KRISHNASAAR CONSERVATION AREA
MANAGEMENT PLAN
(2074/75-2078/79)

Government of Nepal
Ministry of Forests and Environment
Department of National Parks and Wildlife Conservation

KRISHNASAAR CONSERVATION AREA OFFICE

Khairapur, Bardiya, Nepal

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Ministry of Forests and Environment

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Government of Nepal
Ministry of Forest and Environment
Department of National Parks & Wildlife Conservation

Date : June 13, 2018

FOREWORD

The Blackbuck (*Antelope cervicapra)* of Khairapur was the last remaining population of the wildlife species in Nepal until 28 blackbucks were translocated to Hirapur Phanta of Shuklaphanta National Park in 2012. Several attempts have been made to protect this species, which range from translocation of the species to other suitable sites within Nepal to acquisition of private land and declaration and establishment of Krishnasaar Conservation Area (KrCA); and from the formation of Conservation Area Committees and KrCA Management Council to conduct various research studies. Despite the conservation success following the said initiatives, the issues relating to illegal settlers in *ailani* land (unregistered cultivated land) have yet to be resolved because of which blackbuck habitat has shrunk. In this context, a comprehensive management plan for KrCA is crucial in addressing emerging issues and challenges. In this sense this management plan is the first of its kind to try to identify and address the issues associated with the long-term conservation of blackbuck and its habitat.

The present Management Plan for Krishnasaar Conservation Area 2074/75-2078/79 (2017-2021) is the outcome of a rigorous field exercise done by a management plan preparation and vulnerability assessment team. The preparation process also involved an intensive literature review together with consultation with the stakeholders and review by experts.

I would like to extend my sincere thanks to the reviewers of this plan who provided valuable inputs during its preparation. Mr. Purushottam Sharma, Conservation Officer, KrCA, deserves special appreciation for his tireless effort in leading the process about the preparation of this plan. I would like to thank DNPWC officials, especially Deputy Director Generals Mr. Gopal Prakash Bhattarai and Mr. Sher Singh Thagunna, for their contribution for the preparation of this plan. Mr. Shyam Bajimaya, Ex Director General of DNPWC deserves special thanks for his generous time in reviewing this plan. I also take this opportunity to thank WWF Nepal for the partial funding support it provided through the TAL Program for this endeavor. Similarly, thanks are also due to USAID funded Hariyo Ban Program for undertaking climate change vulnerability assessment and support for publication. Finally, I would like to thank all the individuals and organizations, who extended their support and cooperation to produce this plan.

I am confident that this plan will be helpful in paving the way to maintain a viable population of blackbuck in the Conservation Area. At this juncture, I would like to request all the concerned stakeholders in joining hands in translating the vision of this plan into meaningful action.

Man Bahadur Khadka
Director General

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खैरापुर, बर्दिया

☎ : ०८४-४१२००७
☎ : ०८४-४१२००८

पत्र संख्या :-
चलानी नं. :-

मिति :

ACKNOWLEDGEMENTS

Krishnasaar Conservation Area was established in Khairapur of Bardia District in 2009 in order to conserve blackbuck. In order to institutionalize the ongoing efforts to conserve this rare species in a human-dominated landscape, there is an urgent need of a comprehansive management plan. In an attempt to fill this gap, we have come up with a plan prepared by a team through a consultative process at various levels. Finally, for the first time, we have been able to develop a complete plan for KrCA with the continued support and cooperation of various individuals and organizations during the entire planning process.

In this light, I would like to express my sincere gratitude to Director General of DNPWC Mr. Man Bahadur Khadka, for entrusting me to lead the plan preparation team to prepare the management plan of KrCA and for his continuous support and encouragement throughout the planning process. Similarly, I wish to express my gratitude to Deputy Director Generals Mr. Gopal Prakash Bhattarai and Mr. Sher Singh Thagunna for their constant support, guidance and critical review in finalizing the present plan. Likewise, I am indebted to Mr. Shyam Bajimaya, reviewer and former DG of DNPWC for his constructive comments and feedback. I extend special gratitude to Mr. Narayan Rupakheti, Management Officer DNPWC for his contribution to the process. Similarly, I thank Mr. Bishnu Prasad Thapaliya, Assistant Management Officer, DNPWC for providing constant support throughout the planning process. I would also like to acknowledge Mrs. Saraswoti Sapkota, Assistant Planning Officer, for her inputs as a member of the plan preparation team. Mr. Santosh Kumar Bhagat, Ranger, from the Management Section of DNPWC also deserves appreciation. Moreover, I have a deep sense of gratitude to all other senior staff at DNPWC and experts from partner organizations such as WWF Nepal, NTNC, ZSL and BCN for their invaluable comments and suggestions in finalizing this plan.

Likewise, I would like to thank all the respondents who contributed to the planning process through field level consultative meetings. I am also grateful to the User Committee members who actively participated in and contributed to the preparation of this plan. I would like to thank all the council members including Mr. Krishna Prasad Khanal, Chairperson, Mr. Tanka Prasad Adhikari and former Chairperson Mr. Mulchandra Yadav. I am thankful to Mr. Krishna Prasad Basyal from Integrated Conservation and Development Centre (ICDC) for his continued support to KrCA. Moreover, I would like to acknowledge Dr. Shant Raj Jnawali, Chief of Party of the USAID funded Hariyo Ban Program, and Mr. Dipesh Joshi, Senior Programme Officer WWF Nepal, for conducting climate vulnerability assessment of KrCA and integrating it in the management plan. I also take this opportunity to thank Mr. Shiv Raj Bhatta, Director- Field an Programs WWF Nepal for his valuable guidance during the planning process. Moreover, I would like to appreciate the contribution and untiring efforts of our team members including Mr. Saurav Shrestha and Mr. Tika Ram Poudel of SDIC during the preparation process, which included field level interactions, data analysis, drafting and finalization of the plan. Likewise, Mr. Bhola Nath Dhakal deserves thanks for preparing maps for the document.

Finally, I would like to thank all the staffs of KrCA, who were instrumental and supportive in the process of preparation of this plan.

Purushottam Sharma
Conservation Officer

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(..... शाखा)
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संकेत नं. :-
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विषय :- कृष्णसार संरक्षण क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०७४।७५-२०७८।७९) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) स्वीकृत गरिएको सम्बन्धमा ।

श्री कृष्णसार संरक्षण क्षेत्र कार्यालय
खैरापुर, बर्दिया

प्रस्तुत विषयमा कृष्णसार संरक्षण क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०७४।७५-२०७८।७९) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) स्वीकृतिको लागि त्यस कार्यालयको पत्र संख्या २०७३।७४ मिति २०७४।३।२२ को टिप्पणी सहितको फाईल पेश हुन आएको ।

उल्लिखित फाईल उपर कारवाही हुँदा **"स्वीकृत व्यवस्थापन योजनालाई नेपाली भाषामा अनुवाद गरी अंग्रेजी र नेपाली दुवै भाषाको योजनालाई छापेर सरोकारवालालाई वितरण गर्ने"** गरी कृष्णसार संरक्षण क्षेत्रको पञ्चवर्षिय व्यवस्थापन योजना (२०७४।७५-२०७८।७९) र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन (IEE) मिति २०७४।८।२२ को विभागीय निर्णयानुसार स्वीकृत गरिएको हुँदा स्वीकृत व्यवस्थापन योजना र सो को प्रारम्भिक वातावरणीय परीक्षण प्रतिवेदन यसैसाथ राखी कार्यान्वयनको लागि पठाईएको व्यहोरा निर्णयानुसार अनुरोध छ ।

२०७४।९।२४
(विष्णु प्रसाद थपलिया)
सहायक व्यवस्थापन अधिकृत

Executive Summary

Blackbuck (*Antelope cervicapra*) is a protected wildlife of Nepal and it is also listed in Appendix III of CITES. Locally known as "Krishnasaar" in Nepal, it is believed that Lord Krishna cared for this wildlife. Thus, blackbuck is considered a holy animal by the Hindus, especially by the Yadav community. Blackbuck was once a common wildlife throughout the Indian sub-continent. It was distributed throughout West Pakistan along the foothills of the Himalayas from Punjab (Pakistan) through Uttar Pradesh (India) and Nepal to West Bengal (India) and Bangladesh (Lydekker 1924 cited in Chand 1999). In Nepal, blackbucks were once commonly found in western Terai regions of Kanchanpur, Bardiya and Banke districts in the 1960s (Pradhan et al. 1999). Then the wildlife species was considered to be extinct in the country. However, in 1975, a few blackbucks were sighted by Krishna Man Shrestha (then warden of Royal Karnali Wildlife Reserve) and Eric Dinerstein in Khairapur of Bardiya district of Nepal. Afterwards, with the joint effort of Department of Forests and Department of National Parks and Wildlife Conservation, five staff members were assigned to protect Krishnasaar and its habitat in Khairapur of Bardiya.

In the meantime, GoN made an attempt to establish another population of blackbuck in Nepal through translocation of the wildlife in Baghaura Phanta of Bardiya National Park. With the initiation of Central Zoo, blackbucks were translocated in 1977, 1985 and 1992. Altogether 46 blackbucks were translocated to Baghaura Phanta but this initiative proved unsuccessful because a monitoring conducted in 1993 failed to find even a single animal there. Then it was concluded that Khairapur was the only habitat where blackbuck could survive. In 1994, the Government made a decision to establish Krishnasaar Conservation Area (KrCA), covering 488 ha. of land consisting of 173 ha. of registered land, 105 ha. of *ailan*i (unregistered land) and 210 ha. of forest area.

Most of the current blackbuck habitat at Khairapur used to be private land and people had been living there since 1971. During 1994-1996, the Government took an initiative to acquire the private land by paying compensation to affected local inhabitants. It has already paid a sum of one crore eighty lakh Nepali Rupees (NRs. 1,80,00, 000) as compensation for acquisition of land. However, the issues relating to illegal settlers and encroachers in *ailani* land have not been solved due to political instability in the country. KrCA was declared in 2009 and an office was set up in 2010 at Khairapur. Similarly, KrCAMC was formed to increase people's participation in blackbuck conservation. Since then, KrCA has been protecting the wildlife species with the support from conservation communities. Resettlement program is still the prioritized activity of KrCA. Thus, this issue has been taken to the Ministry of Forests and Soil Conservation to be addressed at the Government level.

Translocation is essential to safeguard the population of blackbuck because Khairapur population is the source population of the wildlife species in Nepal. Khanal (2002) carried out an assessment of new translocation sites (Rauteli Bichuwa, Arjuni and Chaliaya Phanta) of Suklaphanta National Park (ShNP). Based on Khanal's study (2002), the translocation of several animals to Hirapur Phanta of ShNP was conducted in 2012 as part of an effort to establish a second viable population of blackbucks in Nepal.

Blackbuck primarily inhabits short grassland and prefers to graze selectively on short to mid-length grasses. It also prefers to eat crops. Blackbuck in KrCA had been grazing alongside local livestock since time immemorial. However, livestock grazing inside the blackbuck habitat has been

a problem as a huge number of livestock regularly graze inside KrCA. Likewise, the grassland has been intruded by various invasive species. In the aftermath of the floods of 2071, the intrusion of invasive species has increased. The invasive species, mainly consisting of *Ipomea*, has also been found to invade local wetlands which has affected blackbuck as well as migratory birds. There is an increase in the trend of tourists visiting KrCA, and, most of the tourists are Nepalese. Tourism infrastructure, however, is yet to be developed in order to provide service and facility to the visitors. In addition, KrCA should provide a platform for private entrepreneurs by creating a conducive environment for investment.

KrCA does not have an approved management plan yet, although a draft plan was already in place. This management plan has been prepared with the leadership of conservation officer of KrCA in accordance with the procedures prescribed by Protected Area Management Plan Preparation Guideline 2073. The management plan is organized in two parts viz. Part A: Existing Situation, and, part B: Proposed management. Part A comprises Background information, whereas Part B begins with Chapter four (describing vision, goal, objectives and major challenges) and ends with activities/log frame in Chapter eleven.

The activities are mainly centered on resettlement of illegal settlers or encroachers and habitat management. The activities relating to habitat management consist of grassland management, wetland management and controlling invasive species. Species conservation is another important activity which focuses in blackbuck conservation together with the protection of other associated wildlife species. The plan also focuses on tourism development since tourism at KrCA is at its early stage. The other areas of activities include institutional strengthening, community development outside the core area, conservation awareness, study and research, and office management. Altogether, Twenty-Two Crore Thirty-Two Lakhs Seventy-Six Thousand Nine Hundred Thirteen Rupees (NRs. 22,32,76,913) has been estimated for the endeavor, and focus is given to Habitat Management with a weightage of 20.10%. The Government has allocated 45.84% of the budget on the average, and the management plan envisages the need for partnership with partner conservation organizations to fill the gap of remaining 54.16% of the budget. Conservation User Committees should also need to seek budget from other line agencies and conservation partners for community development activities as the revenue generation of KrCA was only NRs. 70,650 in the fiscal year of 2073/74.

ACRONYMS

ATM	Automated Teller Machine
BNP	Bardiya National Park
CA	Conservation Area
CAUCs	Conservation Area User Committees
CBAPU	Community Based Anti-Poaching Unit
CBOs	Community-based Organizations
CC	Conservation Committee
CCA	Climate Change Adaptation
CCVA	Climate Change Vulnerability Assessments
CF	Community Forest
CFUG	Community Forest User Group
DCC	District Coordination Committee
DFO	District Forest Office
DLSO	District Livestock Service Office
DNPWC	Department of National Parks and Wildlife Conservation
DoF	Department of Forests
FOs,	Functional Organizations
GIS	Geographic Information System
GoN	Government of Nepal
GPS	Global Positioning System
HH	Household
IEC	Information Education and Communication
Km^2	Square Kilometer
KrCA	Krishnasaar Conservation Area
KrCAMC	Krishnasaar Conservation Area Management Council
MoFSC	Ministry of Forests and Soil Conservation
NGOs	Non-Governmental Organizations
PA	Protected Area
UC	User Committee
UG	User Group
VIC	Visitor Information Center

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PART A
THE EXISTING SITUATION

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CHAPTER

1 Introduction

1.1 Name, Location, Constitution and Extent

1.1.1 Name

Krishnasaar Conservation Area (KrCA)

1.1.2 Location

Krishnasaar Conservation Area (KrCA) is situated in Gulariya municipality of Bardiya district of western lowland Terai of Nepal (Figure 1). It lies between 28°7′ and 28°39′N latitude and 81°3′ to 81°4′E longitude. KrCA lies in between the old and new river course of Babai River and the headquarters of the Conservation Area (CA) is at Khairapur, Bardiya district– approximately 500 m north of Bhurigaon-Gulariya road.

1.1.3 Constitution and Extent

KrCA was established in 2009 with an area of 16.95 km^2 of Khairapur covering ward number 1, 2, 3 and 4 of Gulariya Municipality. Out of the total area, 5.27 km^2 is set aside as core area while 11.68 km^2 was considered as community development zone (Figure 2 below). The core area of

FIGURE 1: LOCATION MAP OF KrCA

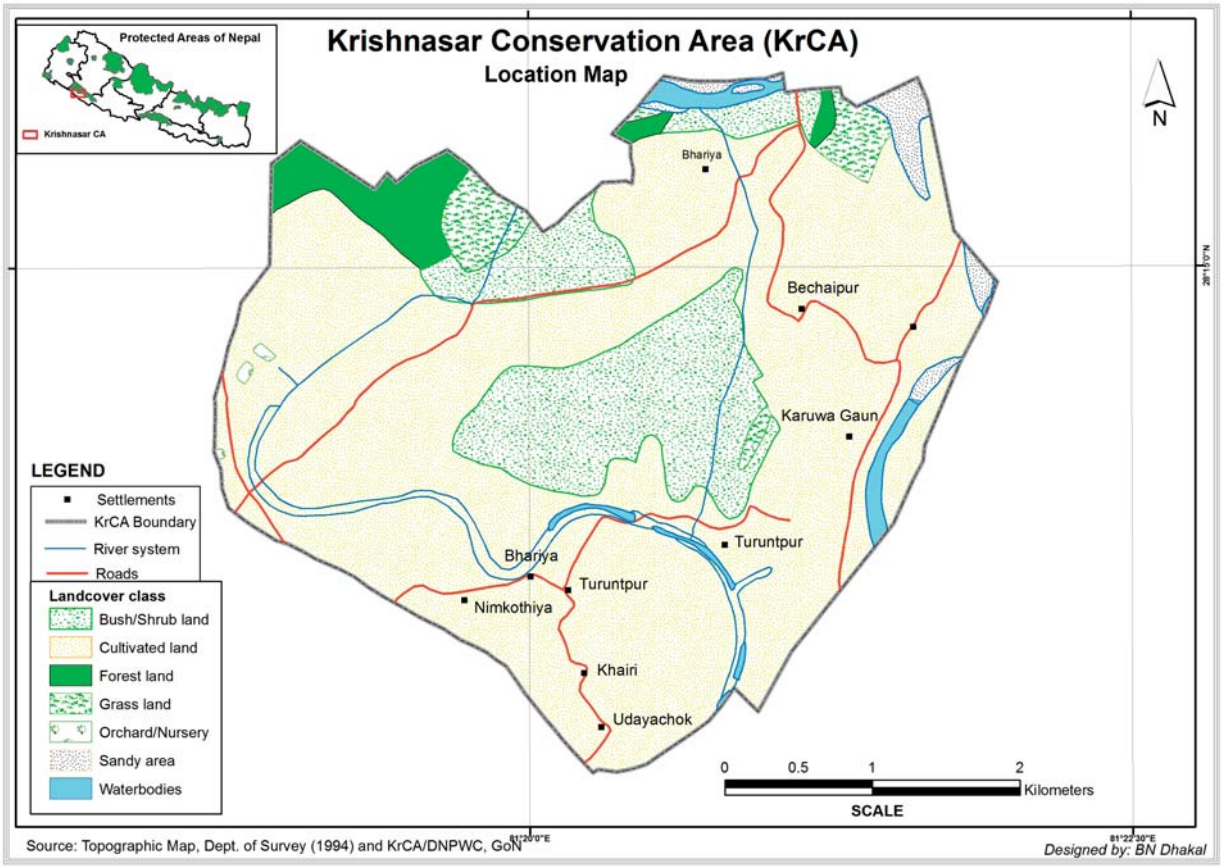
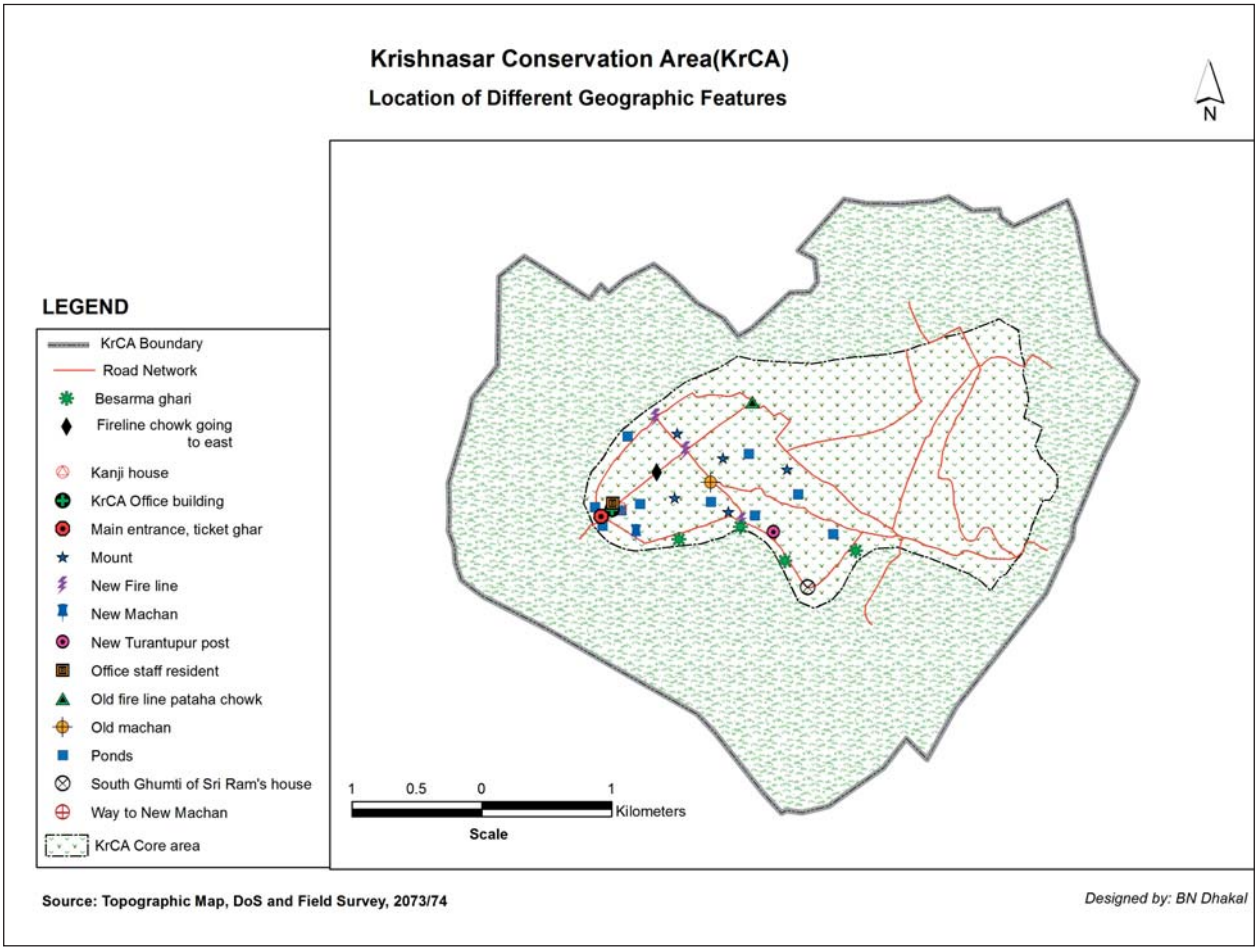


FIGURE 2: CORE AND COMMUNITY DEVELOPMENT AREA WITH KEY FEATURES OF KrCA



5.27 km^2 has further shrunk due to illegal settlers and encroachers (0.6 km^2). Thus, the core habitat available for the blackbuck at present is only 2.57 km^2 of grassland as there is a forest patch of 2.1 km^2.

The area mostly consists of marginal agricultural and grazing land and is bordered on three sides by the Babai river-bed, which is locally called *Sarju Nadi*. Apart from bordering the conservation area by it in the west, north and south, there is a scrub forest on the other side of it.

1.2 Access

KrCA is easily accessible by road from the nearest airport at Nepalgunj where there are several daily flights from Kathmandu. KrCA is 45 km away from Nepalgunj. There is a bus service from Nepalgunj to Gulariya, the headquarters of the Bardiya District. Khairapur lies at about 5 km north-west of Gulariya and about 42 km South-east of the headquarters of Bardiya National Park (BNP). Visitors travelling by bus from Kathmandu need to disembark at Khairapur, a small town along the Bhurigaon-Gulariya Road, and walk 500 meters on foot to reach the KrCA headquarters.

1.3 Statement of Significance

Blackbuck (*Antelope Cervicapra*), locally known as Krishnasaar, is a protected wildlife of Nepal and it is also listed in Appendix III of CITES. The blackbuck in KrCA survived from the verge of extinction due to conservation efforts in the last four decades. The blackbuck of Khairapur is the source population in the country. Several blackbucks had been translocated to Suklaphanta and BNP. However, the survival of the blackbuck in the translocated sites could not be ascertained as it is too early to confirm it. There is a possibility of growth in the number of blackbuck beyond the present number of 252 (as of Ashad 2073) after the issues relating to resettlement is resolved and the area of core habitat is further extended.

CHAPTER

2 Background Information and Attributes

2.1 Boundaries

2.1.1 Legal

KrCA was declared on Chaitra 03, 2065 (March 16, 2009) with an area of 16.95 km^2. This was duly notified in Nepal Gazette and the boundary of the conservation area was demarcated. The KrCA boundary is shown in Annex V.

2.1.2 Ecological

KrCA appears isolated and devoid of connectivity at present. However, after the resettlement issue relating to encroachers is resolved, it could be linked with BNP through the Babai River.

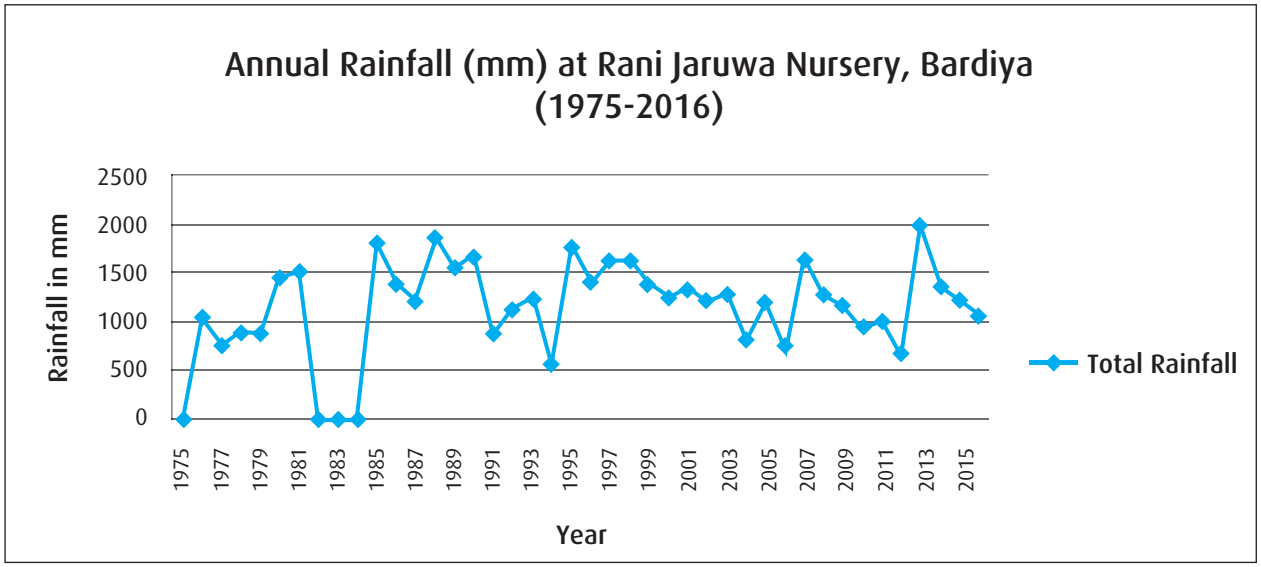
2.2 Geology and Soil

KrCA falls in the northern extension of the Gangetic plains. It contains older deposits of Gangetic alluvium consisting of beds of silt, clay, sand, pebble and gravel. Soils of the flat land are gently sloping and are generally well drained and quite deep. Brown or yellow brown sandy loam predominates in the area and is mostly calcareous and slightly alkaline in nature. It is very dry due to its slight slope with sandy and porous soil (Bolton, 1976). The sandy slopes are heavily leached, whereas the lowland plains are more fertile consisting of finer sand and clay loams (Wegge, 1991). The Siwalik range of north is of late tertiary origin and contains fine-grained sand stone with deposits of clay, shale, conglomerate and freshwater limestone (Tamang and Shrestha, 1998).

