

**Final Report
On
"Conservation effectiveness of Banke National Park"**



**SUBMITTED TO
Planning Section**

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Acronyms

AFO	: Assistant Forest Officer
BNP	: Bardia National Park
BaNP	: Banke National Park
BZ	: Buffer Zone
BZMC	: Buffer Zone Management Committee
BCFUGs	: Buffer-zone Community Forest User Groups
CA	: Conservation Area
CBAPU	: Community Based Anti-Poaching Unit
CBD	: Convention on Biological Diversity
CBOs	: Community Based Organization
CFUG	: Community Forest Users Group
DDC	: District Development Committee
DFO	: District Forest Office
DNPWC	: Department of National Parks and Wildlife Conservation
IDA	: International Development Agency
I/NGO	: International/Non-governmental Organization
IUCN	: International Union for Conservation of Nature and natural Resources, The World Conservation Union
GoN	: Government of Nepal
HR	: Hunting Reserve
MoFSC	: Ministry of Forests and Soil Conservation
NP	: National Parks
NTB	: Nepal Tourism Board
NTNC	: National Trust for Nature Conservation
PA	: Protected Area
PHQ	: Park Headquarter
TAL	: Terai Arc Landscape
UNEP	: United Nations Environment Program
WCCB	: Wildlife Crime Control Bureau
WCPA	: World Commission on Protected Areas
WLR	: Wildlife Reserve
WWF	: World Wildlife Fund
ZSL	: Zoological Society of London

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SUMMARY

Biodiversity is very important for the sustenance of the human life in the earth but due to various reasons it is continuously diminishing and compelling many floral and faunal species towards extinction. The world is taking protected area management system as a good option to conserve biological resources of the earth by reducing human impacts and backed with conservation supportive rules and regulations. Nepal has declared its 23.39 per cent of its land as protected area. Banke National Park was established in 2010 as the 10th national park of Nepal to fulfill the international commitment of Nepal to double the tiger population of Nepal by 2022. Many protected areas are failing to attain the conservation objectives and in some cases even losing the values for which they were established. So the conservation professionals and the scientific communities are very concerned about the effectiveness of protected area management. As a state party of Convention on Biological Diversity (CBD) it is obligatory for Nepal to evaluate the conservation effectiveness of protected areas.

The framework developed by International Union for Conservation of Nature, World Commission on Protected Areas (IUCN WCPA) was used to assess the effectiveness of the conservation activities in Banke national Park. Total 30 criteria under six stages of the framework were used to assess the effectiveness. In addition the formal and informal interactions with park officials, community leaders, and conservation partners were also conducted. The literatures and office records were also used as sources of additional information. The specific sites inside park and buffer zone were also visited.

The overall effectiveness of protected area management was good by obtaining the mark score 210 out of 300 securing 70%. The process and planning stages secured highest marks but the context, outputs and outcomes aspects secured less marks. Information collection, documentation and sharing mechanisms need improvements accompanied with new and advance data management technologies. Tourism development sector was also in poor condition. The infrastructures required for tourism development were lacking. Forest fire, invasive species and human wildlife conflicts were few existing threats and challenges need to be properly addressed. Besides, the continuous efforts on conservation and infrastructure development with public participation and the supports from conservation partners, there are gradual improvements in park status. The populations of tiger, elephants and prey base species are increasing.

Broadly the planned socio-economic and institutional actions are required to address the conservation threats and challenges such as awareness raising for the importance of biodiversity and the services it provides, developmental activities inside the park and in buffer zone, infrastructure development for tourism enhancement with close collaboration with local institutions as tourism can contribute a lot in local and national economies. Moreover the management plan of BaNP is urgently needed to streamline the course of conservation activities. The arrangement of proposed human resources with adequate trainings and facilities will help to implement the conservation plans and activities more effectively and efficiently.

1. Introduction

1.1 Biodiversity Conservation in Nepal

Nepal covers only 0.1 per cent of the Earth's land surface but its unique geography and latitudinal and climatic variation make it a suitable home for wide ranges of floral and faunal diversity (GoN, 2014). Nepal harbors world's 3.2 per cent and 1.1 per cent of known flora and fauna respectively. In Nepal, 118 different types of ecosystems have been recognized including 75 types of vegetations, 35 types of forests, 3 agro-ecosystems, 2 wetland ecosystems, 5 types of rangeland ecosystems. In total 6973 species of flowering plants, 867 species of birds, 208 mammals, 123 reptiles, 117 amphibians and 230 fish species are found in Nepal (GoN, 2014).

Biodiversity has a very close link with the livelihoods of local communities. Many species are consumed by local people in the forms of food, fuel, fiber, dyes, oil, gum and medicines and most of the species have religious values too. So biodiversity conservation is a fundamental part of the local livelihoods and economic well-being as it is directly or indirectly related to all aspects of living including agricultural productivity, construction materials, health and nutrition, food security, water resources, cultural values and knowledge and gender equality issues. But the rapid destruction of diverse ecosystems and the followed consequences demand the improved management of biological resources urgently promoting the sustainable use of ecosystems.

Nepal became a signatory member of Convention on Biological Diversity in 1992 during the Earth Summit in Rio De Janeiro, Brazil (GoN, 2014). It guides to conserve forest ecosystems, wildlife habitats, species conservation and other genetic resources through the establishment of protected area system backing with required act and regulations. Nepal has declared 23.39 per cent of its land covers as protected area (DNPWC, 2016) with 12 national parks, 1 wildlife reserve, 1 hunting reserve, 6 conservation areas and 13 buffer zones. Declaring this large mass of land as protected area is the greatest effort of Nepal at protecting its unique ecosystems and biological resources. Nepal has been shifting its conservation paradigm from species focus conservation to now at landscape level conservation. As a commitment to conserve biodiversity at landscape level, Nepal Government established Banke National Park (BaNP) as 10th national park (NP) of Nepal on 12th July 2010 (www.dnpwc.gov.np).

1.2 Banke National Park and Buffer Zone

Banke National Park covers an area of 550 sq. Km. of unique and biodiversity rich South Western Terai region of Nepal. The surrounded 343 sq. Km. area was also declared as Buffer zone area (BZ) of the Park. It is located between 81°39'29" to 82°12'19" east longitude and 27°58'13" to 28°21'26" north latitude. This park was established to fulfill the international commitment of Nepal to double the tiger population of Nepal in 2022 through the conservation and management of Tiger habitat and biological corridor (Chapagain, 2014). The park is connected with other protected areas (PA) of Nepal (Bardia National Park) and India (Suhelwa

Wildlife Sanctuary) through biological corridors like Khata corridor, Kamdi corridor and other national and community forests (CF).

The park is totally located in Banke district but the buffer zone encompasses the parts of Banke, Dang, Salyan and Surkhet districts. It extends from Shivakhola in the east to Kohalpur Surkhet Highway in the West, Peak of the Chure range in the North and East West Highway in the south. A total of 4,861 households with 35,721 people are residing in buffer zone. The population dominated by indigenous Tharu community including other groups i.e. Brahmin, Chhetri, Magar, Tamang, Majhi and Gurung. Majority of the people about 90% are agriculture dependent and remaining 10% population do trade and labor (www.dnpwc.gov.np).

1.2.1 Biodiversity and habitat

The park is gifted with rich biodiversity including 8 types of natural ecosystems of terai and chure regions i.e. Sal forest, deciduous riverine forest, savannahs and grasslands, mixed hardwood forest, flood plains, Bhabar and foot hill of Chure range. BaNP is a part of Global 200 Eco-region i.e. Terai-Duar Savanna and Grassland. The area harbors 124 plant species, 34 mammals species, more than 300 bird species, 58 species of fishes, 24 species of reptiles and 9 species of amphibians (BaNP, 2016, dnpwc.gov.np). The park contains 90 per cent of natural forest composed of Sal (*Shorea robusta*), Karma (*Adina cordifolia*), Khair (*Acacia catechu*) and Sissoo (*Dalbergia sissoo*). Among many wild animals three mammals (Tiger-*Panthera tigris*, Striped Hyaena-*Hyaena hyaena*, Four-horned Antelope-*Tetracerus quadricornis*), four types of bird species (Giant Hornbill-*Buceros bicornis*, Black Stork-*Ciconia nigra*, Bengal Florican-*Houbaropsis bengalensis* and Lesser Florican-*Sypheotides indicus*) and two reptiles (Gharial Crocodile-*Gavialis gangeticus* and Python-*Python spp.*) are the protected animal under National Parks and Wildlife Conservation Act 1973.

