4,2,1,4,4,2,0,1,2,2,3,0,3, 3,4,3,4,4,3,3,3,3,3	156	100	64%
Coordination, Cooperation and Inter-sectoral linkages (10 actions)	4,4,4,4,4,4,3,3,4,4	40	38	95%
Research and Development (15 actions)	2,2,1,3,1,2,1,1,1,2,3,2,4,3,2	60	30	50%
Monitoring and Evaluation system (10 actions)	3,2,1,0,2,NR,0,3,2,NR	32	15	47%

Summary Assessment of Current Management Plan Implementation (Buffer Zone)

Criteria: 2 Buffer Zone Management	Score action wise	Max score	Current score	Percentage
Management Zones (6 actions)	4,2,2,4,3,2	24	17	70%
Grassland and Fodder Management (12 actions)	3,3,2,1,2,4,3,1,4,3,4,3	48	33	69%
Wetland Management (10 actions)	3,1,2,3,1,1,2,3,1,2	40	19	47%
Forest Management (15 actions)	3,3,2,1,2,2,4,3,4,4,4,1,3,4,4	60	44	73%
Soil and Water Management (10 actions)	4,3,4,3,4,2,3,1,1,4	40	29	73%
Wildlife Conservation (13 actions)	4,3,0,3,3,3,3,3,2,1,1,3,3	52	32	62%
Cultural Heritage Conservation (10 actions)	3,1,3,3,1,2,3,1,1,3	40	21	53%
Tourism Management (14 actions)	4,3,2,3,3,2,1,3,2,3,4,3,3,2	56	38	68%
Conservation Education (24 actions)	3,1,3,4,4,4,3,3,4,3,3,2,4,3,3,2,3,4,4,4,3,1,3,4	96	75	78%
Alternative Energy Technology Development (6 actions)	3,4,3,1,3,1	24	15	63%
Social and Economic Development (14 actions)	4,2,4,3,1,3,2,3,3,4,3,3,1,3	56	39	70%
Gender mainstreaming (10 actions)	3,3,2,2,3,3,3,1,2,1	40	23	58%
Special Target Group support (11 actions)	4,3,2,3,3,2,2,3,3,4,3	44	32	73%
Institutional Development (15 actions)	4,4,4,4,3,4,1,2,2,4,4,0,4,3,4	60	47	78%
Inter-sectoral Linkage (7 actions)	4,3,4,3,3,3,3	28	23	82%
Research and Development (8 actions)	1,3,3,4,2,2,4,3	32	22	69%
Monitoring and Evaluation System (11 actions)	3,2,1,4,3,3,3,3,4,3,4	44	33	75%

Status	**Ranking**	Work is only reactive	1
Action has been completed	4	Action not commenced	0
Action has made substantial Progress	3	Not Required	NR
Some work has commenced in all or some across	2	Not Applicable	NA

5.2 Work/Site Output Indicators

Planned activities are approved from the HMGN for the year 2002/2003. There is the monthly, trimestarly, half yearly, eight monthly and annual reporting system. The current and previous Chief Warden, Assistant Wardens, NGO partners were consulted for assessing management effectiveness. Some of the activities which are not reflected in Annual Work Plan are being implemented by (I)NGO partners.

Output Indicator Data Sheet (National Park)

Parameters	Planned	Actual achievement	Remarks
Conservation education			
Public Co-ordination workshop/meetings	1	1	
School program	2	2	
Special days/events celebration	3	3	
Habitat conservation and improvement			
Grassland management	61 ha	61 ha	
Wetland management	3	3	15 ha wetlands (3 ox bow lakes) cleaned
Waterhole construction	1	1	
Fire control	1	1	15 Km of fire line maintained
Species conservation			
Captive breeding program of Crocodile	1	1	500 eggs are collected, 327 Gharial crocodile hatchlings raised
Turtle conservation	1	1	57 turtles belonging to 7 species raised in breeding center
Endangered bird monitoring	1	1	Study of Bengal Florican
Rhino translocation	1	1	10 individuals (6 F+4 M) translocated
Elephant breeding program	1	1	1 new baby born
Orphan Rhino Baby	--	2	
Orphan wildlife conservation	--	1	1 orphan leopard
Problem animal management	--	17	1 Sloth Bear, 1 Tiger,1 leopard, 3 mugger