2.3 Topography and Drainage

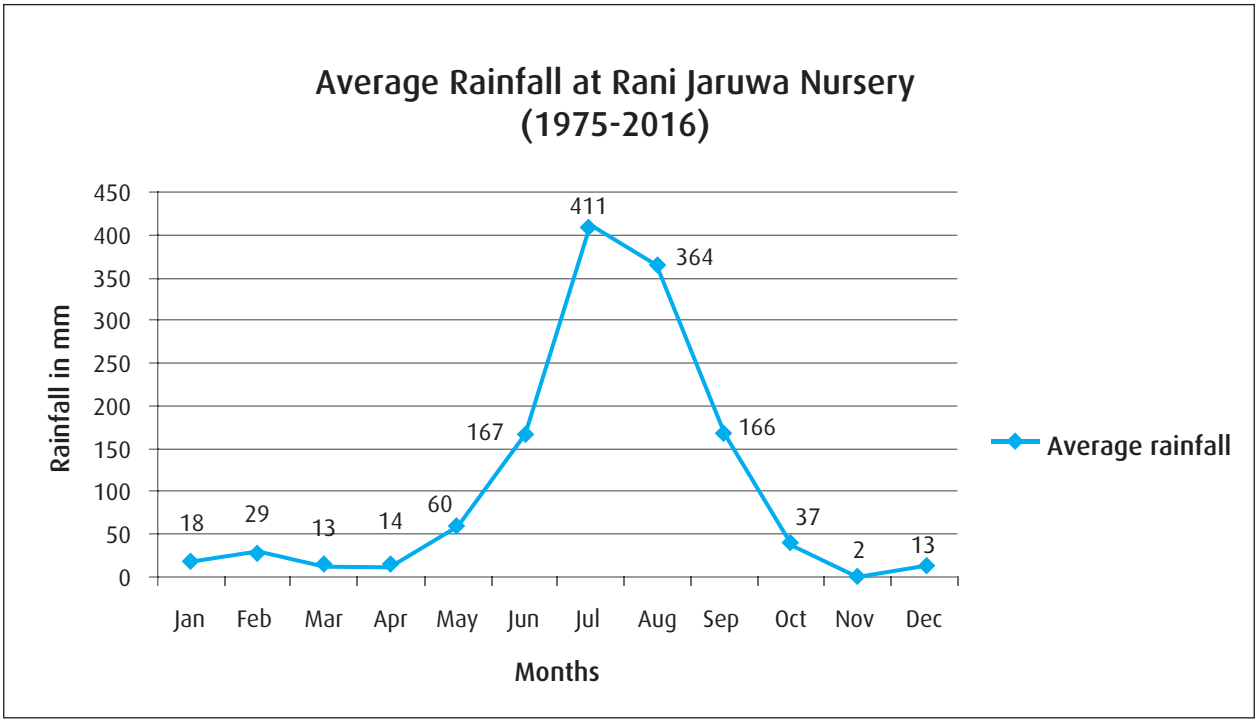
Topography of the area is flat with a gentle southward slope with an elevation ranging between 142 m to 152 m above mean sea level. The blackbuck habitat is situated at theox-bow bend of old Babai riverbed, locally known as Pataha phanta. It is adjoined by agricultural land in the west, south and north and by a Khair-Simal and scrub forest in the east. The old Babai riverbed, locally known as *Sarju nadi*, runs along the north, west and south boundary of the KrCA.

FIGURE 3: GRAPH SHOWING ANNUAL RAINFALL AT RANI JARUWA NURSERY (1975-2016), BARDIYA



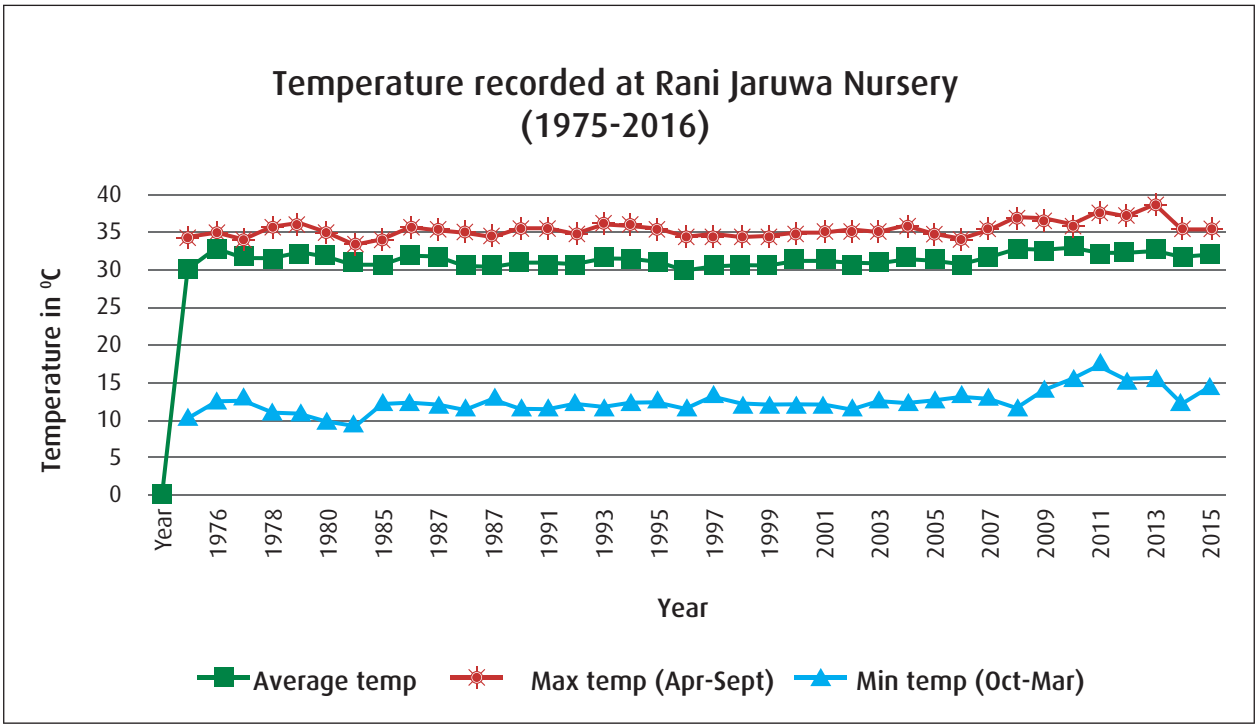
Source: Department of Hydrology and Meteorology, GoN, 2017

FIGURE 4: GRAPH SHOWING AVERAGE RAINFALL AT RANI JARUWA NURSERY, BARDIYA



Source: Department of Hydrology and Meteorology, GoN, 2017

FIGURE 5: GRAPH SHOWING MEAN ANNUAL MAXIMUM AND MINIMUM TEMPERATURE AT RANI JARUWA NURSERY, BARDIYA



Source: Department of Hydrology and Meteorology, GoN, 2017

2.4 Climate

KrCA has a tropical monsoon climate. The rain-bearing wind blows from the east and the western Terai generally receives less rain and tends to have a shorter monsoon, normally lasting from June to September. Three distinct seasons have been identified here: hot season (mid-Feb to mid-June), monsoon season (mid June to late Sept) and cool, dry season (Oct to mid-Feb). The mean annual rainfall and maximum and minimum temperature at Rani Jaruwa Nursery of Bardiya, as recorded (1975-2016) there is shown in Figure 3 and 4.

2.4.1 Rainfall Pattern

Mean annual rainfall during monsoon season (June-September) recorded at Rani Jaruwa Nursery from 1976 till 2016 is 1005 mm. Minimum rainfall was recorded in 1994 (568 mm) and maximum in 2013 (1988 mm).

2.4.2 Temperature

The average annual maximum and minimum temperatures recorded in 2004 were 30.8° C and 18.3° C, respectively (Figure 5)

2.4.3 Water Resources

The area is generally flat with a gentle slope towards the south. Stagnant water is available in the old riverbed of Babai River (*Sarju Nadi*) almost throughout the year. Many of the water bodies, however, dry up during summer (March-June). The Babai River forms the north and eastern boundary of KrCA km^2 east of the KrCA (Figure 1 in preeceeding chapter).

2.5 Biodiversity Status

2.5.1 Flora

There are two types of forests within blackbuck habitat, i.e. natural and planted forest. Natural forest is dominated by Simal-Khair (*Bombax ceiba- Acacia catechu*) and planted forest is dominated by Sissoo (*Dalbergia sissoo*). In total, 109 species of plants are found in the blackbuck habitat including Besarma (*Ipomea species*) and Jalkumbhi (*Eichornia crassipes*). The major species of grasses include Love grass (*Eragrostis atrovirens*), Kode ghans (*Eleusine indica*), Dudhe Jhar (*Euphorbia hitra*), Kande (*Premna integrifolia*), Kansh (*Saccharum spontaneum*), Siru (*Imperata cylindrica*), Kush (*Desmostachya bipinnata*),Jobh (*Vetiveria zizanoides*) etc. Other grass species include Mothe Cyperus spp, Bhang (*Cannabis sativa*), Tapre (*Cassia tora*), Tipatiya (*Oxalis corniculata*), etc. listed in Annex I.

Degraded patches of Khair-Simal forest consist of scattered tree species of Khair (*Acacia catechu*, Sisoo (*Dalbergia sissoo*), Simal (*Bombax ceiba*) and Karma (*Adina Cordifolia*), Sindhure (*Mallotus philippinensis*), whereas the bushes include Asare (*Murraya koenigii*), Dhurusl (*Colebrookia oppositifolia*), Bhant (*Clerodendron infortunatum*), Sitabayar (*Zizyphus mauritiana*) and Tapre (*Cassia tora*).

2.5.2 Fauna

The major wild animals found in the area are blackbuck (*Antelope Cervicapra*), palm squirrel (*Funambulus Pennanti*) and Hare (*Lepus nigricollis*). Visiting animals include Rhesus monkey (*Macaca mullata*), Common langur (*Presbytis entellus*), Indian fox (*Vulps bengalensis*), Chital (*Axis axis*), Jungle cat (*Felis chaus*), Stripped hyena (*Hyena striata*), Wild boar (*Sus scrofa*), Jackal (*Canis aureus*) and Leopard (*Panthera pardus*). According to a report of KrCA there are fourteen species of mammal (Annex II), twelve species of reptile (Annex III) and sixty-four species of bird in the area (Annex IV).

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CHAPTER

3

Past Management and Present Practices

3.1 Conservation History

Nepal, as a contracting party to the Convention on Biological Diversity Convention, has obligations to formulate legal instruments for the conservation of biodiversity. Similarly, Nepal is also a party to Convention on International Trade in Endangered Species (CITES) of wild fauna and flora to ensure that international trade in specimens of wild animals and plants does not threaten their survival. So far, Nepal has developed various strong and progressive legal instruments. The Wildlife Protection Act, 2015 (1957) was the first to identify the importance of protecting wildlife in Nepal. Since then, almost all five-year periodic development plans have emphasized on the need for conserving wildlife. The National Parks and Wildlife Conservation Act, 1973 has provided a new concept of conservation with a broad legislation to establish NPs, Reserves and CAs for protecting sensitive areas and species. KrCA was declared to protect blackbuck in 2009 under this Act.

The blackbuck in Nepal was once considered extinct from its former habitats until reports of Dinerstein (1975) and Wegge and Welson (1976) revealed at least two separate populations in Banke and Bardiya districts. The main causes of loss of blackbuck have been attributed to encroachment, fragmentation, habitat loss, habitat degradation, hunting and poaching (Bista 1981, Shrestha 1997 and Majpuria et.al 1998). When the last remaining herd of blackbuck was sighted at Khairapur area (Bardiya) in 1975, a team of five staff members (1 staff and 4 armed guards) were assigned with the task of protecting the area. Prior to the establishment of KrCA in 2009, there was a continued joint effort on the part of the District Forest Office (DFO) of Bardiya and BNP (then Wildlife reserve) since 1975 for the conservation of blackbuck.

As directed by late King Birendra, a compensation of NRs. 100 per month was provided to affected local households to compensate crop damage caused by blackbucks (K. M. Shrestha Then Warden of BNP, pers.com). In 1988, DNPWC prepared a proposal for blackbuck conservation _ "Blackbuck Conservation Project," but it could not be implemented as planned. In order to establish alternative blackbuck population in other areas apart from Khairapur, the Central Zoo translocated a number of blackbucks to those sites in three different periods of time. The first translocation of 16 blackbucks to Baghaura Phanta of BNP was done in 1977-1979. Similarly, four more blackbucks were translocated to the same Phanta in between 1985-1988. However, following the two translocations, it was found that only 17 blackbucks remained there. But just after the monsoon of 1990, a monitoring team failed to find a single animal at the translocated site of the Phanta. In 1992, the Central Zoo once again translocated 26 blackbucks to Baghaura Phanta. Surprisingly, no single blackbuck was found in a monitoring following the monsoon of 1993. The translocated blackbucks could not survive in the new area, mainly due to predation and unsuitable habitat dominated by tall grass species (Pradhan et al. 2001). Then it was concluded that blackbuck cannot survive in the available habitat of Baghaura Phanta. The Government eventually decided on 25 January 1994 to acquire private land at Khairapur to conserve blackbuck population.

An assessment of new translocation sites was done by Khanal in 2002 (Khanal 2002). Suitability of habitat, chances of predation by carnivores and proximity to adjoining villages were considered while selecting the site. Comparative scenarios of three sites (Rauteli Bichuwa, Arjuni and Chaliaya Phanta of Suklaphanta Wildlife Reserve) were presented and Rauteli Bichuwa was recommended as the most suitable habitat for blackbuck. Translocation is still essential to safeguard the population of blackbuck in Nepal because Khairapur population is the only source population of the wildlife species in the country. The gene pool of this species must be improved by exchanging populations from elsewhere.

TABLE 1: DEVELOPMENT OF CONSERVATION HISTORY IN KrCA

Before 1950	Good number of blackbuck in Banke, Bardiya & Kanchanpur
Before 1970	Assumption of disappearance of blackbuck from Nepal
September 5, 1975	Sighting of blackbuck in Khairapur by then Warden Krishna Man Shrestha, researcher Dr. Eric Dinerstein & Game Scout Gagan Singh Churana
October 02, 1975	Department of Forests sent a radio message to BNP & DFO of Bardiya to set up a security post for the protection of blackbuck in Khairapur
1975	Provided Rs. 100 per month to 10 HHs as a compensation for crop depredation by blackbuck
1976	Encroachment started with the hope of receiving relief amount
1977	Prepared a proposal for blackbuck translocation from the Central Zoo
1977-1979	Translocation of 16 blackbucks from the Zoo to Baghaura Phanta of BNP
1983	Late king Birendra issued order to remove HHs from core blackbuck habitat to elsewhere
1985-1988	Translocation of four blackbucks from KrCA to Baghaura Phanta of BNP
1986	Government resettled 36 HHs from blackbuck habitat to elsewhere
1987	Nepalese students carried out blackbuck count for the first time
1988	DNPWC prepared Blackbuck Action Plan
1989	Only 17 blackbucks were counted at Baghaura Phanta
1989	Encroachment of blackbuck habitat started
1990	No blackbuck sighting at Baghaura Phanta
December 05, 1992	Translocation of 26 blackbucks from the Zoo to Baghaura Phanta of BNP
1993	No blackbucks were sightd in Baghaura Phanta after the monsoon
January 25,1994	Government decided to acquire private land to extend habitat and conserve blackbuck
1994-1996	Government initiated compensation to acquire private land for blackbuck conservation
2001	DNPWC submitted Blackbuck Conservation proposal to the Government
2002	Formation of local-level main committee for blackbuck conservation
2005	Rapid encroachment of blackbuck habitat started
March, 2007	DNPWC submitted Blackbuck Action Plan to the Government
March 16, 2009	Declaration of Krishnasaar Conservation Area
August 25, 2010	Establishment of Krishnasaar Conservation Area Office
August 26, 2010	Formation of Krishnasaar Conservation Area Management Council
2014	Floods inundate Khairapur resulting in the death of 40 blackbucks

3.2 Protection of KrCA

The KrCA head office is located at Khairapur and is under the command of Conservation Officer. There is one post at Turuntapur. The staff members conduct patrolling at least three times in a day, especially in the core areas. They also undertake monitoring in the settlement areas from where livestock enter into the core area. Similarly, the patrolling staff also chase away livestock if they are seen in the core areas. Sometimes, the owners of the livestock are fined if they repeat the offence. Stray dogs are also strictly controlled. Night patrolling is also randomly conducted as and when required.

In order to ensure community participation, four Conservation Area User Committees (CAUCs) have been formed. These CAUCs have formed Krishnasaar Conservation Area Management Council (KrCAMC), which is the apex body of CA communities. The users of local community forest have hired an individual to guard and do regular monitoring there.

3.3 Habitat Management

3.3.1 Forest Management

There are two patches of forests in KrCA, one is in the eastern side of core area near Turuntapur post and other one is in the northern side near Panditpur. The forest near Panditpur was handed over as community forest to the local community before the establishment of KrCA and is presently being managed as CF under KrCA.

3.3.2 Grassland management

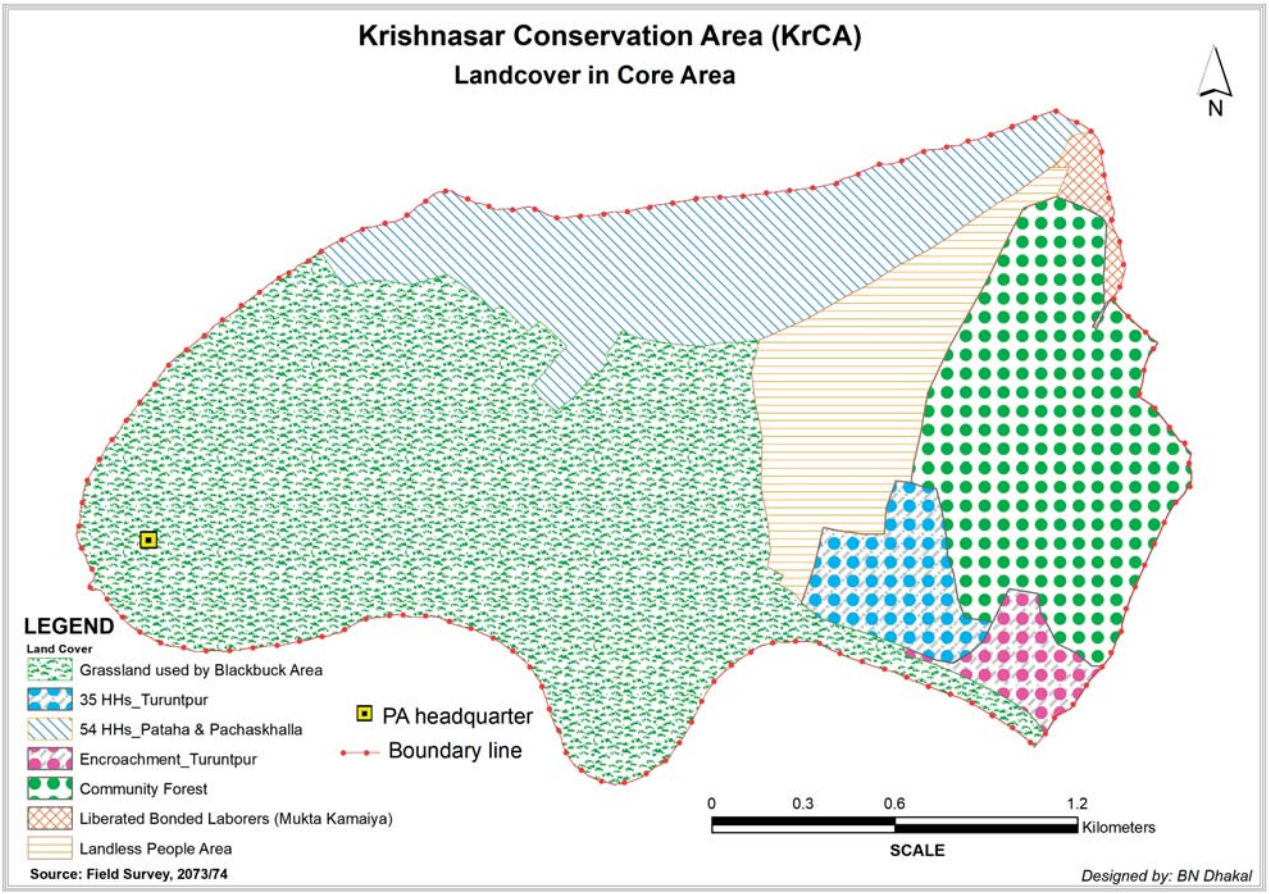
Grassland ecosystem is dynamic and productive ecosystem

and it always has a key role in providing suitable habitat for ungulates. At present out of 16.95 km^2 only 5.27 km^2 is core area (Figure 7). There are various grass species in KrCA and the preferred species by blackbuck are Dubo (*Cynodon dactylon*), Mothe (*Cyperus rotundus*), Banso (*Bothriochloa ischaemum*), Dubai Banso (*Bothriochloa ischaemum*), Jwano Ghans (*Fimbrisrysis dichotoma*), Siru (*Imperata cylindrica),* Dhursul (*Colebrookia oppositifolia*) etc. These palatable grass species, however, are declining due to grazing by local livestock and intrusion of invasive species. Management of grassland is mainly done by manual uprooting and burning of weeds and invasive species, while mechanical ploughing is done by using tractors. The use of tractor enables to control invasive species and promote palatable species such as Dubo (*Cynodon dactylon*). In dry season, few area of grassland is irrigated through boring (for ground water) to promote sprouting of palatable species. Grass cutting is allowed during the rainy season to control tall grasses because blackbucks do not prefer them. In addition, controlled grazing is also allowed to suppress tall grasses as as local livestocks feed on them. This leaves short grasses for blackbucks. Grass cutting and grazing is an important part of grassland management which is done in certain blocks on a rotational basis. KrCA management regulation will be developed to regulate grazing and grass cutting.

Invasive species such as Jarakush (Cymbopogan spp.), Tapre (*Cassia tora*), Kantakari (Solanum sps.) and Parthenium (*Parthenium hysterophorus*) are rapidly spreading across the grassland of KrCA. In the aftermath of the floods of 2071, invasive species such as the Gande Jhar (*Ageretum conyzoides*) has also invaded the area. These invasive species must be inventoried and controlled to safeguard the source population of boackbuck. Such invasive species could be used to produce bio-briquette. Similarly, the organization presently working to produce such products from such invasive species could be contacted to convert weeds into wealth.

Raised mud mounds are envisaged as an important activity to save blackbuck from flood waters. In the event of flooding, they can take refuge on such raised mounds. Such raised mounds need to be improved every year.

FIGURE 6: LAND COVER MAP IN CORE AREA OF KrCA



3.3.3 Wetland Management

Wetlands are biodiversity hotspots and they provide habitat for a wide range of animals and plants. Many species of birds and mammals rely on wetlands for food, water and shelter, especially during the migration and breeding seasons. National Wetland Policy 2069 (2012) gives high priority to restore wetlands to support diverse wildlife species that depend on them. There are two elongated wetlands on both sides of KrCA entrance. The eastern wetland covers an area of 12.8 ha., whereas the western elongated wasteland is spread on 16 ha.of land (Figure 8). This wetland is hardly used by blackbuck as most of the area is invaded by unpalatable *ipomea* species. But this wetland is very useful for birds because after the uprooting of *ipomea* many bird species have been sighted here. Similarly, local people also use this wetland for fishing.

As part of a wetland management intervention, local people can uproot or cut *ipomea* during spring so as to use it as fuelwood. Along the western stretch of the wetland four fish ponds have been constructed and allowed separate User Groups (UGs) to manage it with the objective of improving the livelihoods of poor households of the locality. The other objective of these fish ponds is to control *ipomea* species. Likewise, twelve waterholes have been constructed to provide water for blackbuck. Boring is used to supply ground water to most of these water holes.

3.4 Anti-poaching and Intelligence Gathering

Intelligence gathering is the first step to effective anti-poaching. Actions are taken based on the information collected from local communities regarding illegal timber collection, grass collection and livestock grazing but as of now there are no established mechanisms to gather and analyze such type of information. However, due to the influx of outsiders in the area, there is a need to set up and mobilize informants' network to collect reliable information on wildlife crimes in the locality.

3.5 Tourism and Interpretation

There is insignificant tourism activity in KrCA and the interpretation service for visitors is also not significant. For this reason, KrCA and the private sector will have to work closely to promote tourism activity here. The Visitor Information Centre (VIC) at the head office provides information on blackbuck. Similarly, simple brochures are also available here. At present, a number of Machans (Watch Towers) have been constructed to watch blackbuck and birds. The VIC needs to be well equipped with latest information material and interpretation services. A building will have to be built for VIC along with ticket counter, entrance gate, rest rooms and waiting place for visitors.

3.6 Research and Monitoring

Only a few research works have been conducted by national and international scientists. Most of the research works have been done by the students of Tribhuvan University for their B.Sc. and M.Sc. thesis. The students need to take permission from DNPWC to conduct field work in the PAs and they have to submit a copy of their thesis after completion of their research work. The area of such studies is primarily focused on survey and other aspects of blackbuck, invasive alien species, ecology, habitats, biodiversity and floral and faunal species found in the CA. Similarly, monitoring of blackbuck on regular basis is very important for the management of KrCA. The result of periodic monitoring gives an idea on the trend of blackbuck population. For this reason, KrCA staffs regularly conduct monitoring to ensure the safety and conservation of the blackbuck here.

3.7 Human-Wildlife Conflict

3.7.1 Collection of Timber and Fuelwood

On the northern side of the CA there is a community forest called Bageshwori Conservation Community Forest (CF). It lies in the proximity of Panditpur. Local users of the CF collect fuelwood and cut grass there for fodder and thatching as per the operational plan, which reduces pressure in the CA. In addition to this CF, there is a patch of forest, which was previously managed, protected and utilized by residents of Bechaipur and Tulsipur. KrCA allows collection of fuelwood and cut thatch grass once in a year to reduce fire hazard in the forest. But there are occasional incidents of illegal felling of trees.