The park is mainly comprised of Sal forest, mixed hardwood forest and grasslands which differ according to the altitudinal ranges. There are six types of forests inside park (Table 1). The park contains around 1 per cent of grassland which is also broadly categorized into two different types. a) Grassland with small size trees dominated with grass species like Siru-*Imperata cylindrica*, Kansh-*Saccharum spp.*, Dhaddi with small size trees of Khair, Asna-*Terminalia elliptica*, Botdhanyero-*Lageerstroemia parviflora*, Sissoo and Karma. b) Riverine grassland comprises of grass species like Dubo-*Cyanodon dactylon*, Banso-*Eragrostis unioides*, Karaunti-*Leersia hexandra*, Kansh etc.

Table 1: Forest types found in Banke National Park

S.N.	Type of cover	Main species
a.	From 153 m to 250 m	
1	Terai Sal forest	Sal
2	Terai riverine forest	Khair and Sissoo
3	Grassland	Siru, Dubo, Banso, Kansh, Khadai
b.	From 250 m to 600 m	

4	Mixed hardwood forest	Asna, Karma, Kadam, Kusum, Harro, Barro, Bhorla etc.
5	Hill Sal forest	Sal, Botdhangero etc.
6	Hill riverine forest	Khair, Sissoo etc.
	Grassland	Siru, Dubo, Banso etc.
c.	From 600 m to 1247 m	
1	Churia mixed hardwood forest	KhoteSalla, Asna, Sal, Botdhangero, Bhorla etc.

1.2.2 Climate

Three distinct seasons prevail in the park area i.e. winter, summer and monsoon. The weather remains dry from October to early April. The hot humid weather runs from April to June with the maximum temperature up to 45°C during May/June. Then the monsoon starts and remains till September.

1.3 Rational of Conservation effectiveness

Biodiversity is the total variety and variability among living organism and ecological complexes in which they occur. It is simply grouped in three levels: genetic, species and ecosystem (GoN, 2014). But due to infinite causes, the biodiversity of the world is diminishing continuously and if the trend goes on like this there is high risk of extinction of many floral and faunal species from earth.

Protected area management is becoming a best way of conserving biological resources and has been practicing all over the world and it is a critical component of human well-being (Rodriguez and Rosado, 2017). Since the establishment of Yellow Stone National Park in 1872, A total of 217,155 (202467 terrestrial and 14,688 marine) protected areas have been established in 244 countries in the forms of National Parks, Reserves, Conservation areas and Sanctuaries covering around 15% of the earth's land surface (UNEP-WCMC and IUCN, 2016). Still the number and the extent of protected areas are increasing. The growing network of the protected areas is gaining recognition for its contribution in safeguarding the natural and cultural resources and reducing the human impacts on biodiversity. Protected areas also provide many livelihood options to the local people through tourism development and other conservation related programs and activities.

The countries are establishing protected area systems as a core strategy to protect biodiversity and environment of the country (Leverington et al., 2010). The governments and communities are investing substantial amount of resources in protected areas and they have rights to know if their investments are effectively invested or not. The protected area professionals and people are concerned about the effectiveness of the management interventions to protect the values of the protected areas. Many protected areas are failing to achieve their objective and in some cases losing the values for which they were established (Hockings et al., 2006). This growing interest in the effectiveness of management of protected areas are represented as a big issue of discussion in different international forums and a great achievement is that the protected area management

effectiveness is now taken as a key element of a broader examination of progress towards the Convention on Biological Diversity (CBD) strategic plan and its constituent Aichi Targets- especially Target 11, which aims by 2020, at least 17 % of terrestrial and inland water, and 10 percent of coastal and importance for biodiversity and ecosystem services, area conserved through effectively and equitably managed, ecologically representative and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes (Hookings et al., 2015). Since then the state parties have been practicing the assessment of the effectiveness of the protected area as an integral part of their protected area management systems. As a party state of CBD and an essential component of management system, the Government of Nepal (GoN) has been regularly evaluating the effectiveness of the overall management system of its protected areas. Protected areas have their own kinds of challenges and threats, unless addressed, can fail the whole management scheme (Mathur et al., 2011). So the conservation success depends upon the regular assessment of the management effectiveness and adopting the results to improve the conservation strategies. Assessments help to bring out the real situation of the management system and provide guidelines to redesign the management plan for effective management by addressing the potential threats and challenges and utilizing the opportunities.

Banke National Park is the youngest national park of Nepal and implementing the management interventions with limited financial and technical resources to conserve contained unique biodiversity. It is the youngest national park with only 7 years of conservation history and could be early to do impact assessment. So as a tool "Conservation Effectiveness Assessment" was conducted to identify what is and what is not working well and provide feedbacks to the park authority to make necessary changes so that the management strategies will run effectively.

1.4 Management Effectiveness Assessment

The main aim of this assessment was to identify the existing and potential challenges and threats in Banke National Park management and identify the most essential factors for good management of the area and to recommend the ways to maximize the benefits that can be obtained from the area.

1.5 Objective

The main objective of this program was to assess the conservation effectiveness of Banke National Park management. The specific objectives were;

1. To understand the perception of stakeholders towards Conservation.
2. To assess the management activities and conservation threats of the park.
3. To identify more effective management interventions in the future.