Parameters	Planned	Actual achievement	Remarks
			crocodile, 1 dolphin, 10 python translocated from conflict area to the core area
Physical infrastructures			
Forest road maintenance	110 Kms	110 Kms	
Drinking water facility improvement	4	4	
Boat maintenance/construction	2	3	2 boats repaired and one constructed
Watch tower maintenance	1	1	
Wooden bridge maintenance	5	5	
Building construction	2	1	Not sufficient budget to construct other building
Building improvement	18	18	
Repeater & repeater tower maintenance	1	1	
Visitor center improvement	2	2	
Research and Development			
GIS database system establishment in Kasara and Sauraha	2	2	Recently initiated
Annual Report Publication	1	1	
Research grants for University students.	6	6	
Research on endangered animals	3	3	1 in Rhino, 1 in Tiger and 1 in endangered birds
Study of biomass production in grassland	1	1	
Study small mammals, micro-flora and fauna.	3	3	Focused on Buffer zone area

Output Indicator Data Sheet (Buffer zone)

Parameter	Planned	Actual achievement	Remarks
Conservation program	190*	190*	Plantation, fencing, check dam construction, community forest management etc.
Community development program	250*	250*	Road maintaince/construction, School construction, Drinking water, Irrigation, Community building construction, Healthpost construction etc.
Income generation & skill development program	120*	120*	Bee keeping, handicraft, fish/poultry farming, sweing & tailoring, skill enhancement training etc.
Conservation education program	135*	135	Workshops/interaction program, Essay/song competition, Awareness program, special day celebration etc.
Compensation and relief program	NA	NA	Program is going on for wildlife victims. Compensation mechanism for crop depredation and flood victims are in process.

* Approximate data.

6.0 OUTCOMES ASSESSMENT

6.1 Biodiversity Health Assessment

Scientific evaluation of biodiversity health status incorporates at least three components. They are diversity index, habitat condition, and species used by the resident. Diversity versus habitat condition, advance genetic tools, quantification of invertebrates, non-flowering plants, micro-organisms including pathogens and assessment of micro-organism diversity has not been considered during this evaluation.

Rapid habitat assessment tools has been used to study habitat status.

GAPS

- Inadequate information about ecological processes and parameters.
- Lack of trained park personnel for monitoring indicators and their measurements.

RECOMMENDATIONS

- Organize and conduct appropriate scientific research and establish database center for enhancing formal long-term monitoring.
- Train park staff in research and monitoring.

Biodiversity Health Outcomes Data Sheets

Focal Management Target: Maintenance of Natural Ecosytems of RCNP

	Key factor	**[Acceptable Range of Variation or Acceptable State (describe)]** **Indicators of key changes to the Focal Management Target**	**Monitoring Indicator Used for Measurement**	**Within its acceptable range of Variation? (y/n)**	**Restorable? (y/n)**	**Meets preferred status? (y/n)**	**Overall Biodiversity Health Rank**
Size	Number of species (their abundance level) Grassland area Number of wetlands Number of aquatic fauna	50 species of mammals, 526 species of birds (and above). 5521 ha grassland in core area (and above). 40 oxbow lakes (and above). 32930 ha (and above) of forest area in the buffer zone.	No. of species. Area of grassland (GIS) No. of lakes. Areas dominated by wild species. Area of forests in the buffer zone. Water quality.	Yes	Y	Yes	Very Good
Landscape	Climate regime Corridor and connectivity	2000 –2100 mm of annual rainfall At least 1500 sq km of core habitat connected by two feasible corridors	Meteorological data GIS mapping, field observation	Yes	Y	Yes	Very Good

	Key factor	[Acceptable Range of Variation or Acceptable State (describe)] Indicators of key changes to the Focal Management Target	Monitoring Indicator Used for Measurement	Within its acceptable range of Variation? (y/n)	Restorable? (y/n)	Meets preferred status? (y/n)	Overall Biodiversity Health Rank
Condition	Structure of rhino population	At least 2 calves with adult female	Population status survey	Y	Y	Y	Very Good
	Level of tiger predation	At least 2 adult tigers per 100 sq km	Camera trap survey	Y	Y	Y	Very Good
	Status of gharial population	Male / Female composition maintained at 1:4 ratio	Population census	N	Y	N	Fair