3.7.2 Livestock Grazing Inside Blackbuck Habitat

Livestock farming is a traditional mode of livelihood for many residents in the KrCA. Blackbucks have been grazing alongside local livestock since time immemorial. This also helps in grassland management intervention because cattle feed on tall grass, leaving shorter grass for blackbuck. For this reason, grazing is also allowed in some of the blocks of KrCA during monsoon. Despite this, livestock grazing inside the blackbuck habitat is a problem because it is estimated that around 1000 livestock graze inside KrCA every day. The increase in livestock number has created competition not only between and among cattle but also between them and the blackbucks. As a result of which the staple palatable grass preferred by blackbuck has reduced, Moreover, this has increased the invasive species of weeds. In addition to this, there is a high possibility of transmission of disease from livestock to blackbuck such as the foot and mouth disease. Controlling livestock grazing inside core habitat has become a challenging task as there is no alternative grazing area for livestock. KrCA efforts to control or regulate grazing have resulted in conflict between the management and

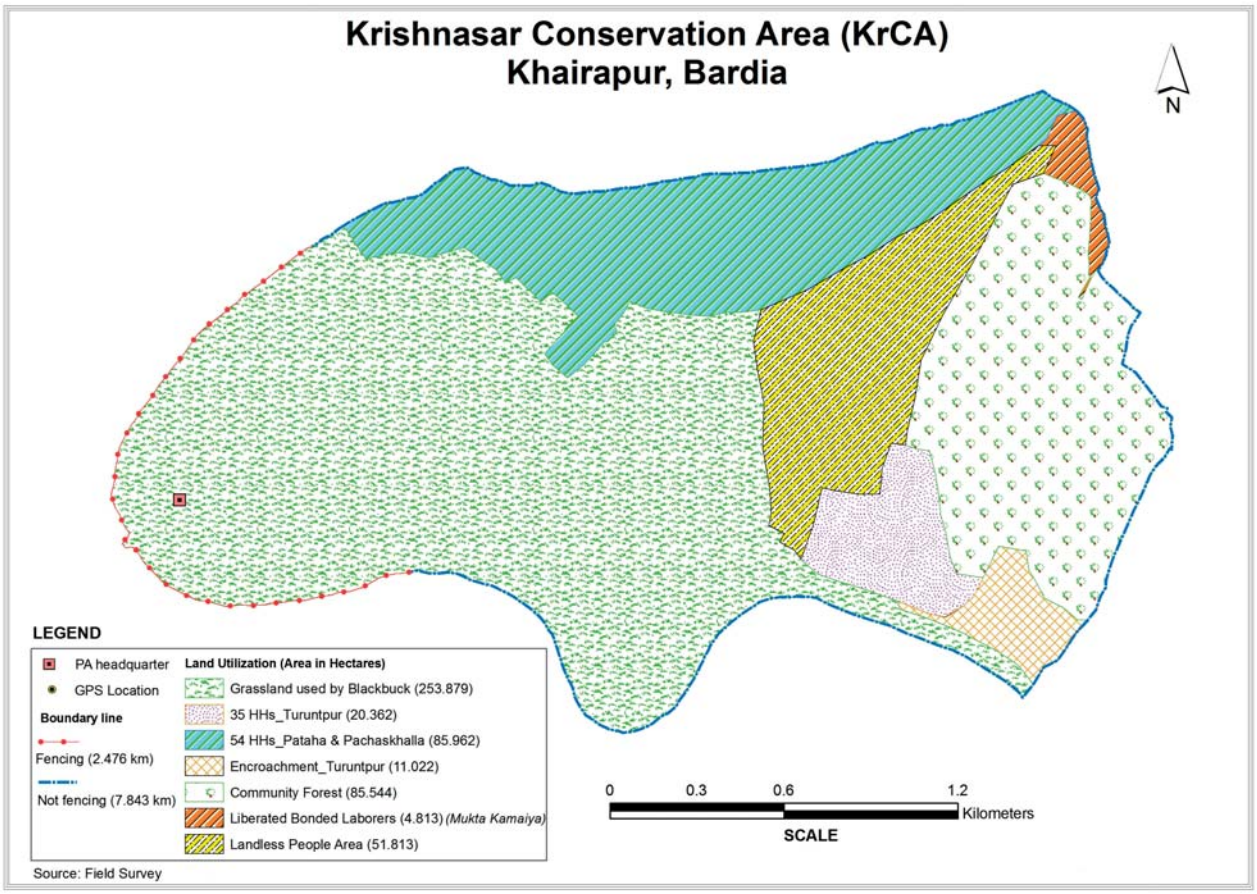
local communities. Increasing number of livestock and the resultant grazing pressure pose a problem of conflict and a challenge for KrCA.

3.7.3 Encroachment and Resettlement Issues

Most of the current blackbuck habitat used to be private land and people have been living there since 1971. When the last remaining population was sighted in Khairapur, the GoN took an initiative to protect the wildlife species. In 1994, a total of 488 hectares of land consisting of 173 ha. of registered land, 105 ha. of *ailani* (unregistered land) and 210 ha. of forest was proposed as KrCA. Record shows 73 HHs encroaching 105 ha. of *ailani* land as illegal settlers. In 1994,1995 and 1996, the Government, respectively, allocated Rs. 40 lakhs, and 1 crore as compensation for the requisition of land. Only 167 ha. of land could be registered in the name of BNP as 6 ha. of land was found to be *ailani* land. Following the compensation program, the number of illegal settlers in *ailani* land was decreased to 54 HHs in 1997.

In 2005, 177 HHs of squatters (or so-called landless people) and 94 HHs of freed bond-laborers occupied the core area. The area was declared as KrCA only in 2009. The Commission for Free Bonded- Laborers resettled 12 HHs of free bonded-laborers in 2 ha. of northern part of KrCA near Bechaipur. Similarly, Landless Problem Resolution Commission resettled several HHs of land less people in different parts of Bardiya district (Figure 7), and now only 49 HHs are living inside KrCA. Likewise, the 49 HHs living in *ailani* land in 1997 has increased to 93 HHs in 2014 due to fragmentation of landed property between brothers. Thus, altogether 142 HHs (49 HHs of landless people and 93 HHs living in the *ailani* land) are still encroaching around 60 hectares of land inside the core blackbuck habitat.

FIGURE 7: ENCROACHED AREAS IN KrCA



Similarly, it was found that some 13 ha. of core area has been registered as private land even after the acquisition of land (Figure 8). The issues relating to resettlement of landless households could not be settled/resolved initially because of the volatile political situation in the country and it has become a complex problem over the years. The existing settlement in *ailani* land happens to be a very important biological corridor, which connects KrCA with BNP through the Babai. Thus, this issue has been taken to the Ministry of Forests and Soil Conservation to address it at the Government level. The encroachment by illegal settlers in *ailani* land and the other encroachers there have posed threat to the blackbuck population as they not only live there but also grow crops, rear livestock and frequently walk through the core area (even at night) and disturb the blackbuck.

3.8 Administration and Organization

3.8.1 KrCA Management Unit

The conservation officer (GO-3) heads the KrCA management unit under the command of Director General of DNPWC. KrCA management has 24 approved positions in the technical, administrative, and finance sections. The conservation officer is supported by two rangers, one finance assistant, one office assistant, one computer operator, one driver and 12 game scouts. The positions of four senior game scouts and eight game scouts are still vacant and to fill the vacant posts of junior-level frontline staff, eight game scouts, driver and office helper have been hired on contract. However, the position of veterinary staff has not been considered in the approved positions for KrCA.

3.8.2 Conservation Area Management Council

KrCA has been implementing community development programs in accordance with the National Park and Wildlife Conservation Act, 1973, Fourth Amendment 1992, and the Conservation Area (Government Management) Regulation 2000. Altogether there are 86 UGs consisting of 43 male UGs, 43 female UGs and 4 UCs under the Conservation Area Management Council.

The 86 UGs have formed four User Committees (UCs) with nine executive members in each committee. The chairperson of these UCs and representatives from District Coordination Committee (DCC) constitute the KrCAMC, which is the apex community institution of KrCA. The conservation officer serves as the member secretary.

3.9 Strengths, Weaknesses, Opportunities, and Threats

3.9.1 Strengths

- The source population of endangered blackbuck draws attention of GoN along with that of global community for its conservation
- There is a possibility of revenue generation from tourism which could be recycled for conservation and development through KrCAMC
- Encouraging partnership with local communities and stakeholders, including national and global conservation organizations

3.9.2 Weaknesses

- Lack of political commitment for the resettlement of encroachers from blackbuck habitat since a long time
- Insufficient resources to control invasive alien species which is invading palatable species rapidly
- The settlement inside KrCA has caused difficulty in controlling excessive grazing inside the core blackbuck habitat
- Lack of tourism infrastructures for national and international visitors, especially regarding food and accommodation
- The traditional right of local people to use road does not permit to close it even at night
- Inadequate physical infrastructure has made all staff members to stay in the head office and move from there for day to day monitoring work

3.9.3 Opportunities

- Engagement and investment of local level in conservation
- Potential for GoN to generate revenue by developing tourism infrastructure for national and international visitors
- Increase in the income of local people through tourism-based business, enterprises and jobs
- Chances of maintaining good relations between local people and CA authority through people's participation in blackbuck conservation
- Chances of conducting various research/studies in collaboration with conservation partners, and implement the findings in KrCA and other similar areas

3.9.4 Threats

- Continued delay in addressing the encroachment issues will pose threat to the conservation of blackbuck as the core blackbuck habitats is shrinking over time
- Invasion of unwanted species will affect the growth of palatable grass for blackbuck
- Possibility of floods in the rainy season
- Lack of proper fencing of the core area to protect the wildlife from dogs and poachers

PART B
THE PROPOSED MANAGEMENT

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CHAPTER

4 Vision, Goal and Objectives

4.1 Vision Statement

Blackbuck and its habitat are restored and maintained in KrCA in perpetuity.

4.2 Management Goal

Enhance blackbuck conservation to benefit local to global communities.

4.3 Management Objectives

The main objective of KrCA management plan is to enhance the blackbuck population together with associated flora and fauna, and promote ecotourism and support livelihoods of local community. The specific objectives are:

- To safeguard blackbuck population by resolving resettlement issues, especially by relocating illegal settlers and encroachers elsewhere and improving existing habitat to conserve the source population of blackbuck
- To conserve blackbuck together with other associated flora and fauna under changing climatic condition
- To promote tourism in KrCA through the development of tourism infrastructure and diversifying tourism products as well as by providing tourism facilities and organizing events to attract tourists which will eventually benefit local communities
- To enhance participatory blackbuck conservation initiatives through conservation communities by supporting them in conservation, community development, skill development and conservation awareness raising activiies
- To build and strengthen capacity of KrCA and conservation communities to enable them to deliver services effectively and efficiently

4.4 Major Challenges in Achieving Objectives

4.4.1 Component I: Habitat Management

One of the major challenges of safeguarding blackbuck population is to resolve the resettlement issues, especially by relocating illegal settlers and encroachers elsewhere, and improving existing habitat to conserve the source population of blackbuck

Challenges

- Evicting illegal settlers from *ailani* land and other encroachers has not been possible as there is no provision of providing compensation to them
- Even after the requisition of all 167 ha. of land by paying compensation and registering them under BNP, 13 ha. of core habitat area was registered as private land
- The use of western fire-line as an access road by the local people of Panditpur as well as illegal settlers and encroachers could not be stopped as there is no alternative route for them and as a result the movement of local people through the core area even at night has not stopped, which disturbs blackbucks
- Keeping blackbuck inside the core habitat is difficult and they often raid crops in adjoining crop field because there is insufficient palatable grass species in the area. Moreover, the grassland is degraded because of weeds and invasive species
- Wetlands in KrCA has been invaded by *Ipomea*. Local people cut it every year but it is yet to be controlled

4.4.2 Component II: Species Conservation

To conserve blackbuck together with other associated flora and fauna.

Challenges

- Although livestock grazing has been envisaged as an important grassland management intervention but allowing huge number of cattle to graze alongside blackbuck in its core habitat degrades the grassland. Thus, controlling the number of grazing cattle has been a great challenge
- Despite ongoing efforts to vaccinate local livestock, cases of new cattle and those domestic animals that missed vaccination always pose a problem of

transferring foot and mouth disease to blackbuck
- The invasion of *Ipomea* in the wetlands in KrCA has degraded the ecosystem there. Mechanical removal of the species at present seems a major challenge. This has affected birds and associated aquatic species
- The effect of climate change could already be visualized. The flash floods in 2071 inundating KrCA, killing 40 blackbucks. It has also resulted in the invasion of weeds. Assessment of phenology of plants and wildlife together with the reproductive behaviors of blackbuck owing to climate variability is yet to be studied

4.4.3 Component III: Tourism Development

To promote tourism in KrCA through the development of tourism infrastructure and diversification of tourism products. The activities also include providing facilities and organizing events to attract tourists to benefit the local community.

Challenges

- There are limited opportunities for package tourism for visitors at present
- Dissemination of information from local and national news media in the negative way not only affects tourism but also makes it difficult for the management to work
- The cultural and religious heritage sites of KrCA has not been able to attract visitors owing to poor maintenance and management of such sites
- Infrastructures such as wildlife watch towers and jungle trails for better blackbuck viewing for visitors are inadequate
- Local people do not wish to take risk by investing in tourism business, especially in providing food and accommodation

4.4.4 Component IV: Community Development

To enhance participatory blackbuck conservation initiatives through conservation communities by supporting them in conservation, community development, skill development and conservation awareness raising.

Challenges

- There is only one community forest in KrCA and the catering of forest resources to the people of western and southern part of CA is a huge challenge for KrCA. In addition to this, the available private/public land is insignificant to develop forest
- Improper extraction of sand, gravel and stone from the Babai riverbed causes the river to change its course. Moreover, there is inadequate response to river training due to unavailability of budget. Furthermore, recent climate trends and events have projected a rise in flooding events in the area
- The demand and supply of fuelwood will only be matched if renewable energy technology is introduced. However, the intervention of renewable technology such as biogas, bio-briquette and improved cooking stove is expensive, and, providing alternative energy to only a limited number of HHs will be a challenge to KrCA authority
- Inadequate understanding and communication at the local level has resulted in the impression at that level that infrastructure development (roads, drainage, drinking water, irrigation, community buildings) in KrCA is entirely the responsibility of KrCA authority
- Animal deterrent or the extension of alternative farming program (such as, mentha and sunflower cultivation, etc) has not been effective
- Micro-enterprise development, community capital mobilization skill development, employment generation and special incentive-oriented program (for STGs, landless, poor, and women) is poor
- Community based cooperatives are yet to be institutionalized and strengthened
- Due to inadequate resources the objective of establishing and strengthening conservation and livelihood improvement linkages with local people has failed to convince them for their active participation in the endeavor

4.4.5 Component V: Strengthening Institutional Capacity

To build and strengthen capacity of KrCA and conservation communities to deliver services effectively and efficiently.

Challenges

- The research studies conducted thus far in the area are inadequate mainly due to limited resources
- Inadequate human and numerous key positions vacant
- Inadequate physical resources including infrastructres (posts and staff quarters)
- Inadequate resources to operate office (laptops, printers, power backups)
- Limited priority to enhance KrCA staff and local community capacity on emerging issues of biodiversity conservation and climate change, including technical innovations, and gender and social inclusion issues

CHAPTER

5

Management Strategies

5.1 Boundaries

5.1.1 Legal Boundary

The boundaries of KrCA are well defined and delineated by natural landmarks such as rivers and roads. This is mentioned in section 2.1.1.

5.1.2 Administrative Boundary

The northern boundary blackbuck habitat area under of the KrCA is connected to Panditpur of ward number 2 and Bechepur of ward number 4 Gulariya Municipality whereas the southern boundary adjoins Nimkothiya ward number 3 and Khairanjhala tole of ward number 2. Likewise, the eastern boundary adjoins Tulsipur and Bechepur tole of ward number 4. The western boundary of KrCA habitat area is demarcated with pillars, separating settlement area of Jainpur tole of ward number 2.

5.1.3 Ecological Boundary

This is mentioned in section 2.1.2.

5.2 Zonation

Zonation is a powerful Protected Area (PA) management tool that enables the spatial management of PA, and, it has to achieve the protection of the area's key ecological features and sensitive habitats, together with the sustainable utilization of the area for tourism and other uses. Zoning provides a framework for planning by designating zones with different management objectives and allowable human impacts. It allows the planners to focus on proposed conservation and development activities and resources on different zones. This ensures a balance/trade-off between conservation and development objectives. The use of this methodology will enhance conservation planning by ensuring effective conservation and development.

Although, KrCA has not adopted zoning so far, the principal factors involved in the implementation of the zonation plan are the need for the protection of (especially) critical habitats and biodiversity therein, along with the need to manage and mitigate human impacts– both from within the CA itself, for example from visitor use, as well as from neighboring habitation areas. Four main zone types are prescribed to achieve different management objectives in different parts of the CA.

5.2.1 Management Facility Zone

This is the zone inside CA occupied by infrastructures such as office buildings for staff accommodation and posts.

5.2.2 Utility Zone

This is an area of the CA allocated for limited recreational activities for the visitors along with nature interpretation services on conservation awareness. The western fire-line which links Panditpur is also used by local people for movement. There are also a few tourism infrastructures developed inside KrCA, including visitor information center, watch towers for wildlife viewing and fire-lines. The main objective of managing this zone is to provide access to local people and regulate tourism in the designated area. It is also aimed to enhance visitors' satisfaction by providing wilderness experience.

5.2.3 Core Zone

In addition to the facility zone and utility zone, some specific area of KrCA has been set aside as the core zone which is mentioned in the plan as the core area. The main objective of this zone is to provide suitable habitat for blackbuck and to encourage research and science-based management intervention.

5.2.4 Community Development Zone

This is the area which falls outside the core area and includes all the settlements and private lands, where environment-friendly development activities will be carried out to reduce local people's dependency on forest resources, while also improving their livelihoods. In this zone, infrastructure development activities could also be done with the budget set aside by local bodies.

5.3 Theme Plans

5.3.1 KrCA Protection

5.3.1.1 Context and Issues

The head office of the conservation area is at Khairapur and is under the command of Conservation Officer. There is also a post in Turuntapur. In order to reduce crop damage (by blackbuck) related conflicts with local farmers, four Conservation Area User Committees (CAUCs) have been formed and mobilized. These four CAUCs have jointly formed the Krishnasaar Conservation Area Management Council (KrCMAC), which is the apex body of CA bodies. The KrCA staff regularly monitors blackbuck population and their habitat while KrCMAC facilitates community participation in conservation and awareness activities.

The dirt road that is in the middle of core area has been closed and an alternative road has been constructed along the western boundary of the CA to provide access road tor the local people of Panditpur. There is a need for an additional post in the Panditpur area to monitor suspicious movements of locals in the locality. Similarly, conservation awareness of the local community members should be increased for effective blackbuck conservation.

5.3.1.2 Strategies

- Resolve the existing problem relating to encroachment from the Government level by giving high priority to blackbuck conservation
- Allow house owners to take away building materials such as timber, bricks, window and door frames etc. after the dismantling of their houses
- Clear the debris of dismantled houses to increase core habitat for blackbuck
- Set up a post near Panditpur to control illegal activities
- Continue regular monitoring of the area including the adjoined forests by using forest trails, bicycle, motor bike and other vehicles
- Intensify random monitoring at nights to monitor predators and poachers
- Installation and use of CCTV at strategic locations to monitor movements of intruders, suspicious local people and predators
- Set up a local informants' network and gather information on intruders and poaching activities
- Set up a regular reporting and information sharing system

5.3.1.3 Activities

- Construction of office building of Head Quarters (HQ)
- Construction of post at Panditpur
- Construct staff quarters at Khairapur
- Construction of KrCA entrance gate
- Repair and maintenance of office buildings of the HQ, guard posts and staff quarters
- Supply of electricity at office and guard post buildings
- Construction, maintenance and upgrading of fire-line
- Installation and maintenance of CC cameras where forest and grasslands adjoine and at strategic locations to monitor predators
- Demarcatation of core area and maintenance of the core area fencing
- Promotion of bio fencing by planting bamboo, babul, asuro
- Provide necessary logistic support to staff members for patrolling
- Procurement of 5 night vision binoculars for monitoring at night
- Procurement of 30 bicycles and three motor bikes for guard posts
- Procurement of one four-wheel-drive vehicle for day-to-day operation and management
- Maintenance and repair of vehicles
- Fuel for vehicles

5.3.2 Habitat Management

5.3.2.1 Context and Issues

Habitat management in KrCA is largely affected by illegal settlers and encroachers; excessive grazing by local livestock; invasive species; wetland degradation and impacts of recurring floods and prolonged droughts. In addition, intrusion of invasive species such as *Cassia tora* and Jarakush has degraded grassland and suppressed palatable grass species. It has been observed that the number of invasive species has increased following the floods of 2071. Manual uprooting and burning (to some extent) has been carried out to control these invasive species, which is cumbersome and expensive. More studies need to be conducted to find ways to control these invasive species. At present, a hired tractor is being used to plugh the land and bring back the palatable Dubo grass (*Cynodon dactylon*). This is also aimed at suppressing the invasive species. However, owing to budget constraints, only 25% of the core area could be managed using the tractor. Similarly, in summer months, grass dries up due to shortage of water. In order to tackle the problem, boring is done to extract ground water to irrigate the grassland and facilitate the sprouting of palatable grass for blackbuck.

5.3.2.2 Strategies

- Habitat reclamation after relocating encroachers and removing the debris
- Develop effective measures to irrigate grassland in dry season
- Control livestock grazing inside the core area by developing alternate grazing land outside it
- Regulate livestock grazing and grass cutting for certain period of time in the rainy season to facilitate the growth of palatable short grass for blackbuck
- Collaborate with District Livestock Service Office (DLSO) to encourage local inhabitants to use stall-

feeding and replacing unproductive livestock, while also encouraging them to use vaccination against foot and mouth disease
- Collaborate with researchers and academicians to carry out studies to control Invasive Alien Species
- Involve local communities, including those who are dependent on wetlands for their livelihood along with their institutions in the management of wetlands
- Strengthen communication, collaboration and coordination with local Government to pool resources
- Adopt communication tools for public awareness and education program for local community members and stakeholders

5.3.2.3 Activities
- Procurement of tractor and other equipment for grassland management
- Grassland management by hiring tractor (before tractor is procured)
- Establish permanent plots to assess the condition of palatable grass for blackbuck
- Cultivate *kimbu* or suitable crop as an alternate food for blackbuck
- Control invasive species by uprooting them
- Removal of *ipomea* in the wetlands or from old drain made by the Babai river
- Plantation of Birds' favorite *bar, pipal* and *swami* on the periphery of Babai drainage
- Construction of water holes
- Maintenance of wetlands and water holes,
- Installation of solar water pump to irrigate grasslands in dry months
- Underground pipe fitting for irrigation
- Maintenance and repair of pump used for boring,
- Maintenance and construction of existing and additional raised mud mounds
- Support for the operation of Nursery in the locality,
- Create grazing land in public land outside the core area to reduce grazing pressure in it
- Create and restore wetlands outside the core area to provide water for livestock
- Undertake river training activities around the Babai River with the support of Local Government to control recurring floods which inundates KrCA

5.3.3 Fire Management
5.3.3.1 Context and Issues
Human induced fire in the dry months creates difficulties even for blackbucks of the core area to find a safe refuge. KrCA and local conservation committees continue to work together to control such fire which occurs mostly in the hot and dry summer seasons. Considering potential impacts of climate change in the form of extended dry spells, possibilities of increase in the number of fires is high. The main objective of fire management in KrCA is to avoid adverse effects of fire to blackbuck and its habitat.

5.3.3.2 Strategies
- Develop a network of fire-lines
- Develop fire controlling capacity of CA staff, members of Community Forest User Groups (CFUG) and the CA communities
- Increase awareness of CA communities on prevention of fire incidents
- Purchase fire-fighting toolkits equipment

5.3.3.3 Activities
- Preparation and implementation of fire-fighting management plan
- Identification of fire prone areas by using mapping based on satellite imagery analysis or by using the web-based fire mapper
- Conduct training on fire-fighting techniques for KrCA staff and local people
- Carry out controlled burning activities in fire prone areas before the onset of fire season
- Provide fire-fighting equipment to guard post(s) and CFUGs
- Mobilization of fire-fighting team (consisting of CA staff and locals) with necessary equipment in order to stop spreading of fire in grasslands
- Construction of four dual-purpose ponds to provide water for blackbuck and other wildlife including birds which could also be used to extinguish fire
- Construction of fire hydrant which is to be supported by solar pumps installed in nearby ponds,
- Awareness raising on fire prevention and forest fire control
- Setting up of fire occurrence reporting and statistical databases system

5.3.4 Wildlife Health Management
5.3.4.1 Context and Issues
Regular interactions between blackbucks and local livestock is obvious either directly or through the sharing of the same grassland or waterholes as there are villages in and around the CA. Blackbucks sometimes come in contact of local livestock when they stray out of the core area. Since that there is always a risk of transferring of disease from livestock to blackbuck and vice versa, health monitoring and surveillance of diseases is a key priority. Besides, regular and timely immunization of local livestock (raised around the CA) against major communicable diseases is important to prevent the outbreak of disease. Thus, preventive measures need to be prioritized because medical treatment of free ranging animals will require a huge investment and is not possible in many cases due to their frequent mobility.

5.3.4.2 Strategies

- Formulation of protocol for wildlife health monitoring and disease surveillance
- Coordination with District Veterinary Offices, and seek their support as and when required

5.3.4.3 Activities

Since medical treatment of free ranging animal requires lots of investments and is not possible in many cases, it would be wise to put emphasis on preventive measures. The activities to be carried out for wildlife health management are to:

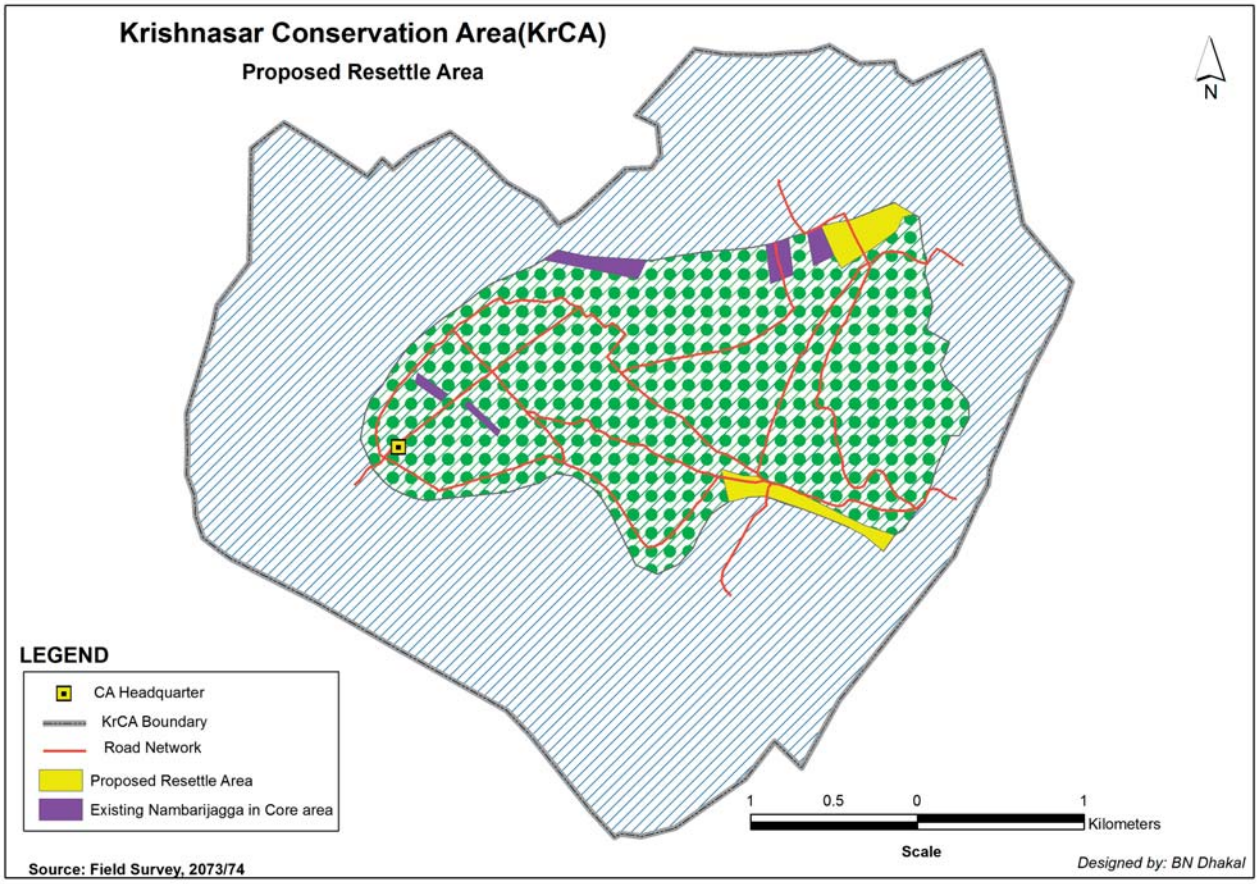
- Set up wildlife rescue center at the HQs for emergency treatment
- Treat injured blackbuck at the rescue center with the help of BNP/DLSO
- Vaccinate local livestock every year in coordination with conservation partners and DLSO against possible diseases that could be transferred to wildlife
- Support to set up a community-based veterinary center with necessary medicines and equipment for medical emergencies
- Provide training to frontline staff to monitor, record and report on disease or the blackbucks that are in poor health conditions
- Conduct postmortem of dead wild animals with the support of BNP or district veterinary office
- Assess cases of blackbuck mortality to document the emergence and spread of disease
- Monitor water quality of wetlands and water holes at regular intervals

5.3.5 Encroachment/Settlement Management

5.3.5.1 Context and Issues

There are still illegal settlers and encroachers living inside the core blackbuck habitat, diminishing the growth of grassland and disturbing wildlife for extended periods of time. The delay in the resettlement process might induce more encroachment in the future. This issue was forwarded to Ministry of Forests and Soil Conservation (MoFSC) in 2016/2017, and small team has been formed comprising joint secretaries of DNPWC and MoFSC. The team undertook a field visit and assessed the situation on the ground, and has submitted a report to the MoFSC with recommendations for possible solutions (Figure 8).