2. Methodology

2.1 Study area

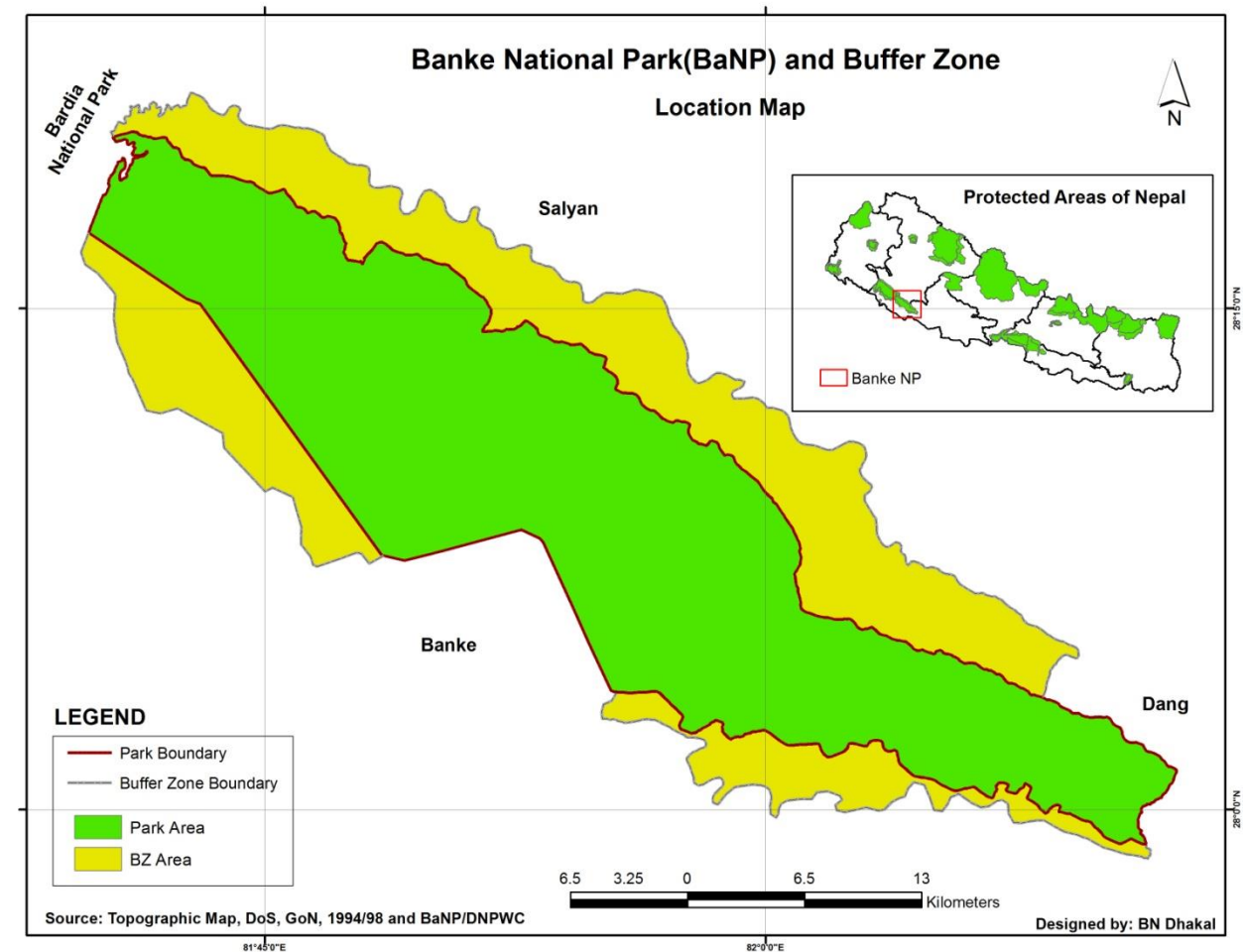


Figure 1: Banke National Park and Buffer Zone

2.2 Methods

Following methodology was adopted to evaluate the management effectiveness of the Banke National Park.

The WCPA framework for Assessing Management Effectiveness

Before 1996, there were several methodologies developed and practiced in different regions to assess the protected area management effectiveness. In 1996, the IUCN World Commission on Protected Areas (WCPA) started on a framework and guidelines for assessing the management effectiveness of protected areas and prepared a guideline known as IUCN WCPA framework, which has been using as the foundation for most of the protected area evaluation systems developed and applied around the world since then (Hockings et al., 2015). This framework provides guidance about what to assess and provides broad criteria for assessment, while

enabling different methodologies to be incorporated; so assessment can be undertaken at different scales and depths. The same framework was used with few improvements to assess Banke National Park.

The IUCN WCPA framework reflects the management as a cycle with six specific stages as shown in the Figure 1.



Figure 2: The WCPA Framework for Assessing Management Effectiveness
(Source: Hockings et al., 2006)

The questions were prepared and classified into the six stages of IUCN WCPA framework. The management effectiveness was evaluated by answers of protected area managers and other stakeholders to questionnaires adapted to the socio-economic and environmental characteristics of the park and buffer zone.

2.3 Assessment Criteria

The assessment methodology and the number of criteria differ according to available time and resources and other situations. To assess the effectiveness of Banke National Park management, the 30 criteria were developed and applied to assess the each six elements of IUCN WCPA framework.

3. Result and discussion

3.1 Context

3.1.1. Are the values of the BaNP well documented, assessed and monitored?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Values not systematically documented, assessed and monitored.	Poor		<ul style="list-style-type: none"> • Monthly report, quarterly report, wild animal census reports • Camera trapping for tiger monitoring • Bird count reports including winter and summer bird counts. • Prey base survey 	<ul style="list-style-type: none"> • Joint monitoring with TAL team and other higher officials from DNPWC, MoFSC.
Values generally identified but not systematically assessed and monitored.	Fair	√		
Most values systematically identified, assessed and monitored.	Good			
All values systematically identified, assessed and monitored.	Very good			

Here, action points to improve systematic documentation, assessment and monitoring, values should be suggested such as

- Regular monitoring and sound record keeping system so that the information will be readily available.
- Giving priority to research work and make available the up to date information to public.
- Publication of the data through articles, books and other hard forms as well as through official webpage.

3.1.2. Are the threats to BaNP values well documented and assessed?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Threats not systematically documented or assessed.	Poor		<ul style="list-style-type: none"> • Strategy and action plan 2015-2025 Terai Arc landscape • Anti-poaching reports • Monthly, quarterly, annual reports • Prosecution of wildlife criminals to the court. 	<ul style="list-style-type: none"> • Anti-poaching units with active participation of park army and other community based anti-poaching.
Threats generally identified but not systematically assessed.	Fair			
Most threats systematically identified and assessed.	Good	√		
All threats systematically identified and assessed.	Very good			

This assessment was based on number, nature and extent of threats.

3.1.3. Is the 'Core Area' of BaNP free from human and biotic interference?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
The "Core Area" has extensive human and biotic interference.	Poor		<ul style="list-style-type: none"> • People were arrested, punished according to NPWCA and regulations. • Presence of some invasive species like hyacinth, Banmara • Management interventions and submitted reports. 	<ul style="list-style-type: none"> • Security posts were established at strategic points with regular patrolling by the forces.
The "Core Area" has some human and biotic interference.	Fair			
The "Core Area" has little human and biotic interference.	Good	✓		
The "Core Area" has no human and biotic interference.	Very good			

This assessment was based on existence of human settlements/ villages inside the core area; livestock grazing, cultivation, encroachments etc, resource extraction/ livelihood dependence of local communities and should reflect the overall interference due to all the above factors.

3.1.4. Does the administrative framework adequately support the effective functioning of BaNP?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Less administrative support and inadequate	Poor		<ul style="list-style-type: none"> • Organizational structure of BaNP • Management Plan under preparation. 	<ul style="list-style-type: none"> • Deployed staff and security forces
Some level of administrative support but not sufficient	Fair			
Fair administrative support but insufficient in some sector	Good	✓		
Sufficient of administrative support	Very good			

3.2 Planning

3.2.1. Is the site properly identified and categorized (in terms of zoning) to achieve the objective?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Some Sites identified but no plan	Poor		<ul style="list-style-type: none"> • Clear boundary between core area and buffer zone area, with outside. 	
Some Sites identified and their action plan prepared	Fair			
Relevant sites identified, plan prepared, in some location zoning	Good	✓		

done				
Relevant sites identified, plan prepared and effectively implemented	Very good			

3.2.2. Status of Conservation Plans and other conservation activities (Does the site have comprehensive management plan?)

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
No CP in place.	Poor		<ul style="list-style-type: none"> • BaNP Management plan under preparation • Tiger Conservation Action Plan of Nepal exists • Terai Arc Landscape Strategy 2015-2025 operational. 	
CP is under preparation	Fair	√		
PAs has a relevant CP and other conservation activities	Good			
The CP is comprehensive and relevant to target objectives.	Very good			

3.2.3. Does the PA safeguards the threatened biodiversity values?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
It does not safeguard the threatened biodiversity values.	Poor		<ul style="list-style-type: none"> • Good habitat for Tiger and prey base. The number of Tiger is increasing. • Habitat management • Security system • It links other protected areas providing a good connection for big animals to travel from one place to another 	
It safeguards a few threatened biodiversity values.	Fair			
It safeguards a large number of threatened biodiversity values.	Good	√		
It safeguards all threatened biodiversity values.	Very good			

Which biodiversity values are not safeguarded (if any)?

- The protected animals like Stripped Hyaena and Four-horned Antelope were not given the priority as other mega animals like tiger and elephant were getting.