Monitoring Plan Template

Focal Management Target	Indicator to be Measured	Key Factor / Biodiversity Health Category Informed	Methods to be Employed	Frequency	Timing	Who will Measure	Cost	Funding Source
Maintenance of natural ecosystems of RCNP	No. of species	Species abundance	Direct count	Annually	Except monsoon season	Park staff & and related NGOs	NA	Government and conservation partners
	Grassland area	Biomass	Sample plots	Annually	-do-	-do-	-do-	-do-
	No. of lake	Size of lake	Survey	-do-	-do-	Park administration & Researchers	-do-	-do-
	Areas dominated by wild species	Species composition	Survey	Once a year	-do-	Park staff	-do-	-do-
	Area of forests in the buffer zone	Canopy cover, ground cover, size of the forest area	-do-	-do-	-do	Park staffs & buffer zone committee	-do-	-do
	Water quality	Pollution level	Water quality monitoring	-do-	-do-	Parks staffs, conservation partner, buffer zone committee	-do-	-do-

Focal Management Target	Indicator to be Measured	Key Factor / Biodiversity Health Category Informed	Methods to be Employed	Frequency	Timing	Who will Measure	Cost	Funding Source
Rare and endangered species conservation	Population status Rhino Tiger Gharial	 250 sub-adult Rhinos At least 60 breeding tigers Sighing frequency increased	Survey	 Every five years Every year Quarterly	Except monsoon	Park staff and conservation partners	-do-	-do-

6.2 Assessment of Threat Status

Stress and threats are those factor that adversely effect the ecological characteristics of the area and interface with conservation of biodiversity. The identified stresses are:

1. Soil erosion
2. Flooding
3. Plant succession and invasion of alien species
4. Wildlife poaching
5. Industrial pollution
6. Livestock and crop depredation

Potential threats are

1. Infrastructure development
2. Unregulated tourism

Ranking Stresses and Sources of Stresses data. SHEET 1

FMT: Maintenance of natural ecosystems of RCNP

	Stress1 Alteration of habitat due to soil erosion and flood		**Stress 2 Reduction in habitat availability**		**Stress 3 Contamination of water bodies**		**Stress 4 Decrease in wildlife population**		**Stress 5 Change in wildlife behavior**		**Stress 6 Rising antagonism of local community towards park**		**Stress 7 Habitat disturbance and loss**		**Overall threat to target rank**
Stress Rank	**Rank: Low**		**Rank: Low**		**Rank: High**		**Rank: Low**		**Low**		**Medium**		**Low**		
Source of Stress	Source contribution Rank	Stress source rank	Source contribution rank	Stress source rank	Source contribution rank	Stress source rank	Source contribution rank	Stress source rank	Source contribution rank	Stress source rank	Source contribution rank	Stress source rank	Source contribution rank	Stress source rank	
Source 1 Improper management of watershed	Moderate	Nil	Moderate	Nil	Moderate	Nil	Low	Nil	Nil	Nil	Moderate	Nil	Moderate	Nil	Low
Source 2 Change in microclimatic condition	Moderate	Nil	Low	Nil	Nil	Nil	Low	Nil	Low	Nil	Nil	Nil	Low	Nil	Low
Source 3 Industrial pollution and intensive agriculture	Nil	Nil	Moderate	Nil	Very High	Low	High	Nil	Moderate	Low	Nil	Nil	High	Nil	Mod-erate
Source 4 Wildlife poaching	Nil	Low	Nil	High	Nil	Mod-erate	Very high	Low	Nil	Low	Nil	High	Moderate	Mod-erate	Mod-erate
Source 5 Unregulated tourism	Low	Nil	Low	Nil	High	Nil	Low	Nil	Moderate	Nil	Low	Nil	High	Nil	Nil
Source 6 Livestock and crop depredation	Nil	Mod-erate	Nil	High	Nil	Nil	Moderate	Low	Nil	High	Very high	Nil	Nil	High	Mod-erate
Source 7 Infrastructure development projects	High	Nil	High	Nil	Moderate	Nil	Moderate	Nil	Low	Nil	Nil	Mod-erate	Very High	Nil	Mod-erate

Ranking Stresses and Sources of Stresses data. SHEET 2

FMT: Eco-tourism

	Stress1 Change in Wildlife behavior		**Stress 2 Cultural Change**		**Overall threat to target rank**
Stress Rank	**Moderate**		**High**		
Source of Stress					
Source 1 Unregulated tourism	High	Nil	High	Moderate	Moderate