FIGURE 8: PROPOSED RESSETTLEMENT AREAS IN KrCA



5.3.5.2 Strategies

- Discouraging encroachment of core area of CA and CFUG with immediate response for eviction
- Well coordinated and effective collaboration with DAO, CA communities, political parties, local NGOs and conservation partners to evict encroachers in accordance with current government policy
- Use of related information through effective communication strategy to enhance awareness of local people about the consequences of encroachment

5.3.5.3 Activities

- Keeping updated data on registered land, illegal settlers and the encroachers in the *ailani* land,
- Formation of committees to address the issues with regard to registered land, illegal settlers in unregistered land and other encroachers
- Calling all-party meetings to resolve the resettlement issues
- Work with the committee formed by MoFSC and prescribe possible solution
- Issuance of notice to evict squatters from the encroached land
- Providing compensation for registered lands
- Providing support to improve the livelihoods of landless people and flood victims who have encroached the conservation area for various reasons, and evict them in a win-win way

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CHAPTER

6

Research, Monitoring and Capacity Building

6.1 Research Priorities

Research is essential for every PA as it helps to develop database, which is helpful in decision making process. To ensure effective management, there should be sufficient information on bio-physical, ecological and socio-cultural aspects of PAs. In addition, it allows scientific management of PA and serves as a tool to solve problems. Thus, research should be oriented towards fulfilling management gaps and needs. However, very few serious research studies have been conducted here. Most of the research works have been done by the students of Tribhuvan University for their M.Sc. thesis, primarily focusing on survey and other aspects of blackbuck, invasive alien species etc. To ensure that research results are applied to conservation and management of KrCA, there is a need for coordination for the works of different national and international researchers. The formation of a separate research unit is necessary to take the lead and coordinate research activities conducted thus far and to synthesize the research results to be used in the management of KrCA.

Top research priorities of KrCA include grassland management under changing climatic conditions, spread and control of invasive species, and predator-prey interactions. In addition, more studies should be conducted with regard to habitat suitability in the land from where illegal settlers have been evicted, the carrying capacity of existing available habitat and grasslands, and identification of the main causes of increasing death rate of blackbuck. Research areas have mostly been determined by the interest of the individual researchers. Thus, the research needs of KrCA should be be aligned in collaboration with various academic institutions and conservation partners through DNPWC.

For this reason, there is a need to set research priorities for KrCA. The priority areas for research are as follows:

- Preparation of a zonation map of KrCA with proper delineation of facility zone, utility zone, core zone and community development zone
- Assessment of permanent plots
- Study on population dynamics, animal health and diseases
- Study about carrying capacity of blackbuck in KrCA
- Study on predators of blackbuck in KrCA and its impact on blackbuck conservation
- Assess the need of livestock grazing regarding grassland management in favor of short grass,
- Study of possible diseases that could be transmitted from domestic animal to blackbuck
- Preparation of a list of invasive species and prescribe ways to control them
- Research study to treat and control invasive species
- Study on the use of invasive species to produce tourism products so as to convert weeds into wealth
- Research study to find out whether genetic loss has been happening in blackbuck
- Research study about the impacts of climate change on blackbuck habitat with a specific focus on grasslands and invasive species after floods and droughts
- Research study about the effect on the health of blackbuck's after they consume ground water containing arsenic
- Study on human-wildlife conflict caused by problem animal
- Assessment of the condition of translocated blackbucks and survey of potential areas for further translocation
- Study on water quality and its impact on animals
- Study on the impacts of tourism in KrCA
- Study on the relationship between the intensity of anthropogenic activities and health of viable blackbuck populations
- Study on the management effectiveness of KrCA
- Evaluation of the five-year management plan 2074/75-2078/79
- Preparation of a five-year management plan 2079/80-2083/84
- The need to conduct the IEE of the management plan 2079/80-2083/84

6.2 Monitoring

Regular monitoring of blackbuck is very important. This monitoring produces time series data and helps the management to assess trends in population size, habitat condition, and male-female ratio and in population, distribution of the animal. It also enables the management to analyze information or data, and informs about the change in trend of blackbuck population over time. With the data from continuous monitoring, an appropriate management decision can be made.

6.2.1 Population Monitoring

Blackbuck Monitoring

- Conduct direct counting and maintain record on daily basis
- Monitor the predators that prey on blackbuck in KrCA

Bird Survey

- Survey of migratory and resident birds
- Monitoring of globally threatened and nationally protected birds

6.2.2 Habitat Monitoring

Forests, grasslands and wetlands are important components of habitat management. The grasslands of KrCA have deteriorated because of invasion of alien and unpalatable species. Increasing drought and recurring floods may have negative impacts on the grassland habitats of KrCA. Over grazing by local people's livestock has exerteed pressure on food availability. Thus, monitoring of habitat and study on food plants, physical and phenological changes in vegetation along with the monitoring of key indicator grass species that could be used in assessing habitat condition is important. Regular monitoring of *Jarakush* , *Casia torais Solanum, Parthenium,* etc. essential to inform management interventions.

6.2.3 Fire Monitoring

Although forest fires are not a major problem in KrCA, there are frequent incidents of fire in two patches of the forest, especially during the spring season. There are forest watchers, who carry out monitoring work to prevent forest fire. Similarly, regular awareness programs on the hazards of forest fire is also conducted.

6.2.4 Tourism Impact Monitoring

Although tourism development at KrCA is at an early stage, it is likely to grow in future. It must be considered that visitors in core areas of KrCA could have multiple impacts on its natural environment. Thus, ecological impact of tourism should be monitored regularly. Since there is no comprehensive framework at present to monitor such impacts, site-specific framework will have to be developed to monitor the changes here, regarding socio-economic impacts of tourism, a format will be developed by incorporating all aspects of tourism linkages to the livelihoods of local community members. Likewise, an annual survey will be conducted to document the changes in host community's day to day life from tourism.

6.3 Capacity Building

PA management involves the need to address complex issues with regard to the sustainability of the biodiversity conservation. Thus, CA staff member should have a range of skills on technical as well as managerial aspects of PA management. Thus, the capacity building programs could be focused at individual, institutional, and community levels. The capacity-building initiatives as part of PA management often target individual managers and aim to promote their professional development by building on existing knowledge and experience, and by providing new concepts and tools to address contemporary challenges such as climate change variabilities, early warning system, fire management etc. Such training should be of two categories: (i) training for organizational capacity building, and, (ii) training for specific target group focused capacity building. The capacity enhancement of the CBOs and KrCA staff members is seen as the basis for effective conservation of blackbuck in KrCA. However, no specialized training packages have been offered thus far to the members of the UGs/UCs and KrCA staff members in this regard. The general training program for the members of local CBOs include account and book-keeping; leadership and enterprise development; planning-monitoring and organization development, and management. Likewise, the specific training to CBOs and KrCA staff includes Training of Trainers, planning, implementation, monitoring and evaluation.

Promoting collaborative partnerships and sharing of institutional knowledge to build capacity for effective blackbuck conservation remains a point of discussion, especially regarding the best management intervention. In this regard, partnerships could be sought with national and international conservation organizations for capacity enhancement. Training needs assessment will be undertaken at various levels to identify and design priority areas for curriculum development and implementation. In view of the current context, the following areas will be important to be included in the training curriculum:

For Frontline Staff

- Orientation training for game scouts on legal issues
- Wildlife management/handling techniques
- Blackbuck count on regular basis
- Basic training on field equipment like GPS
- Orientation training on social mobilization
- Basic training on vegetation quantification to record

data on the monitored plots
- Wildlife health condition assessment
- Fire-fighting techniques

For Rangers

- Applicable software for wildlife management especially database and GIS
- Certificate course in wildlife management
- Training of Trainers (general and specialized)
- Training on nature interpretation and display management
- Training on participatory planning and monitoring

For Conservation Officers

- Personnel management and legal procedures
- Training on organization development and management
- Training on GIS and remote sensing
- Diploma course in wildlife management
- Training on conflict management

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CHAPTER

7

Blackbuck Conservation Program

7.1 Status, Significance and Conservation Efforts

The population of blackbuck at Khairapur is in a stable state. However, there were ups and down before this population reached the present stage. The number of blackbuck in Khairapur in 1975 was only nine individuals. Of the four sub-species found in the sub-continent *Antelope cervicapra centralis* is found in central India, *Antelope cervicapra rajputani* is found in India north-western Indian and Pakistan, *Antelope cervicapra cervicapra* is found in South India *Antelope cervicapra rupicapra* is found in Uttar Pradesh of India and Nepal -Mungall 1978). With the setting up of joint guard post of BNP and DFO of Bardiya at Khairapur the blackbuck number reached to 113 in 1998. But in 1999, it declined to 50 as several herds of blackbuck moved away from its habitat as the tall grass could not be managed. It was assumed that they migrated to the Indian side as no traces of their presence were found within 3 km radius of Khairapur. Since then, the number grew again and reached to 191 in 2008. KrCA was established in 2009 and it started conservation initiatives in partnership with conservation communities. From 2011/012 KrCA started building fences to restrict blackbuck population within the core habitat and reduce crop depredation by it in the adjoined crop fields. By the end of 2016, its number reached to 252 (Table 2).

TABLE 2: NUMBER OF BLACKBUCK IN KrCA SINCE 1975

Year	No. of Blackbuck	Year	No. of Blackbuck	Year	No. of Blackbuck	Year	No. of Blackbuck
1975	9	1986	152	1997	113	2007	185
1976	23	1987	164	1998	113	2008	191
1977	38	1988	170	1999	50	2009	219
1978		1989	177	2000	53	2010	225
1979		1990	177	2001	56	2011	280
1980	23	1991	177	2002	74	2012	287
1981	38	1992	150	2003	92	2013	300
1982		1993	109	2004	85	2014	274
1983	66	1994	111	2005	107	2015	230
1984	100	1995	109	2006	131	2016	252
1985	130	1996	101				

Source: KrCA 2017

Table 3 below shows the population of blackbuck in the months of FY 2073-2074 (2016-2017).

TABLE 3: NUMBER OF BLACKBUCK IN DIFFERENT MONTHS OF FY 2073-2074

Month	Male	Female	Fawn	Total
Ashad 2073	68	127	57	252
Shrawan	60	125	56	241
Bhadra	55	122	55	232
Ashwin	45	119	55	219
Kartik	66	151	0	217
Mangsir	66	151	0	217
Poush	63	150	0	213
Magh	61	149	0	210
Falgun	61	148	0	209
Chaitra	63	143	51	257
Baisakh	62	143	55	260
Jestha	61	142	54	257
Ashad	58	141	58	257

Source: KrCA 2073/74

Significance

Blackbuck (*Antelope cervicapra*), locally known as Krishnasar, is a protected wildlife of Nepal and it is also listed in Appendix III of CITES. Blackbuck is one of the most beautiful Asiatic antelope and is a member of Bovidae family. The white and black pelage and spiral horn of a male are quite attractive to look at. People enjoy watching the animal jump. This gregarious animal gathers in herds. The size of the herd varies with time, season and availability of food. This animal used to graze alongside cattle since the times of Lord Krishna. "Krishnasaar" constitutes two words "Krishna" and "shyahar," or care of Krishnasaar. It is believed that He cared for the animal. Members of local Yadav community also care for this animal. Hindus consider it a holy animal, especially by the members of the Yadav community.

Conservation Efforts

Blackbuck was once a common wildlife throughout the Indian sub-continent. It was distributed throughout West Pakistan along the foothills of the Himalayas from Punjab (Pakistan) through Uttar Pradesh (India) and Nepal to West Bengal (India) and Bangladesh (Lydekker 1924 cited in Chand 1999). The blackbuck became extinct from Bangladesh and Pakistan in 1970s and 10 animals were re-introduced from Texas, USA (Burton and Burton 1987) to Pakistan. In Nepal, blackbucks were once commonly found in Kanchanpur, Kailali, Bardiya and Banke districts in 1960s (Pradhan et al. 1999). However, it was once considered extinct until few blackbucks were sighted in Khairapur of Bardiya districts by Krishna Man Shrestha (then warden of Royal Karnali Wildlife Reserve) and Erick Dinerstein in 1975. After that the DoF coordinated with DNPWC and DFO of Bardiya to set up a guard post to protect the blackbuck population. During 1993-1996 the Government took an initiative for the requisition of private land by paying compensation to the owners of the land. However, the issue of illegal settlers and encroachers in the *ailani* land could not be resolved due to political problems. In 2009, KrCA was declared and its office was established at Khairapur. Similarly, KrCAMC was also formed to increase local people's participation in blackbuck conservation. Since then, KrCA has been protecting the blackbuck with the support of conservation communities.

7.2 Issues

7.2.1 Encroachment of Core Blackbuck Habitat

a. The shrinkage of core blackbuck habitat has decreased the core area
b. Demarcation of boundary and fencing the area has been difficult due to delay in resolving the resettlement of illegal settlers and encroachers, resulting in the creation of open areas at some places
c. Conflict between CA authority and community members as blackbuck occasionally raids crops around the core area and in encroached areas converted into agricultural fields

7.2.2 Management of Grassland During Rainy Season

During the rainy season, the grass grows tall and provides cover for predators like leopard and hyena to hide and prey on blackbuck. Thus, KrCA allows local people to bring their livestock to graze at several blocks of the CA on rotational basis for a certain period, which leaves short grass for the blackbuck. Similarly, local people are permitted to cut grass in the same manner as a management intervention. The movement of local people during the period disturbs the blackbuck for a few days but it allows short grass all over the habitat. Despite the management of grassland during the rainy season, the mortality rate of blackbuck is found to be high in this season. Table 4 shows the number of deaths of blackbuck during the months of the FY 2073-2074 along with the causes of death. It was found that 63 blackbucks died in the FY 2073/74 due to various reasons. Fifty percent of the mortality was that of the males. Similarly, during the rainy season,most of blackbuck predation was done by leopard followed by hyena.

Table 4 shows that most of predation during the rainy season was done by leopard which is 59% followed by hyena 15%. It is also observed that in between three months (Shrawan-Ashwin), 23 male blackbucks were predated by leopard. This shows that grassland has to be managed urgently in the rainy season to provide blackbuck with their preferred short grass and decrease predation. On the other hand, if the predation by leopard increases, a study will have to be undertaken to prescribe measures—either to add other ungulates as prey species or dart predator species and release them in BNP to protect this source population of KrCA.

7.2.3 Intrusion of Invasive Alien Species

In the aftermath of floods of 2071, there was an eruption of additional invasive species, replacing blackbuck's palatable short grass species. The treatment of various invasive species has not been undertaken.

7.2.4 Degradation of Grassland

a. Overgrazing by local livestock has exerted pressure in the core blackbuck habitat and has degraded the grassland
b. Local people are often found collecting grass favored by blackbuck

7.2.5 Degradation of Wetlands

a. *Ipomea* species has invaded wetlands and affected the wetland ecosystem
b. The floods of 2071 has brought too much silt in the wetlands
c. Local community members are found to be fishing in the wetlands

TABLE 4: DEATH OF BLACKBUCK AND ITS CAUSE IN THE FY 2073-2074

Month	Number of death					Cause of Death				
	Male	Female	Fawn	Total		Leopard	Hyena	Dog	Natural	Disease
Ashad 2073										
Shrawan	8	2	1	11		5	2	0	0	4
Bhadra	5	3	1	9		9	0	0	0	0
Ashwin	10	3	0	13		12	0	0	0	1
Kartik	0	1	0	1		0	1	0	0	0
Mangsir	1	0	0	1		1	0	0	0	0
Poush	3	1	0	4		0	2	1	1	0
Magh	2	1	0	3		3	0	0	0	0
Falgun	0	1	0	1		1	0	0	0	0
Chaitra	0	3	7	10		2	3	0	5	0
Baisakh 2074	1	0	2	3		1	1	0	1	0
Jestha	1	1	1	3		1	0	1	1	0
Ashad	3	1		4		4	0	0	0	0
Total	**34**	**17**	**12**	**63**		**39**	**9**	**2**	**8**	**5**

Source: KrCA 2073/74

7.2.6 Inadequate Community Participation in Conservation Activities

Community participation is inadequate due to:

a. Lack of expected economic benefit from KrCA
b. Inadequate conservation awareness
c. Insufficient capacity of conservation communities

7.2.7 Inadequate Human and Financial Resources for Conservation

a. Lack of guard posts and the ensuing security measures on the part of the staff
b. Lack of motivation/incentives for local staff
c. Insufficient budget allocation
d. Unavailability of emergency fund, especially in the cases when fiscal year has already begun

7.2.8 Human - Blackbuck Conflict

Crop damage by blackbuck is the major cause of resentment towards the KrCA authority. Crop damage often results from insufficient food inside the KrCA in summer/ winter and incomplete fencing to contain blackbuck. This has adversely affected the economy of the local people. Farmers seek compensation from KrCA when they find their crops damaged by the blackbuck. However, it is difficult to estimate the actual extent of crop damage by blackbuck because local cattle also damage crop.

7.2.9 Problem of Genetic Loss

Before the blackbuck of Khairapur reached the present number of 252, the conservation effort had begun with only nine individuals in 1975 – with lots of in breeding among them. The present population was made possible only with the continued effort of the government. No evidence has been obtained thus far to confirm the genetic loss. However, genetic variety of the present lot should be tested and bred with other variety to conserve this source population.

7.3 Strategies

- Development of an integrated blackbuck action plan to ensure additional/outside funding and support from various conservation partners
- Collaboratation with DLSO to vaccinate local livestock to prevent the transfer of communicable disease to blackbuck from local cattle and vice-versa
- Institutional strengthening of conservation communities (UGs, FOs, UCs, KrCAMC and NGOs) for participatory blackbuck conservation in coordination and in collaboration with various partner organizations
- Integration of livelihood interventions with integrated conservation and development model to increase local participation in blackbuck conservation
- Integration ofinformation, education and communication by developing a strategy to increase awareness among local people
- Coordination with key stakeholders to conserve blackbuck and for the development of a network with conservation partners in knowledge generation and management together with the pooling of resources for conservation and development

7.4 Activities

- Updating of flora and fauna of KrCA
- Relief distribution to people affected by human-wildlife conflict
- Construction of a well-equipped rescue centre for injured blackbuck
- Control of domestic dogs entering the core area of KrCA
- Construction of *Kanji* house at two additional posts and maintenance of existing ones
- Treatment of and providing food for injured blackbucks
- Translocation of blackbucks to similar habitats of other PAs
- Exchange of blackbucks to improve the breed
- Training on livestock management
- Vaccination of local livestock in consultation with DLSO
- Conduct a program in coordination with DLSO to encourage stall-feeding and replacing unproductive livestock
- Purchase of necessary equipment such as binoculars, high resolution camera and GPS

CHAPTER

8

Tourism and Interpretation

8.1 Background

The link between PAs and tourism is as old as the history of PAs. Protected areas are established primarily for the preservation of wildlife populations, their habitat, natural landscape, and the cultural heritage of the surrounding areas. Tourists visit these PAs to understand and appreciate the values for which such areas are established and to gain personal experience. PAs need tourism, and tourism needs PAs. Though the relationship is complex and sometimes adversarial, tourism is always a critical component to consider in the establishment and management of PAs.

Nowadays, tourism has become a major sector of economic activity which indicates it will continue to grow in the years to come. This growth and new trend is expected to provide positive contribution for the conservation and development of potential surrounding areas and the communities living there through meaningful travel experience, including such aspects as cultural authenticity, contact with local communities, and learning about local flora, fauna, special ecosystems and natural life in general, and the importance of their conservation.

Tourism in PAs should not be limited to providing recreational opportunities for visitors and generating revenue. It should be an effective means to raise awareness among visitors through nature education and the maximization of benefit to local communities as well as in eliciting public support for conservation. Thus, the objective of tourism in KrCA should be aimed at enriching visitors' experience as well as informing them on conservation needs and their anticipated role in protecting natural and cultural heritages for the future generation too. Interpretation is a process of communicating message on natural and cultural heritage by using objects, artifacts, landscapes and sites. Information is simply a fact whereas interpretation is an art of disseminating information. Thus, interpretation is not the message we communicate to visitors but it is all about how we communicate it. Interpretation enhances the understanding of visitors about PA and the need for its conservation. They are supposed to appreciate nature and, in turn, support to conserve it.

Tourism in PAs should be developed and managed at a level that benefits conservation. It is evident that tourism generates revenue for conservation and conservation promotes tourism. Sustainability of conservation will be enhanced if tourism could support for the livelihoods of local people. The issue here is how to create a win-win situation. Promotion of eco-tourism can serve this purpose. Tourism with environmentally responsible travel to experience nature, promoting conservation, while also economically contributing to local communities is regarded as eco-tourism. Thus, tourism in PAs should be ecologically sustainable, economically viable and socially acceptable,which will ultimately enhance wilderness experience and contribute to conservation and livelihoods of local communities.

8.1.1 Tourism Scenario

KrCA was established in 2009 A.D. but it has not become a major tourist destination as yet. However, the trend of tourists visiting the KrCA is increasing, and, most of the tourists are Nepalese (Table 5). The number of tourists visiting KrCA in the FY 2072/73 was 14050. Moreover, the number in the FY 2073/74 reached 16905. The table shows that 99% of the visitors are Nepalese. Out of the Nepalese visitors most are students on educational tour. In order to increase the number of Nepalese visitors apart from students, the entrance fee should be lowered to boost the value of KrCA. The reasons behind insignificant number of international visitors are lack of tourism infrastructure and available tourism services and facilities. The private sector is also not attracted to tourism business here because of those reasons. There is also a need to lower the rate of entrance fee for Nepalese visitors at KrCA and increase its significance. Tourism products at KrCA are also insignificant. All the available activities include nature walk and sighting of blackbuck from the watch towers. Only after spending three to four hours

at the CA, visitors leave the place on the same day. Similarly, there is no efficient transportation service from Nepalgunj to Khairapur and vice versa. If visitors arrive late they face the problem of food and accomodation. There is only one home stay available here. Overall, there should be a good publicity of KrCA to attract visitors.

8.1.2.3 Airport

The nearest airport is at Nepalgunj of Banke District – at about 45 km (one-hour drive) away from Khairapur of Bardiya.

8.1.2.4 Telecommunications

KrCA can be connected by both Public Switched Telephone Network (PSTN) and mobile network of Nepal Telecom and NCELL. The mobile coverage in KrCA is satisfactory. In addition, there is also internet facility to browse internet and use email.

TABLE 5: NUMBER OF TOURISTS AT KrCA IN THE FY 2073- 2074

Month	Nepali	SAARC countries	Foreigners	Grand Total
Shrawan 2073	992	6	4	1002
Bhadra	982			982
Ashwin	1495		3	1498
Kartik	1021		13	1034
Mangsir	2141		1	2142
Poush	2040			2040
Magh	1757		4	1761
Falgun	1747	1	6	1754
Chaitra	1590		10	1600
Baisakh 2074	1839		1	1840
Jestha	892		1	893
Ashad				
Total	**16856**	**7**	**42**	**16905**

Source: KrCA, Monthly report of 2073

8.1.2 Tourism Infrastructure

8.1.2.1 Roads

KrCA headquarters could be reached by a 500m blacktopped link road from the national highway. In place of a dirt road in the middle of core area an access road has been built in the eastern border of KrCA. The fire-line which was built to contain and prevent forest fire from spreading is also used as an access road. The present south-north and east-west fire line from the middle of KrCA core area could be used for jungle drive in the future. There is also a fire line close to the boundary of KrCA, the condition of which is not good at present and cannot be used during the rainy season. More fire lines should be built inside the KrCA for monitoring purposes. Similarly, a circular, access ring road should also be built just outside the blackbuck habitat area and the boundary of the CA for tourism purposes.

8.1.2.2 Public buses

After reaching Nepalgunj via air or bus, KrCA could be reached by long-distance buses that run from Nepalgunj to Gulariya, Taratal and Rajapur. One can also travel the 40 km distance from Neplagunj to Khairapur in a private vehicle. It is very important to run public bus service from Nepalgunj to KrCA, so that visitors can come directly to CA without any hassle.

8.1.3 Tourism Services

8.1.3.1 Accommodation and meals

There are hotels in Gulariya – the District HQ, but there is only one home-stay in the periphery of KrCA to provide accommodation and food. More tourism operators should be encouraged to run hotel outside the KrCA.

8.1.3.2 Shopping

At present there is no specific outlet near KrCA where visitors can buy souvenir or local handicraft items. However, there are shops in Gulariya, where they can buy some local items. Gulariya is 5 km away from the CA. Interested local people could be encouraged to operate shops in KrCA, where visitors can buy souvenirs and local handicraft products.

8.1.3.3 Banks/ currency exchange

There are several branches of banks in Gulariya and at least one bank will be contacted to operate ATM service near KrCA.

8.1.3.4 Transport services
There are three fuel filling stations in Gulariya Municipality.

8.1.3.5 Medical services
Medical services are available in Gulariya, which is district headquarter of Bardiya district.

8.1.3.6 Interpretation facilities
Currently, there are limited interpretation facilities available in and around KrCA. There is no established Visitor Information Center at Khairapur but the post at the main entrance provides brief information on various aspects of blackbuck conservation, codes of conduct inside CA. One multi-purpose VIC will be constructed with the facilities of ticket counter, information dissemination hall, documentary hall, souvenir shop and refreshment centre.