3.2.4. Are stakeholders given an opportunity to participate in planning process?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Little, if any opportunity for stakeholder participation in planning.	Poor		<ul style="list-style-type: none"> • Buffer Zone development planning • Minutes of the stakeholder meetings 	
Stakeholders participate in some planning.	Fair			

Stakeholders participate in most planning processes.	Good	√	<ul style="list-style-type: none"> • Agreements and MoUs between conservation partners and DNPWC and BaNP to conduct different conservation works. • Financial and technical supports provided by partner organizations. 	
Stakeholders routinely and systematically participate in all planning processes.	Very good			

3.2.5. Are habitat restoration programs systematically planned, relevant and monitored?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Habitat management program are entirely absent.	Poor		<ul style="list-style-type: none"> In 2008 signs of only two tigers were found In 2017, 13 tigers were found. Among those 2 tigers share common habitat with Bardia NP Regular conduction of grassland and wetlands management activities 	In 2008, the park was part of national forest under DoF management
Limited planning and monitoring program are in place for habitat management.	Fair			
Habitat management program are generally planned and monitored.	Good	√		
Habitat management program are thoroughly planned and monitored.	Very good			

3.2.6. Does the PA have an effective protection strategy?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
It has little or no protection strategy.	Poor		<ul style="list-style-type: none"> BaNP management plan under preparation SMART patrolling WCCB CBAPUs Army force Periodic reports and other documents Park and security force Periodic assessments under approval process Buffer zone user committees and Buffer zone Community Forest User Groups 	National Parks and Wildlife Conservation Act 2029 (5 th Amendment) 2073
It has an ad hoc protection strategy.	Fair			
It has a generally relevant protection strategy but is not very effective.	Good	√		
It has a comprehensive and very effective protection strategy.	Very good			

1. State of interaction between government and community during establishment of PA

At the time of establishment, some of the public were against the establishment

Reasons

- People used to access forest resources freely but after establishment they couldn't do so.
- NP was a new concept and it was hard for people to accept any new concept because of poor awareness regarding the effects of NP on conservation and local livelihood

2. Acceptance of local community during PA establishment time

Acceptance level	Highly accepted	Accepted	Not Accepted
Reason			√ (Due to unknown effect)

3. Major conflicts between PA and local community (current time, if any) and conflict mitigation efforts (with evidence)

- Human wildlife conflict-relief, fence
- Theft of natural resources-patrol, legal action, supply from BCFs
- Illegal collection of sand, gravel, stone-control, legal action, patrolling
- Poaching of wildlife-control, legal action, patrol, anti-poaching actions,

3.2.7. Has the PA been effective in the mitigation of human-wildlife conflicts?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Human-wildlife conflicts are significant but poorly addressed.	Poor		<ul style="list-style-type: none"> • Provision of the relief money for life and property loss though a lengthy process. • Reports on relief money provided to wildlife victims • Awareness programs implementation through Users committee, Eco clubs and other groups • Research documents 	<ul style="list-style-type: none"> • People are not fully aware about the compensation provision of wildlife damages. • Still not cover the damages caused by few more animals other than included in Compensation guideline, 2069 • Lack of knowledge awareness among people • Lack of strong infrastructure with people. Weak cages for animals • Lack of proper fences
PA has been able to mitigate few human-wildlife conflicts.	Fair			
PA has been able to mitigate many human-wildlife conflicts.	Good	√		
PA has been effective in mitigating all human-wildlife conflicts.	Very good			

4. Possibility of expanding and extending to wider ecological network/ landscape?

(Assessment will consider the scope of opportunities on the landscape scale that exist. Consider whether any attempts have been made and what are these? Have all the important corridors been identified? What actions are planned/ implemented for their security?)

Probable extension – On Southern Aspect “Kamdi corridor”. If this region can be considered as PA, It can be connected with Suhelwa Wildlife Sanctuary of India thereby increasing corridor and movement of animals in Banke, Bardiya and India as a whole.

3.2.8. Is the site integrated into a wider ecological network landscape following the principles of the ecosystems

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Site not integrated in to a wider network/ landscape.	Poor		BaNPis an important part of TAL connected with BNP in west and Suhelwa Wildlife Sanctuary through biological corridors like Khata and, Kamdi and other national and community forest areas.	
Some limited attempts to integrate the site into a network/ landscape.	Fair			
Site is generally quite well integrated into a network/ landscape.	Good			
Site is fully integrated into a wider network/ landscape.	Very good	√		

3.3 Inputs

3.3.1 Are personnel adequate, well organized and deployed with access to adequate resources in the PA?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Few, personnel explicitly allocated but poorly supported for PA management.	Poor		<ul style="list-style-type: none"> • 79 park staff (39 permanent and 40 temporary) • 15 hattisar staff • And security force. 	<ul style="list-style-type: none"> • All staff should be recruited.
Some personnel explicitly allocated for PA management but not adequately supported and systematically linked to management objectives.	Fair			
Some personnel with fair support explicitly allocated towards achievement of specific PA management objectives.	Good	√		
Adequate personnel appropriately supported and explicitly allocated towards achievement of specific PA management objectives.	Very Good			

This assessment was based on number of personnel allocated for attainment of PA objectives at the Range, Round, Beat and Patrolling camps levels or as relevant to the needs.

- Park was under staffed, but adequately deployed in different locations combining with the army personnel.
- Staff needed skill development trainings and well equipped
- Proposed number of staff must be deployed.

3.3.2 Are resources (vehicle, equipment, building etc.) adequate, well organized and managed with desired access?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Few, if any, resources explicitly allocated for PA management.	Poor		<ul style="list-style-type: none"> • 11 official buildings (1 headquarter, 2 sectors, 6 range posts and 2 posts) • 2 BZ buildings • Vehicles (4 four wheelers and 8 bikes) • Army buildings (3 Headquarter buildings and 11 field posts) • Computer-11, GPS-15, Camera-5, Binocular-5 	<ul style="list-style-type: none"> • More field gears and equipments need to be provided.
Some resources explicitly allocated for PA management but not systematically linked to management objectives.	Fair			
Some resources explicitly allocated towards achievement of specific PA management objectives.	Good	√		
Adequate resources explicitly allocated towards achievement of specific PA management objectives.	Very Good			

- Limited resources like vehicles, bikes, computers, GPS were being adequately distributed and efficiently used though it requires more equipments, resources and technologies to enhance the management effectiveness.

3.3.3 Are financial resources and funds adequate, timely released and utilized for the management of PA?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Resource allocation is adhoc, funds are inadequate and seldom released in time and not utilized.	Poor		<ul style="list-style-type: none"> • Financial reports • Agreements between park and conservation partners for financial and technical supports and reports of fund transfer and providing technical supports. • Work completion reports with financial 	
Some specific allocation for management of priority action. Funds are inadequate and there is some delay in release, partially utilized.	Fair	√		
Comprehensive planning and allocation that meets the most important objectives. Generally funds released with not much delay and mostly utilized.	Good			
Comprehensive planning and allocation of resources for attainment of most objectives. Funds generally released on time and are fully	Very good			

utilized.			transactions.	
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3.3.4 What levels of resources are provided by I/NGOs (IF ANY)?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
NGOs contribute nothing for the management of the PA.	Poor		<ul style="list-style-type: none"> Financial and activities reports provided by the collaborating I/NGOs and programs like TAL, ZSL, IDA and NTNC. 	
NGOs make some contribution to management of the PA but opportunities for collaboration are not systematically explored.	Fair			
NGOs contributions are systematically sought and negotiated for the management of some PA level activities.	Good	√		
NGOs contributions are systematically sought and negotiated for the management of many PA level activities.	Very good			

ZSL has provided support for development of Buffer Zone Community Upgrading

3.3.5 Does PA manager consider resources (human and financial) to be sufficient?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Both Financial and Human resources are not sufficient.	Poor		<ul style="list-style-type: none"> Number of staff and army personnel efficiently posted in different locations. Established and under construction buildings, vehicles and equipments 	<ul style="list-style-type: none"> Regular budget and supports from conservation partners.
Resources are Partially sufficient	Fair			
Resources are sufficient	Good	√		
Both human and financial resources are adequate (fully sufficient).	Very good			

3.4 Process

3.4.1 Does the PA have human resources trained in wildlife conservation for effective PA management?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
No trained officers and frontline staff in the PA.	Poor		<ul style="list-style-type: none"> Records of provided trainings and participated staff. Trainings and orientation classes for specific programs like camera trapping, prey 	Regular trainings on different topic
Some trained officers and few trained frontline staff, posted in the PA.	Fair			
All trained officers and fair number of trained frontline staff posted in	Good	√		

the PA.			base survey etc.	
All trained officers and most of the trained frontline staff is posted in the PA.	Very good		• national and international study tours	