Current Threat-to-Target Summary Table

Sources of Current Threats	Natural ecosystem	Critical habitat management	Eco-tourism	Buffer zone	Overall Threat Rank to Targets and Site
Improper management of upper catchments	High	Moderate	Low	Moderate	Moderate
Change in microclimatic condition	High	High	Low	Low	Moderate
Industrial pollution	High	Very high	Low	Low	Moderate
Wildlife poaching	Moderate	Moderate	Moderate	Low	Moderate
Livestock & crop depredation	Low	Low	None	Very high	Moderate
	Moderate	High	Low	None	Moderate

Identification and Ranking of Potential Threats Worksheet

	FMT: Ecosystem	**FMT: Critical habitat**	**FMT: Eco-tourism**	**FMT: Buffer zone**
Potential threat	**Rank**	**Rank**	**Rank**	**Rank**
Infrastructure development	Moderate	High	Low	None
Unregulated tourism	Moderate	High	Moderate	None

6.3 Achievement of Management Objectives

Planned objectives : Ecosystem of RCNP enhanced in a sustainable way

Overall Goal Ecosystem of RCNP enhanced in sustainable way	Objectively Verifiable Indicators • Rhino, spotted deer, wild boar coming out to crop-field is decreased by 50%by the end of plan period • Tiger population is increased from 107 (1998) to 117 by the end of five year (2006) • Rhino population maintained by translocation 20 rhinos in RBNP and RSWR	Means of Verification • Census Report • Office Report	Assumptions • Cooperation of other agencies and people is achieved and continued • No big calamities will happen
Purpose Biodiversity of RCNP conserved sufficiently	Objectively Verifiable Indicators • By the end of five years, migratory bird sighting started which have not been seen since last few years • Population of endangered birds (Bengal florican, lesser florican, giant hornbill, black stork, white stork) increased by 10% at the end of 5 years • Poaching of rhino and tiger is reduced by 75% at the end of 5 years • Density of *Cythea spinosa, Rauwolfia serpentina, Cycas pectinata*, orchids increased by 10% at the end of 5 years	Means of Verification • Field Research Report • Office record • Bird inventory data	Assumptions • People cooperation is available • BZ development have positive impact on conservation
Result/Output 1. Zoning and land use plan prepared 2. Grassland managed 3. Wetland conserved 4. Flooding and river pollution reduced 5. Forest fire controlled 6. Forest resources developed in BZ area 7. Species conservation strengthened	Objectively Verifiable Indicators (attainable at the end of 5 years plan period unless otherwise stated) 1.1 Management zonation in park and BZ clearly demarcated 1.2 Zone maps and land use plans are published and available 2.1 Area of short grassland increased and invasive species are controlled in grassland 2.2 Management of 6000 ha grasslands result in 5-10% increase in herbivore population 2.3 Incidence of crop damage reduced by 50% 2.4 Number of feral livestock decreased by 25% and stall feeding practiced by 50% of the households 3.1 Water hyacinth are controlled in wetlands 3.2 Water level in water bodies is not reduced as of current levels 3.3 Number of migratory birds and aquatic species diversity increased by 5-10% in wetlands 4.1 At least 15 km embankments established to control drastic flooding 4.2 Density of Gharial and diversity of fish increased by 10% in Rapti, Reu and Narayani rivers 5.1 Six fully equipped fire fighting teams are functional 5.2 At least 25 km additional fire-line in the forests established 5.3 Forest fire incidence reduced by al least 75% 6.1 Fifty private forest and 70 community forest are registered 6.2 At least 50% of BZ household became self-sufficient in fuel-wood, fodder and other forest product 6.3 Plantation of MPTS in farm bonds (agro-forestry) are observed in 25% farm households 7.1 Species action plans of 6 endangered species implemented 7.2 Endangered species revived and their population increased by 5-10% 7.3 Translocated and captive breed released population of endangered species population increased by 5-10%	Means of Verification • Office Record • Periodic progress report • Field Evaluation report • Socio-economic survey • Research & Monitoring report • Record of Wildlife offences • Record of illegal offences • Census record • Notification in Gazettes • Record of number of hotels in BZ • Entry permits given to tourists • Water quality monitoring data • Aquatic life study data	Assumptions • Govt approves land-use planning of RCNP • Support from the livestock grazers is achieved • Donor support is achieved • People accepted the program • Local people support and contribute up to 50% cost sharing • Peace and security in the country maintained • Govt approves tourism plan and code of conduct • Tourist facilities and services increased • Concerned industries have positive attitude • Subsidy policy on alternative energy technology continue