8.1.4 Issues
- Lack of tourism infrastructure in and around KrCA
- Lack of private entrepreneurs to operate hotels and restaurants
- Limited conservation awareness program for local community and visitors

8.2 Tourism Management
8.2.1 Strategies
- Development of tourism infrastructures in and around KrCA
- Promotion of private entrepreneurs to operate tourism business
- Promotion of tourism facilities available in the CA by marketing it in a package such as nature walk, and bird watch, while also exploring the potentials of eco-friendly tourism in off-route areas as well
- Collaboration with BNP to make a circular tourism route
- Celebration of the birthday of Lord Krishna with religious activities

8.2.2 Institutional Set-up
The development of tourism increases revenue; stimulates the development of new tourism enterprises along with various related activities; promotes and encourages local producers and service providers; and opens new markets. Moreover, it will improve the standards of life of local people, allows CA employees to acquire new knowledge and skills, and generates revenue to be ploughed back for environmental protection. KrCA will take the lead role in encouraging private investors and community organization to operate hotels for food and accommodation. It will also encourage tour guide operators, owners of transport service to operate jungle (jeep) drive and travel agents to operate bus from Nepalgunj to Khairapur. Likewise, the community organizations will be encouraged to perform cultural shows for visitors and initiate bank and health services.

8.2.3 Impact Minimization
The tourism in KrCA is yet to flourish. However, the CA will work closely with agencies that provide tourism facilities and services to minimize negative impacts onto blackbuck conservation. The possible negative impacts on the CA could be the trampling of soil and grass, noises that could frighten blackbuck; traffic congestion en route from Nepalgunj to Taratal/Rajapur. There could also be an impact on local tradition, culture and arts and crafts. Influx of large numbers of visitors may also disrupt what was once a quiet and peaceful way of life of local communities. In order to make tourism a positive force various management and monitoring measures should be adopted to manage and guide its proper development.

8.2.4 Tourism Products Diversification
Tourism development at KrCA is in progress as various tourism products have been identified along with infrastructure development. KrCA will work with BNP to diversify tourism products of BNP in such a way that that the tourists who visit BNP will also visit KrCA. This will be done with the dissemination of information on KrCA in the VIC of BNP. Similarly, tourism operators of BNP will also be encouraged to include a visit of KrCA in their travel itinerary.

8.2.5 Nature Interpretation
Through nature interpretation we can pass on knowledge about nature and the relationships within it which, in turn, will promote an in-depth insight, respect, commitment as well as care and consideration for the natural world and cultural environment.
- Train and provide cetificate to nature guides, giving priority to local people
- Enhance nature guides' capacity of nature interpretation, especially on blackbuck, birds and endemic plants through trainings and experience sharing activities
- Initiate conservation focused program in schools through Eco-Clubs and support them by designing a specific course in nature conservation and involving them in conservation awareness activities

8.2.6 Tourism Activities
- Construction of VIC with souvenir shops, restaurant, entrance ticket counter, documentary showing hall, watch tower and public toilets, including toilet for differently- able visitors
- Construction of watch towers
- Maintenance and repair of watch towers
- Construction of jungle trails for visitors to observe blackbuck
- Launching of clean-up campaign in and around CA and Babai drainage

- Support for cultural conservation committee to set up cultural museum
- Impart nature guide training
- Conduct home-stay and housekeeping training
- Conduct cook training
- Erection of signboards at relevant locations around Nepalgunj, Ranjha airport, Gulariya
- Production of KrCA brochure
- Provide fellowships to journalist to visit KrCA and publish article
- Initiation of exchange visits of tourism entrepreneurs of KrCA and BNP
- Publiction of news and articles in newspapers on blackbuck
- Production of video documentary on blackbuck conservation

CHAPTER

9

Special Programme

9.1 Climate Change Adaptation

9.1.1 Context

The Himalayan regions are highly vulnerable to the impacts of global climate change and uncertainties over climate in the form of increased occurrences of floods and extreme events as well as extended dry spells. These changes are expected to result in shifts in vegetation, species extinctions, and changes to ecosystem service delivery, with consequential cascading, downstream impacts on human livelihoods and lives (Shrestha et al., 2012). Nepal's National Adaptation Plan of Action (NAPA) predicts warmer winter temperatures and increased winter and monsoon precipitation in the country, which will occur in unpredictable and severe weather events (MoE 2010). Given these predicted trends in climatic conditions and their socio-ecological consequences, it is important to integrate un/expected impacts into protected area management plans and strategies. But, because of the uncertainties associated with trajectories of climate change, the plans should be adaptive and include 'no-regrets' strategies that will have conservation benefits even if climate change trajectories do not unfold as predicted (Hannah et al. 2002). The disastrous floods of Babai River in 2071 B.S. inundated Bardiya district including KrCA, killing 40 blackbucks. A similar flood occurred again in 2074 B.S in which 18 blackbucks were killed. These floods and inundation has resulted in the emergence and spread of new invasive plant species inside KrCA.

9.1.2 Climate Change Vulnerability Assessment of Socio-ecological Systems

Climate Change Vulnerability Assessments (CCVA) is emerging tools in the fields of management of natural resource management under climate change. By assessing climate change vulnerabilities and considering risk in the context of other existing environmental stressors (e.g. poaching, encroachment, human-wildlife conflict, infrastructure development), natural resources managers can identify those species, habitats and human communities which are relatively more vulnerable or resilient to climate change, ascertain why they are vulnerable or resilient, and use the information to realign management priorities (Glick et al. 2011). The vulnerability of a species, systems, or resources to climate change can be considered a starting point for conservation efforts and a characteristic brought about by other stressors (e.g., anthropogenic) that is exacerbated by climate change (O'Brien et al. 2004). The assessment of social systems includes a review of practices, planning, and policies. For natural systems, climate resilience is determined by the intrinsic values of the system to cope with climatic variability. Where there is limited information available on species, systems and resources within the KrCA, the vulnerability assessment might suggest research or monitoring to fill in that knowledge gap.

The most widespread reaction to Climate Change Adaptation (CCA) is, "how does it differ from what we are already doing?" In many ways, CCA may be considered a process rather than a final product. CCA relates to why and how processes are undertaken such that climatic factors are explicitly considered; thus, the outputs from CCA may not be different than current best practices for resource management, but with the explicit difference that climate change is considered in both its impacts on the resource (vulnerability), as well as the fact that the practice remains resilient under high levels of uncertainty. This requires practices to be evaluated and considered jointly as part of a larger adaptive management plan. Through the combination of climate impact and resilience evaluations, a vulnerability assessment can identify climate-related risks and thereby show whether current actions are already sufficient or major changes are needed.

9.1.3 Participatory Vulnerability Assessment of KrCA

During the process, qualitative assessment based on the biological characteristics of some of the key focal (both flora and fauna) species were employed. Since, all the species recorded in KrCA are not primary conservation targets, the assessments focused on blackbuck and its

associated habitat. A consultation workshop comprising of stakeholders and experts was held in Khairapur to identify climate vulnerable species of conservation importance, and other socio-economic features that require interventions to reduce vulnerabilities and increase resilience. The climate vulnerability of the socio-ecological units was assessed and scored for sensitivity to climate-related triggers, adaptive capacity, and exposure to climate change and consequent natural disasters. The units were then ranked based on the assigned scores, and conservation management strategies developed for the highly vulnerable units in the prescribed management strategies and activities.

Species

KrCA has a very small number of mammal species such as blackbuck, palm squirrel and hare, monkey, langur, fox, hyaena, jungle cat, wild boar, jackal etc. Some of them are visiting animals. The blackbuck as the primarily targeted wildlife of conservation importance inhabits in open grassland, scrubland and lightly-wooded areas as well as in the fringe areas along the agricultural fields. This species needs water daily, and is thus restricted to areas where surface water is available for the greater part of the year. Confined population of blackbuck with no connectivity to other habitable areas, whose habitat is highly vulnerable to impacts of prolonged droughts and recurring floods, are highly vulnerable to impacts of climate variabilities and changes, and could be adversely affected by availability of surface water and forage.

Ecosystems

Only three ecosystem units were identified and assessed for climate vulnerability. Of these, grasslands and wetlands (rivers and ponds) were ranked as being highly vulnerable to climate change. Blackbucks are habitat specialists that require open grasslands with specific communities of grass. However, the grasslands are dynamic systems that are highly sensitive to changes in precipitation and moisture (Peet et al. 1999). Since they occur in flood plains, grasslands are susceptible to floods and river cutting and to fire during long dry seasons. Therefore, the habitats for this species are vulnerable, both temporally and spatially to climate change. Wetlands (rivulets and ponds) were also considered to be highly vulnerable to climate change. Bardiya district shows an increasing annual precipitation trend with significant increase in monsoon precipitation based on an analysis of climatic data from 1971-2014 (DHM 2017). Climate projections indicate that precipitation could be erratic, occurring as extreme weather events, which could also cause floods during periods of high rainfall as evident from two devastating floods in last five years in Babai catchment, interspersed with extended dry periods due to delayed onset of monsoon.

Human communities, livelihoods and infrastructure

The projected temperature and precipitation changes due to climate change can also make the lives and livelihoods of the communities difficult, causing decreased productivity, greater exposure to natural disasters, diseases, and loss of social connectivity. The social sector consists of vulnerability assessments of ten major settlements within the KrCA. Of these, Jainpur, Bichpari and Gujrana are identified as highly vulnerable to the impacts from climate change based on the participatory assessment. These communities, concentrated in small areas are considered highly vulnerable to climate change-induced natural disasters mainly flooding. The underlying causes of vulnerability and poverty have not been addressed and there are no disaster management strategies in place though some of the settlements have informal community institutions and NGOs working within their communities. Gender responsiveness and inclusiveness in awareness and participation in adaptation programs is very low, and women and marginalized sections are not included adequately in decision- making.

Agriculture, livestock rearing followed by daily-wage earning, foreign employment, small scale trade, and services are the major sources of livelihoods of the communities living in and around KrCA. The most vulnerable sources of livelihoods/ activities to climatic stressors (as perceived by local communities based on ranking) are agriculture and livestock rearing. Agriculture (farming and livestock) will be severely affected by climate change as precipitation regimes become more unreliable and erratic (Dahal et al. 2009). Currently, most of the farming practices in the area are traditional with very limited access to irrigation facilities and extension services despite their proximity to market centers. Even now, food sufficiency for many communities is limited to 6-9 months. Lack of innovation and introduction of new technologies in the area puts agriculture under higher vulnerability. The KrCA has infrastructures such as rural roads/black topped road, key settlements, suspension bridge, fencing of the conservation area and market center. Rural roads within the conservation area and core area are highly vulnerable to flooding. Likewise, most of the settlements in KrCA are highly vulnerable to flooding as they are located within flooding zones as it was evident in recent floods. These settlements are inadequately protected by structures against flooding.

9.1.4 Issues

Major issues of concern in the face of likely impacts of climate change at KrCA are:

- Extended dry spells and drying up of wetlands and water holes
- Drying of grasslands
- Recurrence of floods due to erratic rainfall pattern and extreme weather events

- Inundation of grasslands and human settlements during floods
- Drowning and deaths of blackbuck due to floods
- Emergence and spread of invasive species in recent years
- Inadequate preparedness for flood disasters
- Extended dry spells, increasing fire risks

9.1.5 Strategies

- Setting up of disaster management committees and linking them with climate change and adaptation related institutions to tackle climate-related effects
- Formal and informal arrangements for collective security against the effects of climate change
- Integration of disaster management and adaptive responses in training curriculum
- Capacity building of staff members and conservation communities
- Promotion of land use planning and livelihood diversification
- Establishment of linkages with district service providers in agricultural areas (including livestock rearing areas) for rescue response in disasters and relief actions

9.1.6 Activities

- Preparation of Local Adaptation Plan of Action for user committees of CA
- Undertaking vulnerability assessment with regards to climate change
- Construction of embankment, spur or any soil conservation measure in Babai River to protect blackbuck from flood waters
- Study on the impacts of changes in precipitation and temperatures in KrCA
- Piloting an early warning system of flash floods in Babai River
- Carrying out of flood rescue and fire control preparedness
- Setting up of a Floods Risk Management Committees and providing support to institutionalize it
- Monitoring of the impacts of climate change on indicator species
- Construction of elevated mud mounds at strategic areas to avoid natural depressions in lowlands and to facilitate excessive flow during high floods
- Identification and prioritization of local adaptation measures that are based on adequate knowledge and technology
- Preparation of a forest fire management plan and its integration with the forest fire control component of the operation plan of CFUG
- Plantation in private and public lands to maintain a balance between fuel wood demand and supply for local households
- Scaling up of biomass energy technologies for less fuel wood consumption
- Promotion of biogas in the households around KrCA
- Facilitation of market linkages and voluntary carbon financing
- Create awareness and impart orientations to members of local communities on climate change impacts on natural environment, ecosystem services, and their livelihoods

9.2 Solid Waste Management

9.2.1 Context

Most of the solid waste generated in and around CA is composed of organic matter, paper, and minor reused waste that are mainly reused for cattle feeding and manure, while disposal of other non-degradable categories of collected waste (glass, metal, and plastic) is not properly managed. Particularly, burning in open dumps may pose a great hazard to environmental, human, and animal health. The pollution problem is now no longer confined to solid waste. Water sources along the major trails are being contaminated from improper affluent discharge, human waste, and garbage dumping. Sewerage and toilet waste can be found piped into nearby streams and rivers.

9.2.2 Issues

- Garbage management is an ongoing challenge to keep CA region clean despite the fact that several initiatives are already in place
- Inadequate knowledge on proper disposal and recycling of the solid waste among stakeholders
- Inadequacy of coordinated effort to address the issue of garbage and pollution in the KrCA
- Lack of guidelines for properly managing the garbage
- Inadequate fund to maintain proper sanitation in the KrCA

9.2.3 Strategies

- Development of guidelines on clean water, sanitation and hygiene for stakeholders in KrCA
- Use of Eco-Clubs to raise awareness on the importance of solid waste management
- Working in conjunction with conservation partners to implement sanitation programs

9.2.4 Activities

- Management of garbage with special focus on reducing production, recycling, and destruction by prohibiting the use of polluting items such as plastic bags
- Providing water supply, toilets, drainage, collection and recycling centers at schools, public buildings, and households with the support of conservation partners
- Support for Eco-Clubs to organize clean-up campaign regularly
- Monitoring of local home-stay and lodges to ensure that they follow the sanitation guidelines

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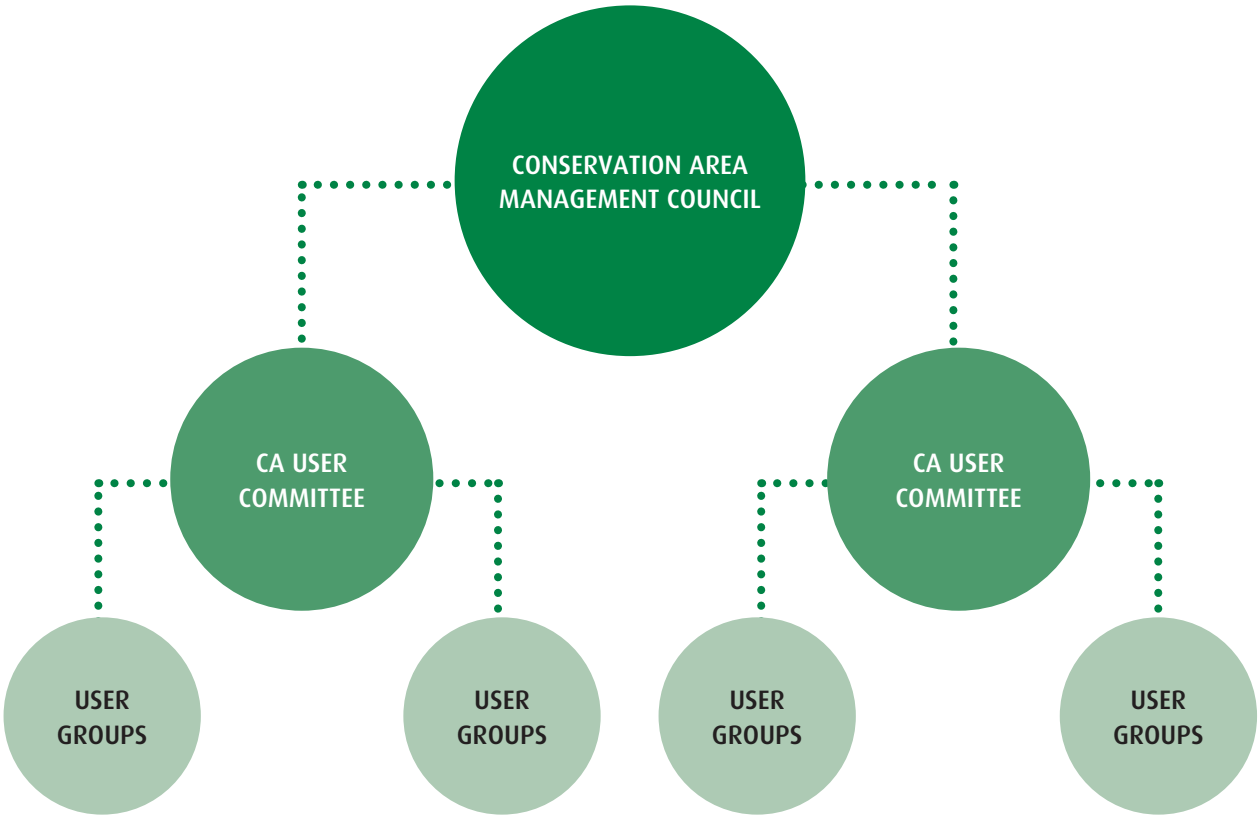
CHAPTER

10 Community Engagement

10.1 Introduction

National Parks and Wildlife Conservation Act, 1973 introduced the concept of community participation and legislated the Conservation Area Management Rules (Government Managed) in 2000. Conservation Area means an area to be managed according to an integrated plan for the conservation of natural environment and balanced utilization of natural resources. CA is an area with core area, forests, agricultural lands, settlements, village open spaces and any other land use practices. The CA program in Nepal is a strategy to make local people responsible for all natural resources in the region as custodians rather than dislocating them from the region for the sake of biodiversity protection. This made the people both, the principal actors and beneficiaries to see that the resources are utilized in a sustainable manner to benefit generations. The National Parks and Wildlife Conservation Act 1973, and the Conservation Area Management Rules (Government Managed) 2000 provide policy and legal framework for CA management in Nepal.

FIGURE 11: STRUCTURE OF CONSERVATION AREA MANAGEMENT COUNCIL



KrCA was declared in 2009 with an area of 16.95 km^2, presently covering parts of ward number 1,2,3,4,5 of Gulariya municipality in Bardiya. The KrCA has a population of about 9000 from 1669 households. They are the principal stakeholders. KrCA has institutionalized mechanisms to mobilize funds, minimize biotic pressures in the CA resources and motivate communities in the participatory management of forest resources to fulfil their needs of forest products. The Krishnasaar Conservation Area Management Council (KrCAMC) is the apex body under which four Conservation Committees (CCs) and 86 (UGs) have been formed and institutionalized (Figure 11).

The long-term objective of CA program is to motivate local people and to win their support to involve them in nature conservation. The legislation has made a provision of channeling 30-50% of the CA revenue to local communities for the implementation of conservation and community development activities. The programs of the CA are aimed at conservation, community development, skill development and income generating activities. They also include activities such as conservation awareness, gender and special target group mainstreaming, capacity building and institutional strengthening. Out of the total budget 30% will be allocated for conservation, 30% for community development, 20% for income generation and skill development, 10% for conservation education and 10% for administrative costs.

In the fiscal year 2073/74, KrCA generated NRs. 70650.00 (Table 6) and contribution of tourism was only 60%. In order to generate more revenue, the entrance fee for Nepalese should be lowered. Similarly, each livestock should be levied a minimum charge for entering in the core habitat for grazing. In addition to this, certain amount should be charged to the HHs that collect grass from the core area. In order to levy a charge for grass collection and grazing, a KrCA management regulation should be prepared and approved. It will not only generate revenue but also control grazing and grass collection inside the core habitat of blackbuck.

10.2 Past and Present Management Practices

10.2.1 Forest Management

There are two patches of forests in and around KrCA, of which one serves as the habitat for wildlife other than the blackbuck. Another patch of forest has been handed over to local CFUG. In the past, the area was under general management while the forest was under the control of DFO. Before the declaration of KrCA, the conservation of blackbuck was done only in the core area without any

TABLE 6: REVENUE OF KrCA IN 2073/74 (NRs)

Month	Fine	Entrance fee	Selling of tender form	Others	Total
Shrawan 2073	0	4600	0	0	4,600
Bhadra	10300	0	0	0	10,300
Ashwin	1000	3000	0	0	4,000
Kartik	0	13000	0	0	13,000
Mangsir	0	1000	7800	0	8,800
Poush	3800	0	0	0	3,800
Magh	0	6000	0	0	6,000
Falgun	1500	4100	0	0	5,600
Chaitra	150	9000	0	0	9,150
Baisakh 2074	3000	1000	0	400	4,400
Jestha	0	1000	0	0	1,000
Ashad	0	0	0	0	0
Total	**19750**	**42700**	**7800**	**400**	**70650**

special arrangements for its management outside the CA. But, at present, the entire area of CA is viewed from the perspective of wildlife conservation and the programs are directed towards the conservation of blackbuck including other wildlife and birds. This area is considered as additional habitat for wild animals.

10.2.2 Other Land-use

The major land use in KrCA other than grasslands and forested areas is human settlements and agricultural lands.

10.3 Management Strategies

10.3.1 Zonation

Conservation Zone/Habitat Zone

The large forest patches in CA is equally good as core area for wildlifeto use as cover. Thus, these areas will be basically managed as extended wildlife habitat where extraction of forest products will be restricted but the area will be allowed for regulated tourism activities.

Sustainable Use Zone

The forested area in CA which is managed by community for dual purposes of meeting the needs of forest products for local households and providing refuge for dispersing population of wildlife. This falls under this category of zonation.

Intensive Use Zone

This is the area in the CA, including all the settlements and private lands, where environment-friendly development activities will be carried out to enhance the livelihoods of local people living in the area through various developmental inputs. This area of the CA has been duly notified and clearly delineated.

10.3.2 Community Development

The objective of providing need-based and site-specific inputs for the socio-economic development in the areas that fall outside the core areasis to reduce local people's dependency on forest resources. The management is oriented towards garnering support of local people through need-based socio-economic development input and participatory forest management for fulfilling their needs of forest product. Site specific plans, including livelihoods support initiatives, will be the guiding document for implementing developmental initiatives in the respective conservation committees and user groups.

10.3.3 Biodiversity Conservation

One of the major objectives of the concept of CA management is to develop partnership between CA and local people for biodiversity conservation. The involvement and active participation of local people is the main thrust of biodiversity conservation not only in core area but also outside the core area. Local people will be made aware of the importance of biodiversity conservation and several programs will be launched, focusing on its different aspects.

10.3.4 Functional Coordination

The plan for each CC/UG will be prepared through bottom-up planning process. Participation of women and the members of under-privileged communities will be ensured in its planning and implementation. A participatory ranking of the users will be done based on their well-being and the proximity of the settlement to the KrCA in order to prioritize their needs and the support that will have to be provided. Prior to the approval of this, KrCAMC will review the plan for its refinement and alignment with the activities that will be supported by other line agencies.

10.3.5 Tourism Promotion

The objective of promoting community-based eco-tourism outside the core area is to develop it as a means of sustainable local livelihoods. The periphery of core area of KrCA has its own tourism potential and there are several home-stays for visitors. However, there are only a few eco-tourism attractions outside the core area. Thus, potential areas for the diversification of tourism products will be explored.

10.3.6 Capacity Building

CA staff members need to be trained in facilitation skills and adopting participatory approaches. Likewise, the frontline staff members also need training in the use of basic field instruments for wildlife management with special focus on blackbuck conservation. The in-house orientation training should be focused on participatory management. Detailed human resource development activities will be planned to include in-house workshops, training programs and capacity building courses. It will also include lectures by resource persons and will be aimed to improve the skills of and to positively change staff members' perceptions, while also improving their professionalism in CA-people cooperation and participatory management.

10.3.7 Conflict Minimization

The reduction of human-wildlife conflict that arises outside the core area is important to ensure cordial relations between the CA and local people. Though human-blackbuck conflict is not a pronounced issue, yet there are a few reported cases of crop damage by wildlife (as recorded in the CA). Thus, crop depredation by blackbuck in the community land has remained a management issue.

10.3.8 Income Generation and Skill Development

In order to reduce local peoples' dependency in the CA for forest resources while also uplifting their standards

of living at the same time, income generation and skill development activities will be carried out by targeting the marginalized communities. KrCAMC's fund will be made available to conduct these programs.

10.3.9 Conservation Education

In order to develop positive attitude in local people for biodiversity conservation, several programs will be conducted, focusing on different profiles of the society, e.g. school children, mother groups, social activists etc. For this, resources will be made available from the 50% of the income of KrCA.

10.3.10 Regulation of Forest Products

The management and conservation of the resources of community forest is a matter of great concern. The demand of the forest resources right from fuel wood to timber is regarded as a major challenge in managing forest resources.

10.3.11 Implementation and Mainstreaming Strategy

For the effective implementation of the plan, all the programs will be implemented through conservation committees. The basic implementation strategy will be to:

- Ensure the participation of all stakeholders
- Follow the good governance practices such as maintaining transparency and making well-informed decisions
- Promote green development in CA through organic farming, use of biogas, plantation and other green technology that reduces carbon footprint
- Build capacity for institutional sustainability

The mainstreaming of the said strategies in CA will include protection of blackbuck; management of blackbuck habitats; regular monitoring of blackbuck and other wildlife species; regulation on the collection of forest products and livestock grazing; and conflict minimization and paying compensation for wildlife damage.

10.4 Activities

- Support for institutional strengthening of conservation communities
- Support for KrCA communities to prepare a five-year plan
- Construction of an alternate route for the benefit of local community members of Panditpur outside of core area
- Support for hume pipe in the road to discharge stagnant water
- Provide support for the installation of biogas
- Promote crops that are not preferred by blackbuck
- Development of a livelihoods improvement strategy
- Production of bio-briquette by using invasive species of grass
- Provide fire-fighting equipment to CFUG
- Organization of learning Visit for KrCA staff in other PAs that have blackbuck
- Educational tour for the members of conservation committee(s) to observe and learn about participatory biodiversity conservation and the role of tourism in the improvement of local livelihoods
- Celebration of Conservation Days
- Production of Information Education and Communication (IEC) material

CHAPTER

11

Activity, Budget and Logical Framework

11.1 Activity and Budget

The required budget for the implementation of the activities prescribed for a period of five years including that of the KrCAMC and CC is estimated and presented in Annex V. The summary of the activities and budget of the management plan for KrCA for the period of five years (2074/75-2078/79) is presented in Table 7. For the implementation of the said activities NRs. Twenty Two Crore Thirty Two Lakhs Seventy Six Thousands Nine Hundred and Thirteen (NRs. 22,32,76,913) will be required, giving much weightage to habitat management which will be around 20.10% of the total budget followed by18.80% for protection, 11.74% for study and research and 10.98% for tourism development. Budget proposed for KrCAMC is 7.79% as there are only four UCs and the revenue generation from tourism and other activities is very low.