3.4.2 Is there effective public participation in PA management and does it show in making a difference?

Assessment criteria				
Condition	Category	(Tick)		Remarks
Little or no public participation in PA management.	Poor		<ul style="list-style-type: none"> Minute records of the meetings conducted for protected area management plan. 	<ul style="list-style-type: none"> Preparation of development plans of BZ User Committees with active participation of people. Regular interactions, meetings and making decisions with fully consensus. Public participation in patrolling.
Opportunistic public participation in some of the relevant aspects of PA management.	Fair			
Systematic public participation in most of the relevant aspects of PA management.	Good	√		
Comprehensive and systematic public participation in all important and relevant aspects of TR management.	Very good			

Patrolling by user committee? user groups to control illegal activities in buffer zone for sand, gravel, stone collection; participation in patrol (on demand),

3.4.3 Does PA management address the livelihood issues of resource dependent communities (woman, Poor, DAGs, Ethnic Community)?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
No livelihood issues are addressed by PA management.	Poor		<ul style="list-style-type: none"> Ploughing back of around 50% of park income to BZUCs to conduct community development activities, awareness rising programs, community conservation activities. Provision of financial relief for the loss of 	<ul style="list-style-type: none"> Priorities given to women, poor, DAGs and ethnic groups.
Few livelihood issues are addressed by PA management.	Fair			
Substantial livelihood issues are addressed by PA management.	Good			
Livelihood issues of resource dependent communities especially of women are	Very Good	√		

addressed effectively by PA managers.			property, human casualties from wild animals.	
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3.5 Outputs

1. What are the major achievements of management intervention in this PA?
 - a. Fragile Chure Area Conserved
 - b. Endangered Royal Bengal Tiger number increased
 - c. Relation with local communities is comparatively more harmonious compared to the time of PA establishment
 - d. Habitats are managed, improved for other wildlife as well
 - e. In 2022, NP commits to contribute in doubling the number of tigers in Nepal.

3.5.1. Is adequate information on PA management produced and publicly available?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Little or no information on PA management produced and publicly available.	Poor		<ul style="list-style-type: none"> • Leaflets, posters and few books and publications available for limited number of people. • Information about BaNP on the web page of DNPWC (www.dnpwc.gov.np) 	<ul style="list-style-type: none"> • Official web page not well maintained
Produced but publicly available information is general and has limited relevance to management accountability and the condition of public assets.	Fair	√		
Produced and publicly available information provides detailed insight into major management issues and condition of public assets.	Good			
Comprehensive reports are routinely published and available in public domain on management and condition of public assets.	Very good			

3.5.2. Are visitor services (tourism services) and facilities appropriate and adequate?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Visitor services and facilities do not exist.	Poor		<ul style="list-style-type: none"> • Lack of sound tourist supporting infrastructures like display of films, documentaries, • Proper visitor's center • No hotels and resorts nearby the park • Not sufficient 	Lack of sufficient nature guides, vehicles and resorts
Visitor services and facilities are very basic.	Fair	√		
Visitor services and facilities are monitored from time to time and are fairly effective.	Good			
Visitor services and facilities are conscientiously maintained, regularly upgraded and monitored for visitor satisfaction	Very good			

			activities for the tourists	
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Include the existence and quality of visitor and interpretation centers, including skills and capabilities of personnel manning these, PA related publications, films, videos; arrangements of stay (including places serving refreshments and food owned and managed by PA, watch towers and hides including safety factors, vehicles assigned for visitors including riding elephants, if any and their deployment, drinking water, rest rooms, garbage disposal, attended and self-guided services in the field, visitor feedback on the quality of wilderness experience.

3.5.3. Are research/ monitoring related trends systematically evaluated and routinely reported and used to improve management?

Assessment criteria				
Condition	Category	(Tick)	References	Remarks
Little or no systematic evaluation or routine reporting of trends.	Poor		<ul style="list-style-type: none"> • Annual reports of BaNP and DNPWC • Tiger counting • Prey base monitoring • Gradual increase in grassland area • Wetlands and water resources managements • Researches conducted by park, conservation partners and individual students 	
Some evaluation and reporting undertaken but neither systematic nor routine.	Fair			
Systematic evaluation and routine reporting of trends undertaken.	Good	√		
Systematic evaluation and comprehensive reporting of trends undertaken and attempts made at course corrections as relevant.	Very good			

3.5.4. Is PA has provision of conducting regular conservation education program/ extension program and implementing to local community/ school?

Assessment criteria				
Condition	Category	(Tick)	References	Remarks
No specific provision and program	Poor		<ul style="list-style-type: none"> • Documentary on tiger was made and broadcasted on local TV network in the past • School conservation programs, quiz contest, debate program, study tours • Important days celebrations, rallies and interaction programs with BZ people • Sanitation programs • Allocation of fund for conservation education program in BZ development plan 	
There is provision in management plan but no implementation	Fair			
There is provision in management plan but have been less practiced as per plan	Good	√		
There is provision in management plan and have been effectively practiced	Very good			

3.6 Outcomes

3.6.1. Are populations of flora/fauna found in the area stable or increasing?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Threatened/ endangered species populations declining.	Poor		<ul style="list-style-type: none"> Increased number of Tiger reached to 13 in 2017. Prolonged stay period and increased number of Wild Elephant (regular patrolling reports). Stable to increased tiger prey species (Prey base monitoring reports). 	
Some threatened/ endangered species populations declining, some are increasing, most of others are stable.	Fair			
Several threatened/ endangered species populations increasing, most others are stable.	Good	√		
All threatened/ endangered species populations either increasing or stable.	Very good			

This needs to practically relate to the natural ecosystem potential rather than being driven merely by numbers and visibility.

3.6.2. Have the threats to the PA regarding poaching/killing and illegal trade of timber being reduced/ minimized? Or is there an increase?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Threats to the PA have not abated but have enhanced.	Poor		<ul style="list-style-type: none"> Confiscation of wildlife parts and timber Prosecution of the criminals Decreasing rates of crimes Presence of security force and park staff in different strategic points. Regular patrolling SMART patrolling 	<ul style="list-style-type: none"> Awareness raising programs CBAPUs formation
Some threats to the PA have abated, others continue their presence	Fair			
Most threats to the PA have abated. The few remaining are vigorously being addressed	Good	√		
All threats to the PA have been effectively contained and an efficient system is in place to deal with any emerging situation	Very good			

3.6.3. Are the expectations of visitors/tourists generally met or exceeded?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Expectations of visitors generally not met.	Poor		<ul style="list-style-type: none"> Visitor's record's diary with comments and suggestions. All weather roads, view towers, water holes constructed Home stay running 	Recent years no tourists
Expectations of many visitors are met.	Fair	√		
Expectations of most visitors are met.	Good			
Expectations of all most all visitors are met.	Very good			

3.6.4. Are local communities supportive to PA management?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Local communities are less supportive.	Poor		<ul style="list-style-type: none"> Formation of BZ Management Committee, User committees and groups. Minute books of BZMC and UC. 	
Some are supportive.	Fair			
Most locals are supportive of PA management.	Good	√		
All local communities supportive of PA management.	Very good			

3.6.5. Have the threats to the PA from forest fire being reduced/ minimized? Or is there an increase?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
Threats to the PA have enhanced.	Poor		<ul style="list-style-type: none"> Yearly occurrence of forest fire. Joint force (park staff and army force) with available equipment involvement to put off the fire. Use of fire control equipment. 	Very dry place covered with dry leaves and twigs Lack of access to forests Lack of water resources and other equipment
Some fire threats to the PA have decreased, others continue their presence	Fair	√		
Most threats to the PA have abated. The few remaining are vigorously being addressed	Good			
All fire threats to the PA have been effectively contained and an efficient system is in place to deal with any emerging situation	Very good			

3.6.6. Have the threats to the PA from invasive species being identified and reduced/ minimized? Or is there an increase?