8. Tourism managed	8.1 Visitors in Sauraha kept below 75,000 per year as of year 2000 based on its carrying capacity 8.2 Eleven new eco-tourism sites developed in BZ like Bagmara to attract 100,000 tourists per year 8.3 At least 4 model eco-tourism villages with ethnographic museums developed and garbage disposal system well managed		
9. Resource/Information centers established	9.1 Number of visitors in information center increased 9.2 Public support, such as information on poaching, forest fire, etc for park management increased five times		
10. Conservation education enhanced	10.1 Effective audio-visual aids are available for awareness raising 10.2 Seventy five percent BZ high school students have knowledge on conservation 10.3 At least 400 trained local people available as Adult and Child Literacy facilitators 10.4 Youth group stopped killing birds by catapult (Guleli) in jungle		
11. Resource sharing and access regulated	11.1 Extraction area and amount for sand, gravel, stone is fixed 11.2 Sector wise thatch and grass collection on rotational basis started 11.3 Number and speed of vehicles on right-of-way fixed		
12. Alternate energy sources developed	12.1 Fuel-wood consumption in BZ area reduced by 50 percent 12.2 Twenty five percent household started using alternate energy sources 12.3 At least 1000 biogas plants and 2500 ICS installed through subsidy		
13. Social mobilization effectively done	13.1 At least 90% HH became member of UGs and 50% HHs organize into various functional organizations 13.2 Women and special target group represent in the UC and BZDC 13.3 At least 1350 STG children receive scholarship for attending school		
14. Income generating opportunities created	14.1 At least 400 various skill development training conducted 14.2 At least 10% HHs initiated micro enterprise and 50% of them enhanced income by 50% 14.3 BZ community mobilized at least Rs. 5 million group savings every year 14.4 At least one hundred cooperatives established		
15. Loss caused by wildlife reduced considerably	15.1 About 300 ha herbal plantations established that are unpalatable to wildlife 15.2 Cope and livestock depredation and human casualty by wildlife reduced by 30%		
16. Sustainable human resource developed	16.1 Wardens, Asst Wardens, Rangers, senior game scouts and game scouts trained on conservation and community development 16.2 Chairperson and Secretary of 1500 UG and 37 UC developed leadership and management skill 16.3 At least 1000 local people trained with specialized skill 16.4 UG, UC and BZDC is self-managed and institutionalized		
17. Hattisar strengthened	17.1 Two staff quarters and 30 elephant shades with fences are constructed 17.2 Number of new born elephants increase at the rate of 2 every year		
18. Law enforcement & anti -poaching unit strengthened	18.1 Security posts are reviewed and relocated at strategic points 18.2 APUs are well equipped resulting in 75% reduction in poaching by five years 18.3 Amended RCNP Regulation 2030 (1974) will be published		

19. Patrolling effectively conducted	19.1 Offences of illegal activities (grazing and collection of firewood and NTFPs) reduced by 50%		
20. Coordination among stakeholders ensured	20.1 Attendance of concerned agencies in meetings and workshops is 90% 20.2 Coordination meetings are held regularly on schedule 20.3 Conflict between concerned agencies are minimized 20.4 About 50% activities are conducted through inter-sectoral support in 5 years 20.5 Local politicians take interest and participate in conservation functions		
21. Monitoring and research system established	21.1 Management Information System (MIS) established 21.2 Grassland, sal-forest, and riverine forest biodiversity inventory completed 21.3 Library established in RCNP, Kasara and BCC, Sauraha with regular publications 21.4 Research journal one and three bulletins are published annually at park and buffer zone levels		

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Contact : Marc Hockings. School of Natural and Rural Systems Management ,
The University of Queensland, Gatton Campus, 4343 Queensland, Australia.
Tel. : +61 7 5460 1140, Fax: +61 7 5460 1324, Email: m.hockings@mailbox.uq.edu.au
Dr. V.B. Mathur, Professor & Head and Project Coordinator
WII-UNESCO Project, Wildlife Institute of India
Chandrabani, Dehradun – 248 001
Tel.: +91-135-2640990, Ext. 202, Fax : +91-135-2640117, Email: vbm@wii.gov.in