TABLE 7: ACTIVITY HEADINGS AND THE BUDGET OF THE FIVE-YEAR KrCA MANAGEMENT PLAN

(Amount in thousand rupees)

S.N.	Activities	Year I	Year II	Year III	Year IV	Year V	Total Amount	%
1	KrCA protection	18875	7986.5	9120.5	3012	2973	41967	18.80
2	Habitat management	12125	8557.5	7287.5	8542.5	8370	44882.5	20.10
3	Species conservation	2852.5	2258	2639.875	3565.375	4200.5	15516.25	6.95
4	Fire management	2175	2163.75	2942.5	3478.75	1080	11840	5.30
5	Wildlife health management	1225	1418.75	962.5	1006.25	1050	5662.5	2.54
6	Encroachment management	7750	1630	1760	1150	0	12290	5.50
7	Study and Research	4300	5930	5350	4238	6400	26218	11.74
8	Tourism Development	2810	7242.25	9457.8	1362.1	3641.4	24513.55	10.98
9	Climate change adaptation	2550	2887.5	2420	2875	3837	14569.5	6.53
10	Solid waste management	950	1418	1097	1722	1514	6701	3.00
11	Community Development	3665	3022.5	3138.25	3577.41	3992.66	17395.82	7.79
12	Office Management	330	441	363	288	300	1722	0.77
	Total	**59,608**	**44,955**	**46,539**	**34,816**	**37,359**	**223,277**	**100**

The budget mentioned in Table 7 only includes the program budget. Thus, in Table 8, the estimated amount of administrative cost (Salary, travel allowance, dress and ration) is also presented and it shows that 17.9% of budget is allocated for administrative cost, while 82.10% is allocated as program cost. The budget allocated by the Government for the first year is only 33.43% (the estimated Government allocation is at two crores twenty-five lakh per year out of which Rs. Seventy-Three Lakhs Thirty-Nine Thousand is administrative budget) against the required budget, which increases and reaches up to 48.74% by the end of the year. In the first year, the plan envisions to pay compensation for the eviction of the illegal settlers and encroachers, which also includes the construction of office building which, in turn, makes the program budget high. On an average the allocated budget is 45.84% and thus 54.16% of the deficit budget will have to be sought from conservation partners.

Again, the summary budget does not include the budget (around seven crore) for management council and four users committee since KrCA generated only NRs. 70650.00 (Table 6) as revenue in 2073/74. Some of the UC-level activities could be supported by district line agencies and the UCs will have to try to seek that at the local Government level as well. Similarly, conservation partner organizations can also support to activate these UCs to increase their participation in blackbuck conservation. In addition to this, the Government should also allocate some funds to those protected areas whose revenue is very negligible.

TABLE 8: ACTIVITIES AND BUDGET OF KrCA INCLUDING SALARY AND OTHER BENEFITS (IN THOUSAND RUPEES)

Budget heading	Year					Total	%
	1	2	3	4	5		
Salary+Travel Allowance+Dress+Ration	7705.95	11008.5	8072.9	8439.85	8806.8	44034	16.47
Program Cost	59607.5	44955.25	46539.18	34816.23	37358.76	223276.91	83.53
Total	**67313.45**	**55963.8**	**54612.1**	**43256.08**	**46165.56**	**267310.91**	**100**
Government allocation in percent	**33.43**	**44.67**	**50.36**	**52.02**	**48.74**		**45.84**

TABLE 9: ACTIVITY AND BUDGET OF KrCAMC AND KRISHNASAAR USER COMMITTEE

S.N.	Activities	Year I	Year II	Year III	Year IV	Year V	Total
1	**KrCAMC**						
	Conservation Program	1300000	0	550000	575000	52500	2477500
	Community Development Program	500000	0	0	0	0	500000
	Income generation & Skill Development	130000	31500	33000	34500	36000	265000
	Conservation Education Program	470000	678500	242000	510500	729000	2630000
	Administrative Cost	498000	280150	287300	294450	341600	1701500
	Sub Total	**2898000**	**990150**	**1112300**	**1414450**	**1159100**	**7574000**
2	**Dashrath Krishnasaar UC**						
	Conservation Program	410000	325500	341000	356500	372000	1805000
	Community Development Program	400000	1515000	385000	345000	420000	3065000
	Income generation & Skill Development	230000	271500	270000	365000	266250	1402750
	Conservation Education Program	285000	89250	38500	253000	141500	807250
	Administrative Cost	394000	282450	296438	310989	426134	1710011
	Sub Total	**1719000**	**2483700**	**1330938**	**1630489**	**1625884**	**8790011**

S.N.	Activities	Year I	Year II	Year III	Year IV	Year V	Total
3	**Radhakrishna Krishnasaar UC**						
	Conservation Program	675001	677251	440000	460000	426134	2678386
	Community Development Program	750000	945000	1150000	450000	470000	3765000
	Income generation & Skill Development	310000	348000	776750	264500	216000	1915250
	Conservation Education Program	55000	357750	57500	358750	30000	859000
	Administrative Cost	394000	282450	296438	310989	426134	1710011
	Sub Total	**2184001**	**2610451**	**2720688**	**1844239**	**1568268**	**10927647**
4	**Babai Krishnasaar UC**						
	Conservation Program	3040000	3192000	3344000	3496000	4148000	17220000
	Community Development Program	2910000	1628000	3396000	619000	1872000	10425000
	Income generation & Skill Development	325000	580750	220000	484500	240000	1850250
	Conservation Education Program	40000	52500	55000	57500	42000	247000
	Administrative Cost	394000	282450	296438	310989	426134	1710011
	Sub Total	**6709000**	**5735700**	**7311438**	**4967989**	**6728134**	**31452261**
5	**Sarju Krishnasaar UC**						
	Conservation Program	400000	795000	320000	230000	240000	1985000
	Community Development Program	500000	315000	1530000	600000	1055000	4000000
	Income generation & Skill Development	225000	526250	461500	430500	522700	2165950
	Conservation Education Program	150000	102500	107500	155250	42000	557250
	Administrative Cost	394000	282450	296438	310989	426134	1710011
	Sub Total	**1669000**	**2021200**	**2715438**	**1726739**	**2285834**	**10418211**
	Total	**15179001**	**13841201**	**15190800**	**11583908**	**13367219**	**69162129**

11.2. Logical Framework Analysis

The logical framework of KrCA Management Plan is as shown in Table 10:

TABLE 10: LOGICAL FRAMEWORK OF KrCA MANAGEMENT PLAN

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
Goal			
Enhance blackbuck conservation benefiting local to global communities	• Blackbuck population at KrCA is improved with greater habitat area • The illegal settlers are relocated outside the core area • Livelihood of local people improved	• Annual progress Report • Progress Report of conservation partners • Human Development Index reports • Living standard survey reports • Study Reports and Research Papers	• Supportive policy and priority of the GoN • No occurrence of natural disaster especially flood
Purpose			
1. To safeguard blackbuck population by resolving resettlement issues, especially by relocating illegal settlers and encroachers elsewhere and improving existing habitat to conserve the source population of blackbuck	• The illegal settlers happy in GoN allocated land outside core area, • Increased population of blackbuck due to improved habitat by controlling invasive species and restoration of wetlands	• Annual progress Report • Progress Report of conservation partners • Study Reports and Research Papers • Articles in the newspaper • Documentary	• Adequate budget and staff provided to implement management activities

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
2. To conserve blackbuck together with other associated flora and fauna	• Updated database of flora and fauna • Enhanced protection and conservation activities	• Annual progress Report • Progress Report of conservation partners • Study Reports and Research Papers	• Effective coordination, collaboration and networking with stakeholders
3. To promote tourism in KrCA through development of tourism infrastructures, diversification of tourism products as well as providing facilities and organizing events to attract tourists that benefit the local community	• Increased joint venture, tourism related activities, projects and programs • Increased visitors' satisfaction • Increased tourism related employment opportunities	• Economic survey reports • Study Report and Research Papers • Media reports • DNPWC reports	• Conservation- friendly tourism promotion
4. To enhance participatory blackbuck conservation initiatives through conservation communities by supporting them in conservation, community development, skill development and conservation awareness raising	• Social and Economic development of local community improved • Increased conservation awareness • Conservation communities are strengthened and institutionalized	• Annual progress Report • Progress Report of conservation partners • Study Reports and Research Papers • Interview of local people in newspaper, radio and TV • Best Practices and Lesson Learnt Reports	• Communities are unified and positive to cooperate
5. To build and strengthen capacity of KrCA and conservation communities to deliver services effectively and efficiently	• The KrCA authority delivers both technical and management services effectively and efficiently • The delivery of services provided by Conservation committees are improved	• Annual progress Report • Progress Report of conservation partners	• The staff members are not frequently transferred • Staff motivation is continued
Output 1			
1.1. The settlers inside the core area are relocated elsewhere in a win-win strategy, and the final boundary is demarcated	• The 142 households receive land outside the core	• The land ownership certificate received from GoN, Progress Report of KrCA	All the HHs accept the proposed resettlement area
1.2. The habitat of blackbuck is maintained and improved to support viable blackbuck population 1.3. Weeds infestation is controlled 1.4. Wetlands are restored	• The 400 ha. of grassland maintained • 125ha. of land freed from invasive species of grass and 10 wetlands restored	• KrCA habitat monitoring report, Progress Report, • Research reports	Climate change does not induce additional invasive species

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
Output 2			
2.1 The blackbuck population is increased together with associated wildlife 2.2 Local livestock are vaccinated every year in coordination with DLSO 2.3 Blackbucks are translocated to other PAs after feasibility study in collaboration with conservation partners	• No. of blackbuck maintained and increased • No. of local livestock vaccinated • No. of blackbucks translocated to similar habitats of other PAs	• Regular count of blackbuck, progress report, monitoring report • Progress report, DLSO progress report • Translocation report, progress report, research report	Disease is well controlled by vaccination and is not transferred to blackbuck from local livestock
Output 3			
3.1 Visitors are benefitted by upgraded Visitor Information Centre, blackbucks are sighted well through walking trail, visitors enjoy boating operated in wetlands outside the core area 3.2 Hotels, restaurants are opened, Regular buses from Nepalgunj-Khairapur-Nepalgunj are operated, publicity of KrCA is done by various means 3.3 Cultural events are organized, cultural museum is established	• No. of tourism product developed • No. of hotel and restaurants opened in and around KrCA • Documentary is produced • News and article are covered by various TV channel and newspapers • No. of various cultural events offered to tourist • No. of cultural museums established	• Progress report • Conservation partners progress report • Tourism products • No. of tourism services operated • Clippings of news articles • Cultural Museum	Political stability is maintained and improved
Output 4			
4.1 Forest and grassland is developed in public land 4.2 Water and sanitation situation improved. Local people are benefitted by education and health service, income of special target group is increased 4.3 Local people adopt self- employment after receiving skill development trainings, economic activity in and around KrCA is increased	• Ha. of forest and grassland in public land • No. of drinking water scheme supported to community people • No. of toilets supplied by water facility • No. of students adopt hand washing before and after meals • No. of children going to school • No. of people benefitted by health post	• Progress report • Monitoring report • Progress reports of other GoN offices • Project completion reports • Public audit reports • Meeting minutes	There is adequate parcel of public land

Narrative Summary	Objectively Verifiable Indicators (OVI)	Means of Verification	Risk / Assumption
4.4 Participation of local people in blackbuck conservation activities increased	• No. of people operating small enterprises • No. of people involved in conservation activities		
Output 5			
5.1 KrCA staffs and Conservation Committee members are trained in technical and management aspect 5.2 Law enforcement is smooth without any conflict	• 24 KrCA staff and 36 Conservation Committee members benefitted • Number of cases of conflict between KrCA and community members reduced following law enforcement	• Training reports, • Progress reports • Records of conflict between KrCA and community members maintained	Political members cooperate with KrCA

Activities	Budget (NRs.)
1. KrCA Protection • Construction of headquarter (HQ) office building • Construction of post at Panditpur • Construct staff quarters at Khairapur • Construction of KrCA entrance gate • Repair and maintenance of office building at the HQ, guard posts and staff quarters • Supply of electricity at office buildings and guard posts • Construction of fire-line • Gravelling of fire-lines • Maintenance and repair of fire-lines • Installation of CC cameras where the forest adjoins grassland and at strategic locations to monitor predator • Maintenance of CC cameras • Habitat reclamation by cleaning the debris following the eviction of encroachers • Demarcation and fencing of the core area • Maintenance and repair of fence • Promotion of bio-fence by planting bamboo, babul, asuro • Provide necessary logistic support to staff for patrolling • Procurement of 5 night vision binoculars for monitoring at nights • Procurement of 30 bicycles for posts • Procurement of three motorbikes for guard posts • Procurement of one four-wheel-drive vehicle for day-to-day operation and management • Maintenance and repair of vehicles • Fuel for vehicle	4,19,67,000
2. Habitat Management • Procurement of tractor and equipment for grassland management • Grassland management by hiring a tractor (before tractor is procured) • Establishment of permanent plots to facilitate blackbuck's access to palatable grass • Cultivatation of kimbu or other crops as an alternate food for blackbucks • Control of invasive species by uprooting • Removal of *ipomea* from wetlands and the old drain made by Babai River • Plantation of Bird favoured bar, pipal, swami at the periphery of the Babai drain • Construction of waterholes	

Activities	Budget (NRs.)
• Maintenance and repair of wetlands and holes • Installation of solar water pump to irrigate grassland in the hot and dry season • Ground pipe fitting for irrigation • Maintenance and repair of pump used for boring groundwater • Construction of additional raised mud mounds • Improvement of raised mud mounds • Support for the operation of Nursery • Creation of grazing land in public land outside the core area to reduce grazing pressure in it • Creation and restoration of wetlands outside the core area to provide water to local livestock • Implement river training activities around the Babai River with the support of Local Government to control recurring floods which inundates KrCA	4,48,82,500
3. Species Conservation • Update on the Flora and Fauna of KrCA • Compensation to local people who are affected by human- wildlife conflict • Construction of a well-equipped rescue Center for injured blackbucks • Control on domestic dogs entering theKrCA core area • Construction of Kanji house at two additional posts • Maintenance of Kanji house • Treatment of and food for injured blackbucks • Translocation of blackbucks to similar habitats of other PAs • Exchange of blackbucks to improve their breed • Livestock management training • Vaccination of local livestock in consultation with DLSO • Conduct programs in coordination with DLSO to encourage stall-feeding and replacing unproductive livestock • Celebration of World Biodiversity Day on May 22 • Purchase of binoculars • Procurement of high resolution digital camera • Purchase of G.P.S	1,55,16,250
4. Fire Management • Preparation and implemention of fire-fighting management plan • Identification of fire prone areas by using mapping based on satellite imagery analysis or using the web-based fire mapper • Conduct training programs for KrCA staff and local people on fire-fighting techniques • Carry out controlled burning activities in fire prone areas before the onset of fire season • Provide fire-fighting equipment to guard posts and CFUGs • Mobilization of fire-fighting team (consisting of CA staff and local people) with necessary equipment to stop the spreading of fire in grasslands • Construction of four dual purpose ponds which will provides water for blackbuck and other wildlife species including birds, and, also to extinguish forest fire • Construction/installation of fire hydrant supported by solar pump near the artificial ponds • Raising awareness on fire prevention and forest fire control • Setting up of fire occurrence reporting and statistical database system	1,18,40,000
5. Wildlife Health Management • Establishment of wildlife rescue centre at the CA HQ for emergency treatment of injured animals • Treatment of injured blackbucks at the rescue centre with the help of BNP/DLSO	56,62,500

Activities	Budget (NRs.)
• Yearly vaccination of local livestock in coordination with conservation partners and DLSO against possible diseases that could be transferred to wildlife • Support for the establishment of a community-based veterinary center with necessary equipment material required in medical emergencies • Organize and impart training for frontline staff on monitoring, recording and reporting on disease or poor health conditions of blackbuck • Conduct postmortem of dead wild animals with the support of BNP or district veterinary office • Assessment of cases of blackbuck mortality to document the emergence and spread of disease • Regular monitor of water quality of wetlands and waterholes	
6. Encroachment Management/Settlement Management • Keeping updated data on registered land, illegal settlers and encroachers in the *ailani* land • Formation of a settlement management committee to address the issues relating to registered land, illegal settlers in unregistered land and encroachers • Organize an all party meeting to resolve the resettlement issues • Work with committee formed by MoFSC and prescribe possible solution • Providing compensation for the owners of registered land • Provide support to improve the livelihoods of the landless and flood victims who have encroached the CA for various reasons, and evict them in a win-win situation	122,90,000
7. Study and Research • Preparation of a zonation map of KrCA with proper delineation of facility zone, utility zone core zone and community development zone • Assessment of permanent plots • Study on population dynamics, animal health and diseases • Study on carrying capacity of blackbuck in KrCA • Study on blackbuck predators in KrCA and its impact on blackbuck conservation • Conduct a study on the need for livestock grazing as part for grassland management for the growth of short grass • Study on the possible disease that could be transmitted from domestic animals to blackbuck • Preparation of a list of invasive species and prescribe ways to control them • Conduct study on treating and controlling invasive species • Study on the use of invasive species of grass to produce tourist products so as to convert weeds into wealth • Conduct study to find out whether genetic loss has been happening in blackbuck, • Study on the impacts of climate change on blackbuck habitat with a specific focus on grasslands and invasive species after floods and droughts • Study on the effect of arsenic containing ground water on blackbuck's health which is pumped from underground • Study about human-wildlife conflict caused by problem animals • Assessment of translocated blackbucks and other potential areas for future translocation • Study on water quality and its impact on animals • Study on the impacts of tourism in KrCA • The relationship between the intensity of anthropogenic activities and health of viable blackbuck populations • Study on management effectiveness of KrCA • Evaluation of the five-year KrCA management plan 2074/75-2078/79 • Preparation of the five- year KrCA management plan 2079/80-2083/84 • Conduct IEE of management plan 2079/80-2083/84	2,62,17,500

Activities	Budget (NRs.)
8. Tourism Management • Construction of VIC with souvenir shops, restaurants, entrance ticket counter, documentary showing hall, watch towers and public toilets, including toilet for differently-abled people • Construction of watch towers • Maintenance and repair of watch towers • Construction of jungle trails for visitors to observe blackbuck • Organize clean-up campaigns in and around CA and the Babai drainage • Support for cultural conservation committee to set up cultural museum • Impart nature guide training • Conduct training on home stay and housekeeping • Conduct cook training • Erection of signboards • Production of KrCA brochure • Provide fellowship to journalist to visit KrCA and publish articles • Exchange visits of tourism operators of KrCA and BNP • Set up display and hoarding boards of KrCA in Ranjha airport • Make a KrCA hoarding board in Nepalgunj • Publication of news and article in newspapers on KrCA • Production of video documentary on blackbuck	2,45,13,550
9. Climate Change Adaptation • Preparation of Local Adaptation Plan of Action for municipalities and rural municipalities of CA • Undertake vulnerability assessment regarding climate change • Construction of embankment, spur or adoption of other soil conservation measures around the Babai River to protect blackbucks from floods • Study on the impacts of changes in precipitation and temperatures in KrCA • Pilot early warning system of flash floods in the Babai River • Carry out preparedness activities for flood rescue and fire control • Form a Flood Risk Management Committee and provide support to institutionalize it • Monitor the impacts of climate change on the indicator species of wildlife • Construction of elevated mud mounds at strategic sites to avoid natural depressions and lowlands to facilitate excessive flow of water during high floods • Identification and prioritization of local adaptation measures, based on knowledge and technology • Preparation of forest fire management plan and integration of forest fire control in the OP of CFUG • Plantation in private public lands to maintain a balance between fuelwood demand and supply for local households • Scale up biomass energy technologies for less fuel wood consumption • Promotion of biogas for the households in and around KrCA • Facilitatation of market linkages and voluntary carbon financing • Create awareness and organize orientation programs for the members of local communities on the impact of climate change onlocal environment, ecosystem services, and their livelihoods	1,45,69,500
10. Solid Waste Management • Management of garbage with special focus on reducing the production of recycling, and its destruction, by prohibiting the use of polluting items such as plastic bags • Provide support for water supply, toilet, drainage, and by setting up collection and recycling centers at schools, public buildings, and households with the support of partner conservation organizations • Support Eco-Clubs to regularly organize clean-up campaign • Monitoring of home-stays and lodges to ensure that they follow the sanitation guidelines	67,00,793

Activities	Budget (NRs.)
11. Community Development • Support for institutional strengthening of conservation communities • Support for KrCA communities for the preparation of a five- year plan • Construction of an alternate route outside the core area for the benefit of the communities of Panditpur • Provide support for hume pipes on the road to discharge stagnant water • Provide support for biogas installation • Promotion of crops that are unpalatable to blackbucks • Development of livelihoods improvement strategy • Production of bio-briquette using invasive species of grass • Provide fire-fighting equipment to CFUG • Learning visit of KrCA staff to other PAs with blackbucks • Educational tour for the members of conservation committee to learn participatory biodiversity conservation and role of tourism in livelihood improvement • Celebration of conservation days • Organize World Wildlife Week • Produce IEC material	1,73,95,821
12. Office Management • Purchase of computers • Purchase of multimedia projector • Office material management • Stationery • Management of furniture • Electricity, telephone, Internet	**17,21,500**
Total budget	**22,32,76,913**

11.3 Gender Equity and Social Inclusion

Gender inequality and social exclusion are issues of global concern. Over the last decade, Asia and the Pacific region have made a remarkable progress on these issues. Nepal is not an exception in this regard. Since last decade, it has been moving ahead by fulfilling all its commitments made in the international arena regarding non-discrimination, gender equality and social justice. In this regard, KrCA also needs to better its target to give the benefits of development to the marginalized segments of society.

KrCA will adopt GESI strategy as a core cross-cutting theme. The implementation of GESI strategy will be participatory and as inclusive as possible. At the program level the focus will be laid to identify whether the program is GESI responsive, embraces inclusive approaches in program appraisal, design, implementation, monitoring and evaluation. In terms of organizational preparedness, building conceptual clarity and operational skills for GESI issues is a common concern for all partners. The management plan will mainstream GESI strategy to engage and empower women and marginalized people in equitable benefit sharing through meaningful participation in participatory biodiversity conservation activities.

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ANNEXES

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ANNEX 1: PLANT SPECIES FOUND IN THE KrCA

क्रम सं S.N.	परिवार Family	वंश प्रजाति Botanical Name	फर्म Form	स्थानीय नाम Local Name	कैफियत Remarks
1.	Asclepiadaceae	*Calotropis gigantea*	S	आँक, मदार	
2.	Asclepiadaceae	*Calotropis procera*	S	आँक, मदार	
3.	Asteraceae	Parthenium hysterophorus	H	गाँजरे झार	
4.	Asteraceae	Artemisia vulgaris	H	तितेपाती	
5.	Anacardiaceae	*Lannea grandis*	TM	जिङ्गड	
6.	Amaranthaceae	*Achyranthes bidentata*	H	दतिवन, लटजीरा, चिरचिरा, उल्टाचक्च्यूरा	
7.	Amaranthaceae	*Amaranthus sp*	H	मेर्सा	
8.	Amaranthaceae	*Alternatharea sesselis*	H	भृङ्गराज, पनखरा	
9	Apocynaceae	*Alstonia scholaris*	T	छतिवन	
10	Apocynaceae	*Rauwolvia serpentina*	S	चांदमरुवा, सर्पगन्धा	
11	Acanthaceae	*Rungia parviflora*	S	उकुचे झार	
12	Bombacaceae	*Bombax ceiba*	T	सिमल	
13	Burseraceae	*Garuga pinnata*	TM	दबदबे, तुन	
14	Cucurbitaceae	*Trichosanthes sp*	C	वन चिचिण्डो,	
15	Cucurbitaceae	*Momordica sp*	C	वन करेला	
16	Cucurbitaceae	*Trichosanthes sp*	C	इन्द्रेणी	
17	Cannabaceae	*Cannabis sativa*	H	भाङ्ग	
18	Commelinace	*Commelina benghalensis*	H	काने, गहुँवा	
19	Compositeae	*Ageretum conyzoides*	N	गन्धे झार, राउन्ने, गनधाइला	
20	Compositeae	*Bidens pilosa*	H	भेडे कुरो	
21	Convolvulaceae	*Ipomea carnia*	S	बेसर्मा, बेसरम, बेहाया	
22	Chenopodiaceae	*Chenopodium album*	H	बेथे	
23	Cyperaceae	*Cyperus rotundus*	H	मोथे	
24	Cyperaceae	*Fimbrisrysis dichotoma*	H	ज्वाँनो घाँस	
25	Cyperaceae	*Fimbristylis falcota*	H	मोथे	
26	Cyperaceae	*Kyllinga brevifolia*	H	हाडा घाँस	
27	Dioscoreaceae	*Dioscorea bulbifera*	C	गिंठा, गिड्डा	
28	Dryopteridaceae (Aspidiaceae)	*Dryopteris sp*	Fern	निउरो, उन्यू, कोच्या	
29	Euphorbiaceae	*Mallotus philippinensis*		सिंदूरे, रोहिनी	
30	Euphorbiaceae	*Trewia nudiflora*		भेल्लर, गुटेल	
31	Euphorbiaceae	*Jatropha curcas*		सजीवन, निमतेल, भरभण्डा	

क्रम सं S.N.	परिवार Family	वंश प्रजाति Botanical Name	फर्म Form	स्थानीय नाम Local Name	कैफियत Remarks
32	Euphorbiaceae	*Ricinus communis*		अण्डिर, अरिन, रणकोहला	
33	Euphorbiaceae	*Euphorbia hitra*	H	दूधे झार	
34	Euphorbiaceae	*Phyllanthus virgatus*	H	अमला झार, अमेली	
35	Equisetaceae	*Equisetum debile*	H	आँखले झार, कुरकुरे, धोध्धी	
36	Gramineae (poaceae)	*Cynodon dactylon*	H	दुबो	
37	Gramineae (poaceae)	*Imperata cylindrica*	H	सिरु, भरुवा	
38	Gramineae (poaceae)	*Saccharum spantaneum*	H	काँस, राणा	
39	Gramineae (poaceae)	*Desmotachya bipinnata*	H	कुश	
40	Gramineae (poaceae)	*Bothriochloa ischaemum*	H	दुबेई बन्सो	
41	Gramineae (poaceae)	*Digiteria adscendens*		वन चाईना	
42	Gramineae (poaceae)	*Echinocloa colonum*	H	मोटो बन्सो	
43	Gramineae (poaceae)	*Eleusine indica*	H	कोरे, कोदे घाँस	
44	Gramineae (poaceae)	*Eragrostis atrovirens*	H		
45	Gramineae (poaceae)	*Hemarthria compressa*	H		
46	Gramineae (poaceae)	*Oplismenus compositus*	H		
47	Gramineae (poaceae)	*Plusospermum sp.*	H	धनियाँ/गाजरा घाँस	
48	Gramineae (poaceae)	*Vetiveria zizonoides*	H	जोभ, मेदीमोरिया	
49	Gramineae (poaceae)	*Sporobolus diander*	H		
50	Lamiaceae	*Colebrookia oppositifolia*	S	धुरसुल	
51	Lamiaceae	*Pogostemon bengalensis*	S	रुदिलो	
52	Leguminosae	*Acacia catechu*	T	खयर	
53	Leguminosae	*Dalbergia sissoo*	T	सिसौ	
54	Leguminosae	*Acacia concinna*	C/S	सिकाकाई, आइला काँडा	
55	Leguminosae	*Cassia tora*	S	टाप्रे, पँवार, चक्रमण्डी	
56	Leguminosae	*Alysicarpus vaginalis*	H	टिटिलो	
57	Leguminosae	*Vicia anguistifolia*	H	अँकारा	
58	Leguminosae	*Vicia hirsuta*	H	मुनमुन	
59	Leguminosae	*Leucaena leucocephala*	T	ईपिल ईपिल	
60	Malvaceae	*sida sp.*	H	पानपाते/जरि झार	
61	Menispermaceae	*Stephania elegans*	C	बाटुलपाते	
62	Menispermaceae	*Cassampegans pareioc*	C	बाटुलपाते	
63	Moraceae	*Ficus religiosa*	T	पीपल	
64	Moraceae	*Ficus bengalensis*	T	वर	
65	Moraceae	*Ficus benjamina*	T	समी	
66	Moraceae	*Ficus hispida*	S/T	खस्रेटो, कठगुलर	