Assessment criteria				
Condition	Category	(Tick)	Reference	Remarks
No plan and activities to identify and control problems regarding invasive species	Poor		<ul style="list-style-type: none"> • Identification of invasive plant species Maobadijhar, Hyacinth, Banmara. • Mostly present at grasslands and wetlands. • Grassland and wetland management activities including invasive plant removal. 	
Some species are identified	Fair	√		
Invasive species are identified and protection activities are taking place in some sites.	Good			
All invasive species threats to the PA have been effectively contained and an efficient system is in place to deal with any emerging situation	Very good			

3.7 MEE Score Card

Framework Element Number	Framework Element Name	Number of Criteria (a)	Maximum mark per question (b)	Total (a*b)	Marks obtained for the Element	Overall MEE Score and % age
1	Context	4	10	40	27.5	70
2	Planning	8	10	80	60	
3	Inputs	5	10	50	35	
4	Process	3	10	30	25	
5	Outputs	4	10	40	25	
6	Outcomes	6	10	60	37.5	
		30		300	210	

The grading categories used in this evaluation area as follows

Score%	Grading Category
>80	Very good
65-80	Good
50-64	Fair
<50	Poor

3.8 Over all Management Effectiveness

The overall effectiveness of the management practices of the Banke National Park is found **good** obtaining the mark score 70% (210 out of 300) in effectiveness of management activities implemented in those all six categories. There are many aspects to make improvements to make the management efforts more effective to achieve the intended objectives and goal of park management. The process and planning categories scored highest marks and the categories context and outputs obtained least marks. So considerable attentions should be given to those least mark obtaining categories and the improvements should be made. The weak criteria are mostly related to park values identification and documentation. The evaluation indicated the poor documentation system. So the information achieved from different sources like wildlife survey and census reports, monitoring and patrolling reports and other researches should save, documented and publish in different forms so that the needy people can have easy access to those information. All manpower should be recruited and posted to the fields so that all conservation and development activities can be implemented timely and effectively. A well-equipped "Rapid Response Team (RRT)" should form and give responsibility to combat and deal with forest fire and possible consequences. The assessment also found the poor situation in tourism development sector, a potential sector for revenue generation to the park and ultimate development of the buffer zone. So that park and other concern stakeholders should give priority in infrastructure development and facilities provisions which will contribute to promote the tourism in the area.

3.9 Achievements after Park establishment

3.9.1. Programs and budget

The government of Nepal is providing funds under different programs like National Parks Program, Regional Support for Wildlife Conservation and Rastapati Chure Terai Madhesh Conservation Program. The total amount of government budget that the park has received from the time of its establishment is given in Table 2 excluding the fund provided by conservation partners. The financial and technical supports are also been provided by several conservation partners and programs like TAL, ZSL, and IDA in the past, to conduct various conservation, development and management activities.

Table 2: Program wise budget allocation in different Fiscal Years

Fiscal Year	Programs and the Budget Rs (in '000)				Year wise total budget
	National Park	Buffer Zone	Chure Conservation	Wildlife Conservation	
2067/68	31410	0	0	0	31410
2068/69	9483	229	0	8364	18076
2069/70	7605	642	0	4645	12892
2070/71	9595	2361	3500	7943	21038
2071/72	8233	8363	3633	8070	11866
2072/73	15350	1500	7460	3740	28050
Total	81676	13095	14593	32762	142126

The budget allocation was not similar every year even differed in same program making the total budget unstable (Table 2). The highest amount received by the park was during the park establishment year then sharp decline till the fiscal year 2069/70 with gradual increment then after (Figure 3). It reflects the ad hoc basis budget planning. It could be due to lack of management plan of the BaNP. The budget allocated activities can be groups into five different headings i.e. infrastructural development, conservation and habitat management activities, awareness raising and extension materials productions, trainings and the operational costs of the office (Figure 3). The highest amount was spent in physical structures construction and to cover the operational costs. The infrastructures includes like buildings, forest roads, bridges, embankments etc. The conservation activities and awareness raising programs received 12 and 3 per cent of the total budget of the all years respectively where as remaining 1% budget was used to conduct trainings and income generating activities.

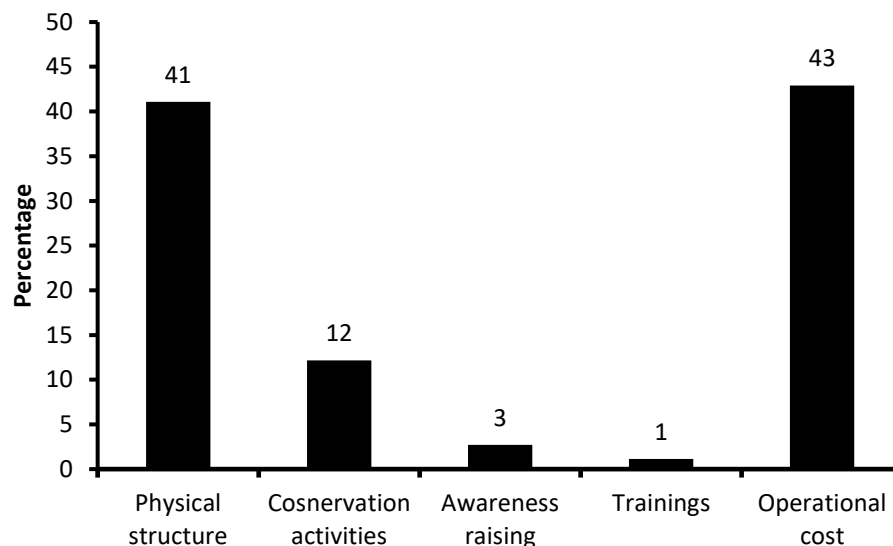


Figure 3: Percentage budget allocation in different programs from the time of parks establishment

3.9.2. Habitat management

The park declaration with clear boundary, strict prohibition in resource use and continuous implementation of conservation and habitat management activities has made dramatic improvements in habitat qualities. The green area has increased than before. The grassland and wetland management were given high priority with appropriate management activities implementation. There were gradual changes in cover types. The previously cultivated lands were changed now into grass and shrub lands, grassland and bush areas into forest lands (Figure 4).

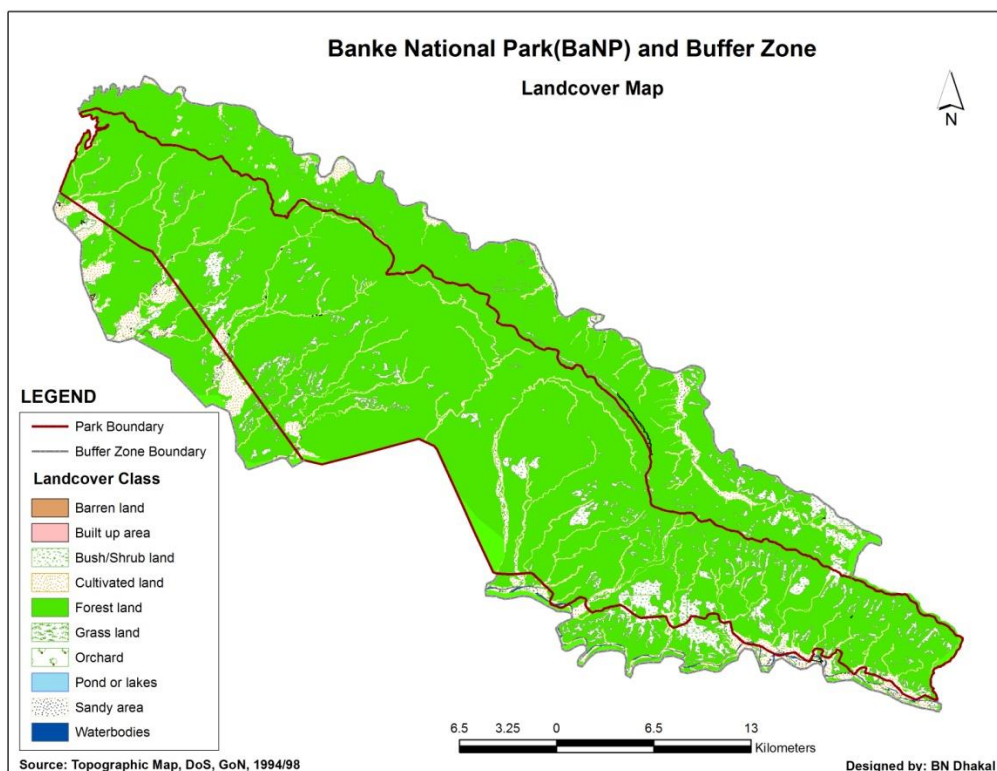


Figure 4: Land cover map of BaNP (Topographic map, DoS, GoN 1994/98)

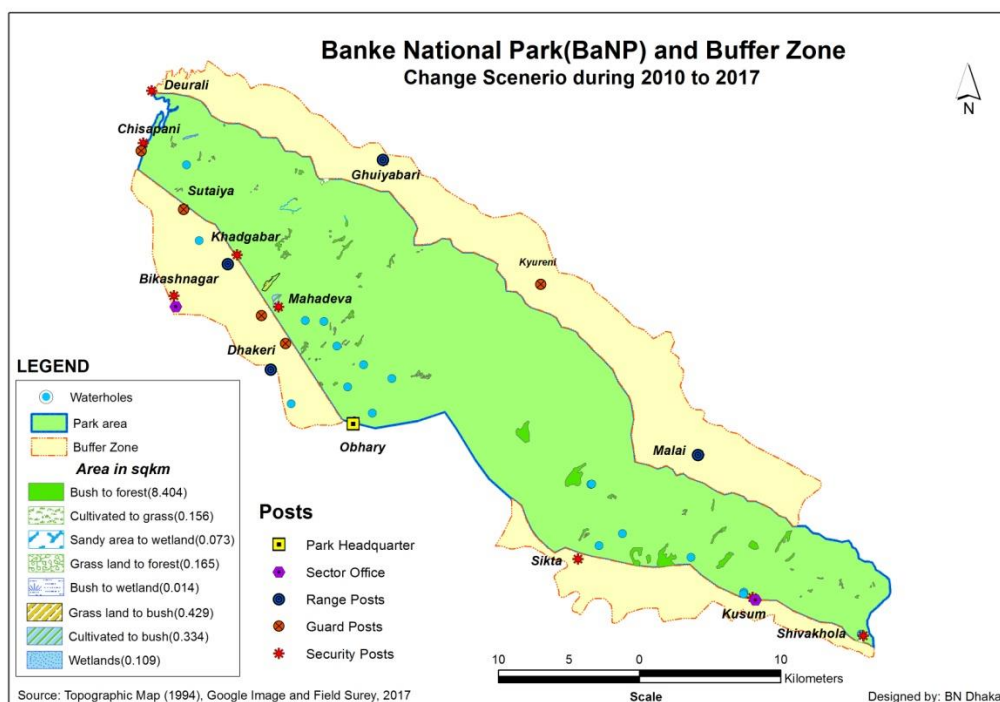


Figure 5: Cover types change scenerio during 2010 to 2017

Grassland management: Banke National Park was established with the aim to contribute in doubling the tiger's population in 2022. To achieve this, the tiger's prey species availability must be good in the park. To maintain the healthy prey base there must be enough grassland to graze and browse. There was around only 1 per cent of grassland coverage in Banke National Park at the time of its establishment. Generally 12 per cent area of park should cover with grassland to maintain a healthy environment for wild animals (BaNP, 2013). The park is implementing grassland management and restoration as a priority program resulting in increased grassland coverage gradually. A total of 150 Ha of grassland has been managed and restored from its establishment till date. For example: In fiscal year 2072/73 BS 46 ha and in 2073/74 BS 15 ha of new grassland area was created respectively. Few important grassland patches of the park like Thuria, Jalseni, Kailase Danda, Muguwa Khola, Khadgabar, Sirukholi, Karaunti Damar, Gotheri, Buchapur, Gharikhare and Chunbhatti areas were regularly managed and restored by cutting, removing small size trees, poles and shrubs and control burning.



Photo 1: Giddeni Chaur grassland management
Photo by: R. Chaudhari, BaNP



Photo 2: Buchapur grassland management
Photo by: L.B. Bhandari, BaNP

Wetland management: Water is one of the most important habitat components for wildlife management. Several unmanaged wetlands were also managed and maintained to improve its quality and fulfill the water requirements of wildlife. For example: a wetland at Jhijhari area. The scattered small and large water holes were identified and conserved. More than 16 water holes were well conserved and maintained at different places inside the park as well as in buffer zone, such as Kohalpur, Khadgabar, Aanpkholi, Sauri, Deurali and Khairi. The solar pumps were also installed in two water holes to pump the water.

Water resource conservation not only helping to provide water for wild animals but also park staff and security forces deployed around. The regular monitoring in those areas also indicated the increasing number of wild animals in and around those sites. In certain areas park has managed cemented pond like structures and water is supplied for animals during very dry periods of the year i.e. Gotheri and Chauka regions.



Photo 3: Jhijari wetland conservation
Photo by: L.B. Bhandari, BaNP

Plantation: To improve the land conditions and mitigate the potential hazards the degraded open lands and the reclaimed encroached areas in BZ were planted with different tree species. It was expected that the plantation will reduce the erosion, landslides and river cuttings providing the suitable habitat for wild animals and forest goods for buffer zone communities in long run.

3.9.3. Species conservation

The park envisages various floral and faunal species and has been conducting different kinds of species focused conservation activities. Reptiles and fish survey, Crocodile survey, Tiger and Prey base monitoring are few activities implemented by park to assess the status of related species. Tiger is the most priority animal of the park. The park was established to fulfill the international commitment of Nepal to double the tiger population in 2022. Many activities regarding to tiger's conservation like documentary production, tiger conservation extension materials production and distribution, periodic tiger monitoring and its prey base monitoring are being executed. The result has been increase in their numbers. There were only signs of few Tiger in BaNP at the time of park establishment which in 2011, showed 3 tigers record and now there are 13 tigers in the park and buffer-zone in 2016/17 (Monitoring report of BaNP). It indicates the improvement in tiger habitat with improvements in its prey base through the improvement in overall management of park including improvement protection. So the park has to develop the mechanism to maintain the quality of tiger habitat to sustain the tiger's population and its prey base considering the potential conflicts and conflict management measures as well.

3.9.4. Organizational Development

For the protection and proper management of the park, an organizational structure with 180 staff including Elephant staff was proposed and only 153 positions were approved. Out of 153 only 94 park staff (39 permanent, 40 temporary and 15 elephant staff) were working there with limited resources and facilities. The park is poor in staff management aspect as only around 50% of

approved staff number is working there in field. A company of Nepal army is working there with full responsibility and close coordination with park authority to protect and safeguarding the park and wild animals. There are park offices established at 17 different strategic points (1 Park headquarter, 2 sector offices, 5 range posts, and 9 posts) which was present at only 10 places few year before. Moreover the local people are also involved in conservation through bufferzone management activities. 77 user groups (55 groups in Banke, 8 groups in Salyan and 14 groups in Dang districts) under 9 buffer zone user committees (6, 1 and 2 committees in Banke, Salyan and Dang districts respectively) and one buffer zone management committee have been formed and actively involved in park and wildlife management activities. The buffer zone comprises a total of 6,602 households with 35,271 population including 18,010 males and 17,261 females. The park has formed 99 buffer zone community forest user groups (BCFUG) covering more than 10,659.02 ha of buffer zone forest. In total 14,612 households with 75,889 populations (37,537 females and 38352 males) are getting benefits from buffer zone community forests (BCF). From the beginning of the park establishment, conservation partners such as WWF Nepal, NTNC, ZSL were active with previous funding of IDA and programs like TAL are implemented and providing financial and technological supports for the effective management of the park and its biological resources.