क्रम सं S.N.	परिवार Family	वंश प्रजाति Botanical Name	फर्म Form	स्थानीय नाम Local Name	कैफियत Remarks
67	Moraceae	*Ficus glomerata (racemous)*	T	गुलर	
68	Moraceae	*Ficus sp*	S	सानो खस्रेटो	
69	Moraceae	*Ficus sp*	TS	गजपीपल	
70	Meliaceae	*Melia azedarach*	T	बकाइनो	
71	Meliaceae	*Azadirachta indica*	T	नीम	
72	Myrtaceae	*Syzygium cumini*	T	जामुन	
73	Myrtaceae	*Syzygium sp*	T	फरिम	
74	Myrtaceae	*Syzygium sp*	T	गहेन	
75	Malvaceae	*kydia calycina*	TS	बोहोरी, लासोर	
76	Nymphaeceae	*Nelumbium nuciferum*	AH	कमल, पुराइन	Aquatic herb
77	Oxalidaceae	*Oxalis corniculata*	H	चरि अमिलो, तिपतिया	
78	Onagraceae	*Ludwigia perennis*	H	ल्वांग झार, हराउवा घाँस	
79	Polygonaceae	*Persicaria hydropiper*	H	पिरेझार, सुलवारी	
80	Polygonaceae	*Persicaria nepalensis*	H	पिरेझार, सुलवारी	
81	Pontederiaceae	*Eichhornia crassipes*	H		Aquatic plant
82	Pedaliaceae	*Seasamum sp*	H	वन तिल	
83	Piperaceae	*Piper sp.*	H	लहरे करवट, गिठा	
84	Rubiaceae	*Wendlandia exserta*	TS	तिलका	
85	Rubiaceae	*Adina cordifolia*	T	कर्मा, करम, हल्दु	
86	Rubiaceae	*Hymenodictyon excelsum*	T	भुडकुल	
87	Rubiaceae	*Mitragyna parviflora*	T	फल्दु, टिकुल, टिकुई	
88	Rubiaceae	*Hedyotis biflora*			
89	Rhamnaceae	*Zizyphus jujuba*	S	बयर	
90	Rhamnaceae	*Zizyphus mauritiana*	TS	सीताबयर, बागीकाँडा	
91	Rhamnaceae	*Zizyphus sp*	TS	रुखबयर (खाने)	
92	Rutaceae	*Aegle marmelos*	T	बेल	
93	Rutaceae	*Murraya koenigii*	T	असारे, निमकठिया	
94	Rutaceae	*Glycosmis pentaphylla*	S	कागतीपाते, गुटुहुरु	
95	Solanaceae	*Solanum xanthocarpum*	H	कण्ठकारी, भरकठैया	
96	Solanaceae	*Solanum sp*	H	कण्ठकारी (प्याजी फूल फूल्ने)	
97	Solanaceae	*Solanum sp*	S	बिंही (तरकारी खाने)	
98	Scrophulariaceae	*Lindenbergia indica*	H	कन्चन	
99	Scrophulariaceae	*Lindernia sp.*			
100	Urticaceae	*Streblus asper*	TS	खागसी, छेहोर	
101	Umbelliferae	*Centella asiatica*	H	घोडताप्रे, ब्राह्मी	
102	Verbenaceae	*Lantana camara*	S	वनमारा,	
103	Verbenaceae	*Premna latifolia*	TS	सेतो गिनेरी, भैसबेल	

क्रम सं S.N.	परिवार Family	वंश प्रजाति Botanical Name	फर्म Form	स्थानीय नाम Local Name	कैफियत Remarks
104	Verbenaceae	*Premna integrifolia*	TS	काँडे गिनेरी, भैसबेल	
105	Verbenaceae	*Lippia nodiflora-phyla nodiflora*	H	कुरकुरे, कोक्ना	
106	Vitaceae	*Vites sp*	C	पुरेनी लहरा	
107	Verbenaceae	*Clerodendron infortunatum*	S	भाँटी, भाँट, भेंट	
108	Verbenaceae	*Callicarpa macrophylla*	S	दही काम्ले, भेटी	
109	Zygophyllaceae	*Tribulus terrestris*	H	गोखुर, गुम्मर	

ANNEX 2: MAMMALS FOUND IN KrCA

क्रम सं S.N.	परिवार Family	वंश प्रजाति Scientific Name	बोलाउने नाम Common Name	स्थानीय नाम Local Name	कैफियत Remarks
1	Felidae	*Felis chaus*	Jungle cat	वन बिरालो, ढाडे	
2	Felidae	*Panthera pardus*	Leopard	चितुवा	
3	Hyaenidae	*Hyaena hyaena*	Striped Hyana	हुँडार	संरक्षित
4	Canidae	*Canis aureus*	Golden JaKal	स्याल	
5	Canidae	*Vulpus bengalensis*	Bengal Fox	फुस्रो फ्याउरो	
6	Bovidae/Antilopinae	*Antelope Cervicapra*	Blackbuck	कृष्णसार	संरक्षित
7	Bovidae	*Baselaphus tragocamelus*	Bluebull	नील गाई/ घोडगडहा	
8	Cercopithecidae	*Macaca mulatta*	Rhesus macaque	रातो बाँदर	
9.	Cercopithecidae	*Semnopithecus hector*	Terai Grey Langur	तराई लंगुर	
10.	Suidae	*Sus scrofa*	Eurosian wild boar	बँदेल	
11.	Leporidae	*Lepus nigricollis*	Indian Hare	खैरो खरायो	
12.	Hystricidae	*Hystrix indica*	Indian creasted	जुरे दुम्सी	
13.	Herpestidae	*Herpestes edwardsi*	Indian Greymangoose	ठूलो न्याउँरी मूसो	
14.	Sciuridae	*Funambulus pennanti*	Nothern palm squirrel	पाँच धर्के लोखर्के	

ANNEX 3: BIRDS SPECIES FOUND IN THE KrCA

S.N.	English Name	Nepali Name	IUCN Category	Order	Family	Genus	Species
1	Ashy Prinia	टुप्टुक घाँसे फिस्टो	LC*	Passeriformes	Cisticolidae	*Prinia*	*socialis*
2	Asian Koel	कोइली	LC	Cuculiformes	Cuculidae	*Eudynamys*	*scolopceus*
3	Asian Openbill	घुँगीफोर गरुड	LC	Ciconiformes	Ciconidae	*Anastomus*	*oscitans*
4	Asian Paradise Flycatcher	स्वर्गचरी	LC	Passeriformes	Monarchidae	*Terpsiphone*	*paradisi*
5	Asian Pied Starling	डाइग्रे सारौँ	LC	Passeriformes	Sturnidae	*Gracupica*	*contra*
6	Baya Weaver	बया तोपचरा	LC	Passeriformes	Ploceidae	*Ploceus*	*philippinus*
7	Black Drongo	कालो चिबे	LC	Passeriformes	Dicruridae	*Dicrurus*	*macrocercus*
8	Black Francolin	कालो तित्रा	LC	Galliformes	Phasianidae	*Francolinus*	*francolinus*
9	Red Avadavat	रातो मुनियाँ	LC	Passeriformes	Estrildidae	*Amandava*	*amanadava*
10	Black -hooded Oriole	कालो टाउके सुनचरी	LC	Passeriformes	Oriolidae	*Oriolus*	*larvatus*
11	Black Ibis	कर्रा साँवरी	LC	Pelecaniformes	Threskornithidae	*Pseudibis*	*papillosa*
12	Black shouldered kite	मुसे चील	LC	Accipitriformes	Accipitridae	*Elanus*	*axillaris*
13	Blue-tailed bee eater	नीलपुच्छ्रे मुरलीचरा	LC	Coraciiformes	Meropidae	*Merops*	*philippinus*
14	Brahminy starling	जुरे सारौँ	LC	Passeriformes	Sturnidae	*Sturnia*	*pagodarum*
15	Brown capped pigmy woodpecker	पुन्टे कष्ठकुट	LC	Piciformes	Picidae	*Dendrocarpus*	*nanus*
16	Brown headed barbet	कुमछिर्के कुथुर्के	LC	Piciformes	Megalaimidae	*Megalaima*	*zeylanica*
17	Cattle eagret	वस्तु बकुल्ला	LC	Ciconiiformes	Ardeidae	*Bubulcus*	*ibis*
18	Chestnut bellied nuthatch	कटुसे मट्टा	LC	Passeriformes	Sittidae	*Sitta*	*cinnamoventris*
19	Chestnut shouldered patronia	पीतकण्ठे भँगेरा	LC	Passeriformes	Passeridae	*Petronia*	*xanthocollis*
20	Common hawk cuckoo	बीउ कुहियो	LC	Cuculiformes	Cuculidae	*Hierococcyx*	*varius*
21	Common hoopoe	फाप्रे चरा	LC	Coraciiformes	Upupidae	*Upupa*	*epops*
22	Common kestrel	बौंडाइ	LC	Falconiformes	Falconidae	*Falco*	*tinnunculus*
23	Common myna	डाइग्रे रुपी	LC	Passeriformes	Sturnidae	*Acridotheres*	*tristis*
24	Common quail	बट्टाई	LC	Galliformes	Phasianidae	*Coturnix*	*coturnix*
25	Eurasian collared dove	कण्ठे ढुकुर	LC	Columbiformes	Columbidae	*Streptopelia*	*decaocto*
26	Green-billed-malkoha	हरित मालकौवा	LC	Cuculiformes	Cuculidae	*Ceuthmochares*	*aereus*

S.N.	English Name	Nepali Name	IUCN Category	Order	Family	Genus	Species
27	Grey- bellied cuckoo	फुस्रो सानो कोइली	LC	Cuculiformes	Cuculidae	*Cacomantris*	*passerinus*
28	Grey francolin	कपिंजल तित्रा	LC	Galliformes	Phasianidae	*Francolinus*	*pondicerianus*
29	Great tit	चिचिल्कोट	LC	Passeriformes	Paridae	*Parus*	*major*
30	Greater racket-tailed drongo	भीमराज चिवे	LC	Passeriformes	Dicruridae	*Dicrurus*	*paradiseus*
31	Green bee -eater	मुरलीचरा	LC	Coraciiformes	Meropidae	*Merops*	*orientalis*
32	Grey brested prinia	फुस्रो छाती घाँसे फिस्टो	LC	Passeriformes	Cisticolidae	*Prinia*	*hodgsonii*
33	Himalayan flameback	तीन औँले लाहाँचे		Piciformes	Picidae	*Dinopium*	*shorii*
34	House crow	घर काग	LC	Passeriformes	Corridae	*Corvus*	*splendens*
35	House sparrow	घर भँगेरा	LC	Passeriformes	Passeridae	*Passer*	*domesticus*
36	House swift	फिरफिरे घर गौथली	LC	Apodiformes	Apodidae	*Apus*	*nipalensis*
37	Indian Grey Hornbill	सानो धनेश	LC	Coraciiformes	Bucerotidae	*Ocyceros*	*birostris*
38	Indian Robin	देवी श्यामा	LC	Passeriformes	Muscicapidae	*Saxicoloides*	*fulicatus*
39	Indian Pond Heron	आसकोट बकुल्ला	LC	Pelecaniformes	Ardeidae	*Ardeola*	*grayii*
40	Indian Roller	ठेउवा	LC	Coraciiformes	Coraciidae	*Coracias*	*benghalensis*
41	Jungle Babbler	बगाले भ्याकुर	LC	Passeriformes	Timallidae	*Turdoides*	*striata*
42	Jungle Crow	कालो काग	LC	Passeriformes	Corvidae	*Corvus*	*macrorhynchos*
43	Indian Courser	गाजले धावक	LC	Incertae sedis (disputed)	Cathartidae	*Sacroramphus*	*papa*
44	Large Grey Babbler	ठूलो बगाले भ्याकुर	LC	Passeriformes	Timallidae	*Turdoides*	*malcolmi*
45	Long-tailed Shrike	भद्राई	LC	Passeriformes	Laniidae	*Lanius*	*schach*
46	Oriental Magpie-Robin	धोबिनी चरा	LC	Passeriformes	Muscicapidae	*Copsychus*	*saularis*
47	Paddyfield Pipit	आली चुइयाँ	LC	Passeriformes	Motacillidae	*Anthus*	*rufulus*
48	Pied Bushchat	काले भ्याप्सी	LC	Passeriformes	Muscicapilidae	*Saxicola*	*caprata*
49	Wooly-necked Stork	लोभीपापी गरुड	NT**	Columbiformes	Columbidae	*Reinwardtoena*	*browni*
50	Plain Prinia	झाँक्री घाँसे फिस्टो	LC	Passeriformes	Cisticolidae	*Prinia*	*inornata*
51	Plaintive Cuckoo	पेट कैले कोइली	LC	Cuculiformes	Cuculidae	*Cacomantis*	*merculinus*
52	Red-vented Bulbul	जुरेली	LC	Passeriformes	Pycnonotidae	*Pycnonolus*	*cafer*

S.N.	English Name	Nepali Name	IUCN Category	Order	Family	Genus	Species
53	Red -whiskered Bulbul	श्वेतवक्ष जुरेली	LC	Passeriformes	Pycnonotidae	*Pycnonolus*	*jocosus*
54	Rose-ringed Parakeet	कण्ठे सुगा	LC	Psittaciformes	Psittaculidae	*Psittacula*	*krameri*
55	Rufous Treepie	कोकले	LC	Passeriformes	Covidae	*Dendrocitta*	*vagabunda*
56	Rufous -winged Bushlark	भारद्वाज	LC	Passeriformes	Alaudidae	*Mirafra*	*assamica*
57	Sand Martin	गलाहारी गौथली	LC	Passeriformes	Hirundinidae	*Riparia*	*riparia*
58	Scaly -breasted Munia	कोटेरो मुनियाँ	LC	Passeriformes	Estrildidae	*Lonchura*	*punctulata*
59	Spotted Dove	कुर्ले ढुकुर	LC	Columbiformes	Columbidae	*Spilopelia*	*chinensis*
60	Spotted Owl	कोचाल गाँडे लाटो कोसेरो	NT	Strigiformes	Strigidae	*Strix*	*occidentalis*
61	Common Tailorbird	पात सिउने फिस्टो		Passeriformes	Cisticolidae	*Orthotomus*	*sutorius*
62	Tawny-billed Babbler	घाँसे भ्याकुर	LC	Passeriformes	Timallidae	*Dumetia*	*hyperythra*
63	White-eyed Buzzard	जमल श्येनबाज	LC	Falconiformes	Accipitridae	*Butastur*	*teesa*
64	Zitting Cisticola	फिरफिरे	LC	Passeriformes	Cisticolidae	*Cisticola*	*juncidis*

LC* = Least concern
NT** = Near threatened

ANNEX 4: REPTILES SPECIES FOUND IN KrCA

S.N.	नेपाली नाम	English Name	Remarks
1.	मगर गोही	Mugger Crocodile	
2.	अजिंगर	Rock Python	
3.	गोमन सर्प	Binocellate Monocellate Indian Cobra	3 types
4.	करेत सर्प	Banded Krait Common Indian Krait	2 types
5.	धामिन	Rat Snake	
6.	दुई मुखे सर्प	Sand Boa	
7.	बाहुने सर्प	Green Snake	
8.	गोहुवा	Common Green Whip Snake	
9.	कछुवा	Indian Sawback	2 types
		East Asian Tortoise	
10.	सुनगोहोरो	Golden Monitor Lizard	
11.	बिचखोपरा	Jerdon's Snake -eye	
12.	छेपारो	Common Garden Lizard	

ANNEX 5: BOUNDARY OF KrCA PUBLISHED IN GAZETTE

North: Babai river

South: Hume pipe industry of blacktopped road of Tara Taal, Malaraiapur Taal, Chhedpur chowk, Agriculture service centre through Shiva chowk, Bargadahi chowk, Krishnasaar bus stand.

East: Krishnasaar bus stand, north-south gravel road, Bechaipur village, Dhurba High School chowk, Bechaipur village, Bindra Kanji house, East boundary of Bageshwori CF, Babai river.

West: Babari river, Bhagar Taal, Gujarana village chowk, hume pipe industry of Tara Taal road.

The boundary of core area is as follows:

The demarcation pillars that separate the core area from settlement:

North: Panditpur tole of ward number 2, and Bachaipur tole of ward number 4 of Gulariyo Municipality.

South: Gulariya ward number 3, Nimkathia tole and Khairanjhala tole of ward number 2.

East: Tulispur and Bachaipur tole of ward number 4 of Gulariya Municipality.

West: Jainpur tole of ward number 2 of Gulariya Municipality.

ANNEX 6: POPULATION AND HOUSEHOLDS DETAILS OF CONSERVATION AREA USERS COMMITTEE

S.N	Name of Users Committee	Number of Tole	As recorded in 2073			
			Population	Male	Female	Households
1	Dashrath Krishnasaar Users Committee, Gulariya-2, Bardiya	10	2106	1123	983	378
2	Radhakrishna Krishnasaar Users Committee, Gulariya-1 and 3, Bardiya	10	2168	1156	1012	411
3	Babai Krishnasaar Users Committee, Gulariya-2 and 4, Bardiya	11	2028	1019	1009	387
4	Sarju Krishnasaar Users Committee, Gulariya-3, Bardiya	12	2497	1286	1201	493
	Total	**43**	**8789**	**4584**	**4205**	**1669**

POPULATION AND HOUSEHOLDS DETAILS OF CONSERVATION AREA USERS GROUP

S.N	Address of Users Group	Name of Users Group Total Population	Total Population	Male Population	Female Population	HH Numbers/ Male Users Numbers	HH Numbers/ Female Users Numbers	Female Users Group Name
1	Gulariya Municipality-2, Ramnagar	Ramnagar Krishnasaar Users Group	215	112	103	34	34	Ramnagar Krishnasaar Users Group
2	Gulariya Municipality-2, Hanuman Tole	Hanuman Users Group	168	86	82	28	25	Hanuman Krishnasaar Women Users Group
3	Gulariya Municipality-2, Janak Tole	Janak Krishnasaar Users Group	136	77	59	34	29	Janak Women Krishnasaar Users Group
4	Gulariya Municipality-2, Parbati Tole	Parbati Krishnasaar Users Group	175	96	79	33	31	Parbati Women Krishnasaar Users Group
5	Gulariya Municipality-2, Bhaghar Tole	Bhaghar Krishnasaar Users Group	171	95	76	28	28	Bhaghar Women Krishnasaar Users Group
6	Gulariya Municipality-2, Gujrana	Gujrana Krishnasaar Users Group	389	194	195	55	55	Gujrana Women Krishnasaar Users Group
7	Gulariya Municipality-2, Milan Tole	Milan Krishnasaar Users Group	257	142	115	42	42	Milan Women Krishnasaar Users Group
8	Gulariya Municipality-2, Ganesh Tole	Ganesh Krishnasaar Users Group	248	124	124	54	54	Ganesh Women Krishnasaar Users Group
9	Gulariya Municipality-2, Krishna Tole	Krishna Krishnasaar Users Group	170	93	77	35	32	Krishna Women Krishnasaar Users Group
10	Gulariya Municipality-2, Shiva	Shiva Krishnasaar Users Group	177	104	73	35	33	Shiva Women Krishnasaar Users Group
			2106	**1123**	**983**	**378**	**363**	
1	Gulariya Municipality-1, Maleriyapur	Maleriyapur Krishnasaar Users Group	136	77	59	21	20	Maleriyapur Women Krishnasaar Users Group
2	Gulariya Municipality-1, Sunghava Tole	Sunghava Krishnasaar Users Group	157	83	74	36	36	Sunghava Women Krishnasaar Users Group
3	Gulariya Municipality-1, Rangi Tole	Rangi Krishnasaar Users Group	180	91	89	38	33	Rangi Women Krishnasaar Users Group
4	Gulariya Municipality-1, Chaudharypur	Chaudharypur Krishnasaar Users Group	189	99	90	38	38	Chaudharypur Women Krishnasaar Users Group
5	Gulariya Municipality-3, Nawa Durga Tole	Nawa Durga Krishnasaar Users Group	121	77	44	16	16	Nawa Durga Women Krishnasaar Users Group
6	Gulariya Municipality-3, Him Shikhar Tole	Him Shikhar Krishnasaar Users Group	321	179	142	59	59	Him Shikhar Women Krishnasaar Users Group
7	Gulariya Municipality-3, Shanti Tole	Shanti Krishnasaar Users Group	168	94	74	29	26	Shanti Women Krishnasaar Users Group

S.N	Address of Users Group	Name of Users Group Total Population	Total Population	Male Population	Female Population	HH Numbers/ Male Users Numbers	HH Numbers/ Female Users Numbers	Female Users Group Name
8	Gulariya Municipality-2, Khairhanjhala	Khairhanjhala Krishnasaar Users Group	452	230	222	91	91	Khairhanjhala Women Krishnasaar Users Group
9	Gulariya Municipality-1,2 Sangam Tole	Sangam Krishnasaar Users Group	244	122	122	46	44	Sangam Women Krishnasaar Users Group
10	Gulariya Municipality-1,2 Shiva Shakti Tole	Shiva Shakti Krishnasaar Users Group	200	104	96	37	37	Shiva Shakti Women Krishnasaar Users Group
			2168	**1156**	**1012**	**411**	**400**	
1	Gulariya Municipality-2, Krishnasaar Gha Tole	Krishnasaar Gha Krishnasaar Users Group	269	127	142	51	51	Krishnasaar Gha Women Krishnasaar Users Group
2	Gulariya Municipality-2, Babai Krishnasaar Tole	Babai Krishnasaar Users Group	77	41	36	14	12	Babai Women Krishnasaar Users Group
3	Gulariya Municipality-4, Sano Bechepur Shanti Tole	Sano Bechepur Shanti Tole Krishnasaar Users Group	227	110	117	39	38	Sano Bechepur Shanti Tole Women Krishnasaar Users Group
4	Gulariya Municipality-4, Muktipur	Muktipur Krishnasaar Users Group	72	42	30	16	15	Muktipur Women Krishnasaar Users Group
5	Gulariya Municipality-2, Milan Tole	Milan KhaKrishnasaar Users Group	120	59	61	27	27	Milan Kha Women Krishnasaar Users Group
6	Gulariya Municipality-4, Shivalaya Tole	Shivalaya Krishnasaar Users Group	205	104	101	34	33	Shivalaya Women Krishnasaar Users Group
7	Gulariya Municipality-4, Bechepur	Shree Krishna Pranami Krishnasaar Users Group	425	203	222	76	73	Shree Krishna Pranami Women Krishnasaar Users Group
8	Gulariya Municipality-4, Tulsipur	Uday Tulsipur Krishnasaar Users Group	254	134	120	49	46	Uday Tulsipur Women Krishnasaar Users Group
9	Gulariya Municipality-2, Krishnasaar Kha Tole	Krishnasaar Kha Krishnasaar Users Group	86	45	41	21	20	Krishnasaar Kha Women Krishnasaar Users Group
10	Gulariya Municipality-2, Krishnasaar Pidit Tole	Krishnasaar Pidit Krishnasaar Users Group	147	77	70	32	32	Krishnasaar Pidit WomenKrishnasaar Users Group
11	Gulariya Municipality-2, Krishnasaar Ka Tole	Krishnasaar Ka Krishnasaar Users Group	146	77	69	28	27	Krishnasaar Ka Women Krishnasaar Users Group
			2028	**1019**	**1009**	**387**	**374**	

S.N	Address of Users Group	Name of Users Group Total Population	Total Population	Male Population	Female Population	HH Numbers/ Male Users Numbers	HH Numbers/ Female Users Numbers	Female Users Group Name
1	Gulariya Municipality-3, Manakamana Tole	Manakamana Krishnasaar Users Group	253	133	120	48	47	Manakamana Women Krishnasaar Users Group
2	Gulariya Municipality-3, Udaypur Ka Tole	Udaypur Ka Krishnasaar Users Group	84	40	44	18	18	Udaypur Ka Women Krishnasaar Users Group
3	Gulariya Municipality-3, Chetana Tole	Chetana Krishnasaar Users Group	233	117	106	50	48	Chetana Women Krishnasaar Users Group
4	Gulariya Municipality-3, Udaypur Tole	Udaypur Krishnasaar Users Group	126	67	59	22	22	Udaypur Women Krishnasaar Users Group
5	Gulariya Municipality-3, Manikapur	Manikapur Krishnasaar Users Group	190	90	100	32	29	Manikapur Women Krishnasaar Users Group
6	Gulariya Municipality-3, Shankar Tole	Shankar Krishnasaar Users Group	276	144	132	54	53	Shankar Women Krishnasaar Users Group
7	Gulariya Municipality-3, Radha Krishna Tole	Radha Krishna Krishnasaar Users Group	114	59	55	19	18	Radha Krishna Women Krishnasaar Users Group
8	Gulariya Municipality-3, Hariyali Tole	Hariyali Krishnasaar Users Group	436	235	201	97	93	Hariyali Women Krishnasaar Users Group
9	Gulariya Municipality-4, Turuntapur	Sana Kishan Krishnasaar Users Group	247	130	117	41	41	Sana Kishan Women Krishnasaar Users Group
10	Gulariya Municipality-3, Durga Tole, Bhariya	Durga Krishnasaar Users Group	208	104	104	45	40	Durga Women Krishnasaar Users Group
11	Gulariya Municipality-3, Shiva Mandir	Shiva Mandir Krishnasaar Users Group	178	89	89	37	38	Shiva Mandir Women Krishnasaar Users Group
12	Gulariya Municipality-3, Anandanagar	Anandanagar Krishnasaar Users Group	152	78	74	30	28	Anandanagar Women Krishnasaar Users Group
			2497	**1286**	**1201**	**493**	**475**	

ANNEX 7: KrCA FIVE YEAR MANAGEMENT PLAN WITH BUDGETGAZETTE

S.N.	Activities	Unit	Quant.	NRs.	Year I	Year II	Year III	Year IV	Year V	Total Amount
1	**KrCA Protection**									
1.1	Construction of office building	No.	1	7500000	7500000					7500000
1.2	Construction of post at Panditpur	No.	1	3500000			3850000			3850000
1.3	Construct staff quarter at Khairapur	No.	1	650000		682500				682500
1.4	Construction of KrCA entrance gate	No.	1	1000000		1050000				1050000
1.5	Repair and maintenance of office building in HQ, post and staff quarter	No.	5	250000	250000	262500	275000	287500	300000	1375000
1.6	Electrification at offices and post	No.	3	150000	90000	94500	99000	103500	108000	495000
1.7	Construction of fire line	Km.	5	250000	250000	262500	275000	287500	300000	1375000
1.8	Gravelling of fire line	Km.	2	1000000				1150000	1200000	2350000
1.9	Maintenance and repair of fire line	Km.	15	25000	75000	78750	82500	86250	90000	412500
1.10	Install CC cameras in the forest and grassland connectivity and at strategic location to monitor predator	No.	5	35000		87500	87500			175000
1.11	Maintenance of CC cameras	No.	5	5000	5000	5250	5500	5750	6000	27500
1.12	Habitat reclamation after relocating encroachers by cleaning the debris	Ha.	100	30000	1500000	1575000				3075000
1.13	Demarcate and fence the core area	Km.	5	1000000	2500000	2625000				5125000
1.14	Maintenance and repair of fence	Km.	10	200000	400000	420000	440000	460000	480000	2200000
1.15	Promote bio fence by planting bamboo, babul, asuro	Km.	10	50000	50000	52500	55000	57500	60000	275000
1.16	Provide necessary logistic support to staffs for patrolling,	No.	25	125000			3125000			3125000
1.17	Procure 5 night vision binoculars for monitoring during nights	No.	20	35000	140000	147000	154000	161000		602000
1.18	Procure 30 bicycles for posts	No.	30	7500	45000	45000	45000	45000	45000	225000
1.19	Procure 3 motor bikes for posts	No.	3	250000	250000	262500	275000			787500
1.20	Procure 1 four wheel vehicle for day to day operation and management	No.	2	5500000	5500000					5500000
1.21	Maintenance and repair of vehicle	Years	5	200000	200000	210000	220000	230000	240000	1100000
1.22	Fuel for vehicle	Litres	1200	100	120000	126000	132000	138000	144000	660000
	Sub Total				**18875000**	**7986500**	**9120500**	**3012000**	**2973000**	**41967000**
2	**Habitat Management**									
2.1	Procure tractor and equipment for grassland management	No.	1	3500000	3500000					3500000
2.2	Grassland management by hiring tractor (before tractor is procured)	Ha.	750	6000	900000	945000	990000	1035000	1080000	4950000
2.3	Establish permanent plots to assess the condition of palatable grasses for blackbuck	Times	1	500000	500000					500000
2.4	Cultivate kimbu or crop as an alternate food for blackbuck	Ha.	250	15000	750000	787500	825000	862500	900000	4125000
2.5	Control invasive species by uprooting	Ha.	500	25000	2500000	2625000	2750000	2875000	3000000	13750000
2.6	Removal of *ipomea* in the wetlands or from old drain made by babai river	Ha.	90	85000	1530000	1606500	1683000	1759500	1836000	8415000
2.7	Plantation of Bird favoured bar, pipal, swami on the periphery of babai nala	Ha.	0.5	100000	25000			28750		53750
2.8	Construct water holes	No.	5	250000	625000	656250				1281250
2.9	Maintenance and repair of wetlands and water holes	No.	15	50000	75000	78750	82500	86250	90000	412500
2.10	Establish solar water pump to irrigate grassland in hot summer	No.	3	600000	600000	630000			720000	1950000
2.11	Underground pipe fitting for irrigation	Meter	4000	250	500000			550000		1050000

S.N.	Activities	Unit	Quant.	NRs.	Year I	Year II	Year III	Year IV	Year V	Total Amount
2.12	Maintenance and repair of pump used for boring	No.	9	10000	15000	15750	16500	17250	18000	82500
2.13	Construct additional raised mounds	No.	10	30000	30000	31500	33000	34500	36000	165000
2.14	Improvement of raise mounds	No.	5	500000	500000	525000	550000	575000	600000	2750000
2.15	Support operation of Nursery	Times	5	150000	75000	78750	82500	86250	90000	412500
2.16	Create grazing land in public land outside of core area to reduce grazing pressure in the core area,	No.	2	300000		315000		345000		660000
2.17	Create and restore wetlands outside of core area to provide water for livestock	No.	5	250000		262500	275000	287500		825000
2.18	Undertake river training activities in Babai river to control recurring flood which inundates KrCA									0
	Sub Total				**12125000**	**8557500**	**7287500**	**8542500**	**8370000**	**44882500**
3	**Species Conservation**									
3.1	Update Flora and Fauna of KrCA	Times	3	300000	300000		330000		360000	990000
3.2	Relief distribution to people affected by human wildlife conflict	Years	5	500000	500000	525000	550000	575000	600000	2750000
3.3	Construct well equipped rescue centre for injured blackbuck	Times	2	500000	500000	525000				1025000
3.4	Control domestic dog entering in core area of KrCA	No.	5	50000	50000	52500	55000	57500	60000	275000
3.5	Kanji house construction at two additional posts	No.	2	350000	350000		385000		420000	1155000
3.6	Kanji house maintenance	No.	3	100000		105000			120000	225000
3.7	Treatment and food for injured blackbuck	No.	5	50000	50000	52500	55000	57500	60000	275000
3.8	Translocate blackbuck in similar habitat of other PAs	Times	1	1000000					1200000	1200000
3.9	Exchange of blackbuck to improve the breed	Times	1	1500000				1725000		1725000
3.10	Livestock management training	Times	3	150000	150000		172500		180000	502500
3.11	Vaccinate local livestock in consultation with DLSO	Times	5	300000	315000	330000	362250	362250	378000	1747500
3.12	Conduct programme in coordination with DLSO to encourage stall-feeding and replacing unproductive livestock.	Years	5	300000	315000	330000	362250	362250	378000	1747500
3.13	Celebrate world Biodiversity Day on May 22	Years	5	250000	262500	275000	301875	301875	315000	1456250
3.14	Purchase of binoculars	No.	5	30000	30000	31500	33000	34500	36000	165000
3.15	Procure high resolution digital camera	No.	2	50000				55000	57500	112500
3.16	Purchase of G.P.S	No.	5	30000	30000	31500	33000	34500	36000	165000
	Sub Total				**2852500**	**2258000**	**2639875**	**3565375**	**4200500**	**15516250**
4	**Fire Management**									
4.1	Prepare and implement fire-fighting management plan	Times	1	300000		300000				300000
4.2	Identify fire prone areas by using mapping based on satellite imagery analysis or using the web-based fire mapper	Times	1	500000			550000			550000
4.3	Conduct training to staff and local people regarding firefighting techniques	Times	3	250000	250000		275000		300000	825000
4.4	Carry out control burning activities in fire prone areas before the onset of fire season	Years	5	300000	300000	315000	330000	345000	360000	1650000
4.5	Mobilize fire-fighting team with equipment (seasonal involving CA staff and locals) in order to stop spreading of fire in grasslands	Years	5	200000	200000	210000	220000	230000	240000	1100000
4.6	Provide fire-fighting equipment to post and CFUGs	Times	1	1250000				1437500		1437500
4.7	Construct 4 dual purpose ponds that provides water for wildlife including birds and for extinguishing fire	No.	4	350000	350000	367500	385000	402500		1505000

S.N.	Activities	Unit	Quant.	NRs.	Year I	Year II	Year III	Year IV	Year V	Total Amount
4.8	Construct fire hydrant supported by solar pump nearby ponds	No.	4	750000	750000	787500	825000	862500		3225000
4.9	Raise awareness on fire prevention and forest fire control	Years	5	175000	175000	183750	192500	201250		752500
4.10	Establish fire occurrence reporting and statistical databases	Times	3	150000	150000		165000		180000	495000
	Sub Total				**2175000**	**2163750**	**2942500**	**3478750**	**1080000**	**11840000**
5	**Wildlife Health Management**									
5.1	Establish wildlife rescue centre in HQ for emergency treatment	No.	1	350000	350000					350000
5.2	Treat injured blackbuck at rescue centre with the help of BNP/DLSO	Times	5	25000	25000	26250	27500	28750	30000	137500
5.3	Undertake yearly vaccination to local livestock in coordination with conservation partners and DLSO	Times	5	275000	275000	288750	302500	316250	330000	1512500
5.4	Support to establish a community based veterinary center with materials required in medical emergencies	No.	1	500000		500000				500000
5.5	Provide training to frontline staff to monitor, record and report disease or poor health condition of blackbuck	No.	5	250000	250000	262500	275000	287500	300000	1375000
5.6	Carry out postmortem of dead wild animals with the support of BNP or district veterinary office	Times	5	50000	50000	52500	55000	57500	60000	275000
5.7	Assess cases of mortalities of blackbuck to document emergence and spread of disease	Years	5	150000	150000	157500	165000	172500	180000	825000
5.8	Monitor water quality of wetlands and water holes in regular interval	Years	5	125000	125000	131250	137500	143750	150000	687500
	Sub Total				**1225000**	**1418750**	**962500**	**1006250**	**1050000**	**5662500**
6	**Encroachment Management**									
6.1	Keep updated data on registered land, illegal settlers and encroachers in the *ailani* land	Times	3	325000	325000	341250	357500			1023750
6.2	Form committee to address the issues of registered land, illegal settlers as unregistered land and encroachers	No.	1	50000	50000					50000
6.3	Organize all party meeting to resolve the resettlement issues	Years	3	50000	50000	52500	55000			157500
6.4	Work with committee formed by MoFSC and prescribe possible solution.	Years	3	100000	100000	105000	110000			315000
6.5	Issue notice to evacuate the encroached area	Times	3	125000	125000	131250	137500			393750
6.6	Provide compensation for the registered land	HH	142	50000	7100000					7100000
6.7	Support to improve the livelihood of landless, flood victim people who have encroached the park area for various reasons and evacuate them in win-win situation	HH	100	30000		1000000	1100000	1150000		3250000
	Sub Total				**7750000**	**1630000**	**1760000**	**1150000**	**0**	**12290000**
7	**Study and Research**									
7.1	Prepare zonation map of KrCA with proper delineation of facility zone, utility zone core zone and community development zone	Times	1	500000		500000				500000
7.2	Assessment of permanent plot	Years	5	300000	300000	315000	330000	345000	360000	1650000
7.3	Study population dynamics, animal health and diseases	Times	3	300000	300000		330000		360000	990000
7.4	Study about carrying capacity of blackbuck in KrCA	Times	1	300000			330000			330000
7.5	Study predator of blackbuck in KrCA and its impact on blackbuck conservation,	Times	1	300000		300000				300000
7.6	Undertake need of livestock grazing for grassland management to favor short grass,	Times	1	500000			550000			550000
7.7	Study of possible disease that can be transmitted from domestic animal to blackbuck	Times	1	200000				230000		230000
7.8	Prepare list of invasive species and prescribe ways to control them	Times	1	500000	500000					500000

S.N.	Activities	Unit	Quant.	NRs.	Year I	Year II	Year III	Year IV	Year V	Total Amount
7.9	Carry out study to assess impact of invasive species to grassland habitat	Times	1	400000	400000					400000
7.10	Conduct study to treat and control invasive species	Times	2	300000		300000			360000	660000
7.11	Study to use invasive species to produce tourist product in order to convert weeds into wealth	Times	2	1000000	1000000	1050000				2050000
7.12	Study whether genetic loss has been happening in blackbuck	Times	1	300000			330000			330000
7.13	Study of effect on blackbuck's health while consuming arsenic containing boring water	Times	1	500000		525000				525000
7.14	Study on climate change impact on blackbuck habitat with a specific focus on grasslands and invasive species	Times	1	300000		315000				315000
7.15	Assessment of translocated population and potential areas for further translocation	Times	2	400000			400000		480000	880000
7.16	Study of human wildlife conflict from problem animals	Times	1	500000				575000		575000
7.17	Study the impact of tourism in KrCA	Times	1	300000				230000		230000
7.18	The relationship between the intensity of anthropogenic activities and health of viable blackbuck populations	Times	1	50000					60000	60000
7.19	Undertake management effectiveness of KrCA	Times	1	500000					600000	600000
7.20	Evaluation of five year management plan	Times	1	500000				500000		500000
7.21	Preparation of five year management plan	Times	1	700000					700000	700000
7.22	Conduct IEE of management plan		1	300000					300000	300000
	Training									
7.23	Orientation training to Game Scouts on legal issues	Times	2	150000			165000	172500		337500
7.24	Wildlife management/handling techniques	Times	2	200000		210000		230000		440000
7.25	Counting of blackbuck on regular basis	Times	2	150000			165000		180000	345000
7.26	Basic training on field equipment like GPS	Times	3	250000	250000		275000		300000	825000
7.27	Orientation training on social mobilization	Times	2	300000		315000		345000		660000
7.28	Basic training on vegetation quantification for recording data in monitoring plots	Times	2	250000			275000		300000	575000
7.29	Wildlife health condition assessment	Times	3	250000	250000		275000		300000	825000
7.30	Software applicable for wildlife management specially database and GIS	Times	2	300000		315000		345000		660000
7.31	Certificate course in wildlife management	Times	5							0
7.32	Training of Trainers (general and specialized)	Times	2	400000			440000		480000	920000
7.33	Training on nature interpretation and display management	Times	3	250000	250000		275000		300000	825000
7.34	Training on participatory planning and monitoring	Times	2	200000		210000		230000		440000
7.35	Personnel management and legal procedure	Times	2	400000		420000		460000		880000
7.36	Training on organization development and management	Times	2	400000			440000		480000	920000
7.37	Diploma course in wildlife management	Times	5							0
7.38	Training on conflict management	Times	3	200000	200000		220000		240000	660000
	Institutional Strengthening									
7.40	Annual progress report publication	No.	5	150000	150000	157500	165000	172500	180000	825000
7.41	Website development	No.	1	350000	350000					350000
7.42	Website hosting	Year	5	20000	350000	367500	385000	402500	420000	1925000
7.43	Preparation of KrCA management regulation	Times	1	600000		630000				630000

S.N.	Activities	Unit	Quant.	NRs.	Year I	Year II	Year III	Year IV	Year V	Total Amount
	Sub Total				**4300000**	**5930000**	**5350000**	**4237500**	**6400000**	**26217500**
8	**Tourism Development**									
8.1	Construction of VIC with souvenir shop, restaurant, entrance ticket counter, documentary showing hall, watch tower and differently able friendly public toilet	No.	1	11000000		5500000	6050000			11550000
8.2	Watch tower construction	No.	3	1000000	1050000		1155000		1200000	3405000
8.3	Maintenance and repair of watch towers	No.	5	150000	150000	157500	165000	172500	180000	825000
8.4	Trail development for visitors to observe blackbuck	Km.	5	125000	125000	131250	137500	143750	150000	687500
8.5	Undertake clean-up campaign in and around CA and Babai drainage	Times	5	150000	150000	157500	165000	172500	180000	825000
8.6	Support cultural conservation committee to establish cultural museum	Times	1	500000		500000				500000
8.7	Provide nature guide training	Times	3	300000	300000		345000		360000	1005000
8.8	Conduct Home stay and housekeeping training	Times	3	300000		300000	330000	345000		975000
8.9	Carry out Cook training	Times	3	300000	300000		330000		360000	990000
8.10	Signboard development and erection	Times	2	250000		250000		287500		537500
8.11	Produce brochure of KrCA	No.	2500	40	20000	21000	22050	23100	24150	110300
8.12	Provide fellowship to journalist to visit KrCA and publish article	Times	5	75000	75000	78750	82500	86250	90000	412500
8.13	Exchange visit of tourism operator of KrCA and BNP	Times	3	500000	500000		550000		600000	1650000
8.14	Establish display and hoarding board of KrCA in Ranjha airport	Times	2	25000	25000	26250				51250
8.15	Erect hoarding board of KrCA at Nepalgunj	No.	5	15000	15000	15000	15750	16500	17250	79500
8.16	Publish news and article in newspaper	Times	5	100000	100000	105000	110000	115000		430000
8.17	Production of video documentary	Times	1	400000					480000	480000
	Sub Total				**2810000**	**7242250**	**9457800**	**1362100**	**3641400**	**24513550**
9	**Climate Change Adaptation**									
9.1	Prepare Local Adaptation Plan of Action for municipalities and rural municipalities of CA	No.	2	300000	600000					600000
9.2	Undertake vulnerability assessment with regards to climate change	Times	1	500000		525000				525000
9.4	Study impacts of changes in precipitation and temperatures in KrCA	Times	2	250000			275000	287500		562500
9.5	Pilot early warning system of flash flood in Babai river	No.	1	750000					900000	900000
9.6	Carry out preparedness for flood rescue and fire control	No.	2	300000		315000		345000		660000
9.8	Monitor the impacts of climate change in indicator species	Times	5	150000	150000	157500	165000	172500	189000	834000
9.10	Implement prioritized climate change adaptation measures	Times	5	500000	500000	525000	550000	575000	630000	2780000
9.12	Plantation in private and public land to maintain the balance between fuel wood demand and supply	Ha	25	25000	150000	157500	165000	172500	189000	834000
9.13	Install and scale up improved cook stove for less fuel wood consumption	No.	500	1500	150000	157500	165000	172500	189000	834000
9.14	Promote Biogas in the household of KrCA	No.	250	15000	750000	787500	825000	862500	945000	4170000
9.15	Create awareness and impart orientations towards local communities on climate change	Years	5	250000	250000	262500	275000	287500	315000	1390000
9.16	Facilitate market linkages and voluntary carbon financing	Times	1	400000					480000	480000
	Sub Total				**2550000**	**2887500**	**2420000**	**2875000**	**3837000**	**14569500**

S.N.	Activities	Unit	Quant.	NRs.	Year I	Year II	Year III	Year IV	Year V	Total Amount
10	**Solid Waste Management**									
10.1	Manage garbage with special focus on reducing production, recycling, and destruction by prohibiting the use of polluting items such as plastic bags	Times	2	400000		420000		460000		880000
10.2	Provide water supply, toilet, drainage, collection and recycling centre to schools, public buildings, and household with the support from conservation partners	Times	5	500000	500000	525000	577500	664125	796950	3063575
10.3	Support Eco-Clubs to organize clean-up campaign regularly	Year	5	300000	300000	315000	346500	398475	478170	1838145
10.4	Monitor the homestay and lodges to make them follow the sanitation guideline	Year	5	150000	150000	157500	173250	199238	239085	919073
	Sub Total				**950000**	**1417500**	**1097250**	**1721838**	**1514205**	**6700793**
11	**Community Development**									
11.1	Support institutional strengthening of conservation communities	Year	5	400000	400000	420000	441000	463050	486202.5	2210252.5
11.2	Support institutional strengthening of conservation communities	Year	5	400000	400000	420000	441000	463050	486202.5	2210252.5
11.3	Support KrCA communities to prepare five-year plan	Times	1	500000					500000	500000
11.4	Construct alternate route to benefit community of Panditpur which goes outside of core area		5	500000	500000	525000	551250	578812.5	607753.13	2762815.625
11.5	Support hume pipe in the road to discharge stagnant water		25	40000	200000	210000	220000	230000	240000	1100000
11.6	Provide support to biogas installation		250	500000	500000	525000	550000	575000	600000	2750000
11.7	Promote crops that are not preferred by blackbuck	Km.	2	300000		330000		45000		375000
11.8	Develop livelihood improvement strategy	No.	1	500000	500000					500000
11.9	Produce bio-briquette using invasive species	No.	3	300000	300000			345000	315000	960000
11.10	Provide firefighting equipment of CFUG	Times	1	300000		330000				330000
11.11	Learning Visit of KrCA staff in other PAs having blackbuck	No.	1	500000				575000		575000
11.12	Educational tour for conservation committee members	Times	3	300000	315000		330000		360000	1005000
11.13	Celebration of conservation days	No.	20	150000	150000	157500	165000	187500	217500	877500
11.14	Organize World Wildlife Week	Times	5	100000	100000	105000	110000	115000	120000	550000
11.15	Produce IEC material	Times	3	300000	300000		330000		60000	690000
	Sub Total	**Times**			**3665000**	**3022500**	**3138250**	**3577412.5**	**3992658.125**	**17395820.63**
12	**Office Management**	**Times**								
12.1	Purchase of computer		3	80000	80000	84000	88000			252000
12.2	Purchase of multimedia projector		1	90000		94500				94500
12.3	Office material management		5	50000	50000	52500	55000	57500	60000	275000
12.4	Stationery	No.	5	50000	50000	52500	55000	57500	60000	275000
12.5	Procure furniture	No.	5	50000	50000	52500	55000	57500	60000	275000
12.6	Electricity, telephone, Internet	No.	5	100000	100000	105000	110000	115000	120000	550000
	Sub Total	**No.**			**330000**	**441000**	**363000**	**287500**	**300000**	**1721500**
	Total	**No.**			**59607500**	**44955250**	**46539175**	**34816225**	**37358763**	**223276913**

ANNEX 8: PARTICIPANTS IN THE MEETING

Participants for the preparation of Five Years Management Plan of KrCA Management Council Date: 2073/11/08

SN	Name	Designation	Organization
1	Krishna Prasad Khanal	Chair Person	KrCAMC
2	Ram Sumiran Yadav	Member	KrCAMC
3	Tanka Prasad Adhikari	Member	KrCAMC
4	Prem Kumari Rijal	Member	KrCAMC
5	Bidya Prasad Yadav	Member	KrCAMC
6	Bishnu Kumari Sharma Bhushal	Member	KrCAMC
7	Mulchandra Yadav	Advisory Member	KrCAMC
8	Purushottam Sharma	Conservation Officer/Member Secretary	KrCA/KrCAMC
9	Bishal Sintan	Ranger	KrCA
10	Manraj Lama Moktan	Ranger	KrCA
11	Padam Bdr. Shahi	Accountant	KrCA
12	Saurav Shrestha	Consultant	Sustainable Development Initiative Center

Participants of District Level Stakeholder interaction on draft Five Year Management Plan Date: 2073/11/09

SN	Name	Designation	Organization
1	Pitambar Sharma		District Development Committee, Bardiya
2	Ghanshyam Adhikari		Gulariya Municipality Bardiya
3	Ram Avatar Harijan		District Agrigulture Development Office
4	Krishna Prasad Bashyal	Chair Person	ICDC Bardiya
5	Badri Binod Dahal	Asst. Conservation Officer	Bardiya National Park Office
6	Saraswoti Sapkota	Asst. Planning Officer	DNPWC
7	Tanka Prasad Adhikari	Chair Person	Babai Krishnasaar User Committee
8	Mulchandra Yadav	Member	Radhakrishna Krishnasaar User Committee
9	Dronaraj Sharma	Asst. Forest Officer	District Forest Office Bardiya
10	Gira Kumari Basnet	Woman Development Officer	Woman Development Office Bardiya
11	Nilkantha Regmi	Deputy District Education Officer	District Education Office Bardiya
12	Yadav Acharya	Vice President	Nepal Journalist Association Bardiya
13	Teknath Acharya	Senior Veterinary Doctor	District Veterinary Office Bardiya
14	Sanjay Mijar	Veterinary Doctor	District Veterinary Office Bardiya
15	Purushottam Sharma	Conservation Officer	Krishnasaar Conservation Area Office
16	Saurav Shrestha	Consultant	Sustainable Development Initiative Center

Participants in the Central Level Interaction on draft Five Year Management Plan at DNPWC Date: 2074/01/25

SN	Name	Designation	Organization
1	Man Bdr. Khadka	Director General	DNPWC
2	Sher Singh Thagunna	Deputy Director General	DNPWC
3	Shyam Bajimaya	Former Director General	DNPWC
4	Narendraman Babu Pradhan	CEO	Bird Conservation Nepal
5	Amir Maharjan	Planning Officer	DNPWC
6	Narayan Rupakheti	Management Officer	DNPWC
7	Laxman Prasad Poudyal	Ecologist	DNPWC

SN	Name	Designation	Organization
8	Bishnu Prasad Shrestha	Conservation Education Officer	DNPWC
9	Sushma Rana	Investigation Officer	DNPWC
10	Bhawaraj Joshi	Under Secretary (Finance)	DNPWC
11	Bhogendra Rayamajhi	Program Officer	ZSL Nepal
12	Manishraj Pande	Senior Conservation Officer	NTNC Central Office
13	Pramila Neupane	Ranger	DNPWC
14	Anjani Kumar Ghimire	Legal Officer	DNPWC
15	Rishi Ranabhat	Asst. Ecologist	DNPWC
16	Saraswoti Sapkota	Asst. Planning Officer	DNPWC
17	Khemraj Prasai	Computer Officer	DNPWC
18	Rishiram Dhakal	Conservation Officer	Annapurna Conservation Area Office
19	Kedarnath Katel	Asst. Monitoring and Evolution Officer	DNPWC
20	Bhojraj Pantha	Asst. Conservation Education Officer	DNPWC
21	Ganesh Pant	Chief Conservation Officer	Sagarmatha National Park Office
22	Bhupendra Prasad Yadav	Asst. Ecologist	DNPWC
23	Bishnu Prasad Thapaliya	Asst. Management Officer	DNPWC
24	Raj Kumar Subedi	Na.Su.	DNPWC
25	Saurav Shrestha	Consultant	Sustainable Development Initiative Center
26	Purushottam Sharma	Conservation Officer	Krishnasaar Conservaton Area Office
27	Santosh Kumar Bhagat	Ranger	DNPWC
28	Rabindra Karki	Computer Officer	DNPWC
29	Sunom Shrestha	Program Officer	Sustainable Development Initiative Center
30	Mimesh Ghimire	Chair Person	EDRC

Interaction with KrCA Staff Date: 2073/09/19

SN	Name	Designation	Organization
1	Purushottam Sharma	Conservation Officer	KrCA
2	Padam Bdr. Shahi	Accountant	KrCA
3	Subodh Jha	Game Scout	KrCA
4	Dum Chand	Game Scout	KrCA
5	Parshuram Tharu	Game Scout	KrCA
6	Hariram Yadav	Game Scout	KrCA
7	Abadharam Harijan	Game Scout	KrCA
8	Paikram Yadav	Game Scout	KrCA
9	Binod Kumar Yadav	Game Scout	KrCA
10	Lok Prasad Bhushal	Game Scout	KrCA
11	Rupesh Kumar Yadav	Game Scout	KrCA
12	Tikaram Paudel	Facilitator	Sustainable Development Initiative Center (SDIC)
13	Rajesh Kuchhabadhiya	Office Helper	KrCA
14	Saurav Shrestha	Conservation Specialist	SDIC
15	Shiv Kumar Chaudari	Game Scout	KrCA
16	Kumraj Oli	Driver	KrCA

ANNEX 9: MANAGEMENT PLAN PREPARATION TEAM

SN	Name	Designation	Organization
1	Purushottam Sharma	Conservation Officer/Team Leader	KrCA
2	Bishnu Pd. Thapaliya	Asst. Mgt. Officer/member	DNPWC
3	Sarswoti Sapkota	Asst. Planning Officer/member	DNPWC
4	Saurav Shrestha	Consultant/Management Plan Preparation Expert	SDIC
5	Bhola Nath Dhakal	GIS Expert	SDIC
6	Tika Ram Poudel	Consultant/Conservation Communities Expert	SDIC
7	Smrita Acharya	Support staff	SDIC
8	Sunam Shrestha	Support staff	SDIC

ANNEX10: REVIEWERS OF THE MANAGEMENT PLAN

SN	Name	Designation	Organization
1	Mr. Shyam Bajimaya	Expert Reviewer	Freelance Protected Area Management
2	Gopal Prakash Bhattarai	Deputy Director General	DNPWC
3	Sher Singh Thagunna	Deputy Director General	DNPWC
4	Ganesh Pant	Chief Conservation Officer	Sagarmatha National Park