3.9.5. Infrastructural Development

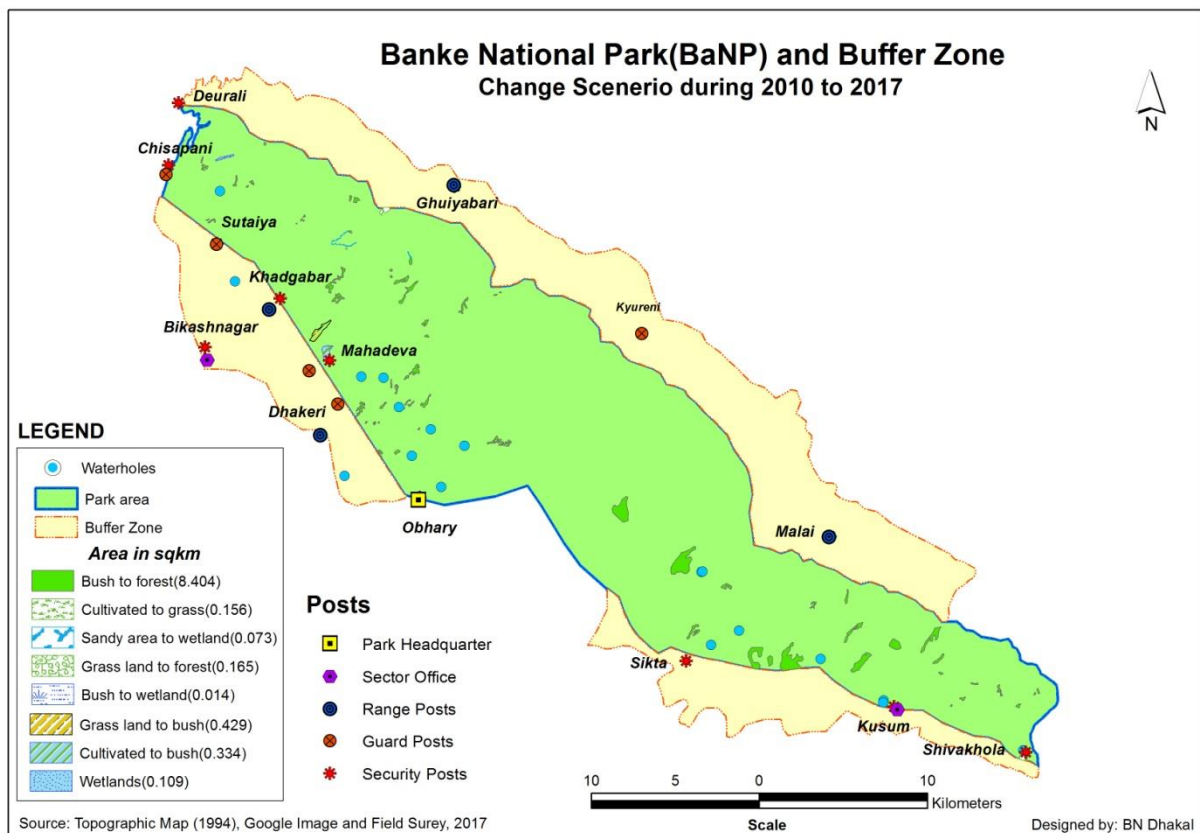


Figure 6: Infrastructure Development inside park and buffer zone

In Park

The establishment of park and declaration of buffer zone opened up many opportunities for infrastructural development in the area (Figure 6). At the time of establishment, many parts of the park were inaccessible causing less efficient and effective implementation of conservation operations and hampering to achieve conservation goals. Gradual development and construction of structures like office buildings, forest roads, fire-lines, bridges, water holes, water holes and view towers facilitated to mobilize regular patrolling and to conduct park management operations, most importantly, the promotion of eco-tourism. Park as well as local people is getting benefits from gradual development of tourism in the area. Few "home stay" stations have already been started focusing domestic as well as foreign tourists.

Official buildings and road network: The office buildings and army posts at many places were already completed and few are under construction. At present, there are 11 park building including 1 park headquarter, 2 sector offices, 5 range posts, 1 security post and 2 posts and 14 army buildings including 3 headquarter buildings and 11 field posts were constructed and operational. Park authority is planning for more structures as required in the future.

For safe travel and enhance the connectivity among the security posts and park offices inside the park, around 60 Km out of 140 Km total forest road network has graveled to facilitate the mobility in all seasons. Park is planning to gravel the total length of the road to enhance the mobility throughout the year. Similarly the wooden bridges were also constructed at several places. Buffer zone people are also allowed to use certain routes.



Photo 4: Gravel road to go to Hattisar at Changainala
Photo by: R. Chaudhary, BaNP



Photo 5: Giddeni Chaur Water Hole
Photo by: R. Chaudhary, BaNP

Water resource conservation: The 53% of the park area falls under dry zone of Chure and Bhabar, with very limited water resources. The identified water holes and wetlands in these areas were needed to be conserved and maintained for its optimum use in wildlife conservation. Till date, 16 water holes were managed inside the park to fulfill the water requirements of the wildlife for example Giddeni Chaur Water Hole (Photo 2).

Two solar pumps were also installed in two places to regulate the water. The artificial structures locally known as “Dund” were also constructed at several dry places where the park itself supplies water to fill up such structures during very dry periods. Such practices proved advantageous to flourish the wildlife population near and around such structures.

View tower: Three concrete and four, wooden view towers (Machans, Photos 7-8) were constructed at different points inside the park. One can have a good landscape view of surrounding areas from the top of the tower. It facilitates to monitor the wildlife activities as well as to spot out the incident places like fire occurring areas and can quickly inform the rapid response team or task forces. It is anticipated to act as attractive point to promote eco-tourism and can help in research activities as well.



Photo 6: KailaseMachan
Photo by: P. Gautam



Photo 7: KhairiMachan
Photo by: R. Chaudhary

In Buffer zone

Nepal government and conservation partners are providing financial and technical supports for the developmental and conservation activities in buffer-zone. According to NPWCA 2029 & Buffer Zone Management Regulation, 2052 BS, the park has been investing 30-50 per cent of its annual income back to buffer zone communities. Till 2072/73 government has provided total budget of NRs.1,30,95,000.00 to conduct the developmental as well as conservation and awareness raising activities as guided in the guidelines. As there is no certainty in revenue collection, the yearly ceiling of the BZ budget is also uncertain. In addition to government budget, the conservation partners are also supporting to establish and manage the offices of buffer zone user committees, buffer zone management committee and many community forest user groups. For example: With the support of BZ and TAL program, two buildings one for BZMC and another for Kohalpur Buffer Zone User Committee were constructed. The fund was also provided to conduct other development activities like gravelling the roads, fencing to control grazing and encroachment, fire-lines construction in buffer zone community forests, drinking water supply (Jaljala drinking water supply), check dams and river training structures, bio-gas

plants, improved stoves, solar pump (Giddeni Chaur), mesh cage for goat farming and solar panels to households.

3.9.6. Awareness and capacity building

There was change in people's perception towards park. The attitude of most of the peoples was positive which is improved from the time of park establishment. The investment on the developmental activities, awareness raising activities and other supportive programs played vital role to change the people's attitude. The awareness raising programs, trainings and other various interaction programs with buffer zone people helped to bring change in people's perceptions. From its establishment, park has been organizing different kinds of awareness raising and capacity building programs for Buffer zone communities such as biodiversity conservation related school program, biodiversity conservation interaction program, training for buffer zone community forest guards about safety measures inside forests, etc. The park in close coordination with conservation partners also organize many trainings and discussion programs with buffer zone user institutions, local groups, local and regional media persons, security persons to share the knowledge and collect the views on park and wildlife management and other important issues. The documentaries and videos regarding the park and wildlife management issues were also prepared, broadcasted and distributed to BZ committees, local and regional medias and concerned organizations. The park is also using local FM radios and newspapers to disseminate the news and information to aware the people about the park, its importance, legal provisions, threats, potential risks and safety measures.

The park is also regularly developing and distributing the posters and pamphlets as means of information dissemination. These materials are provided to the people through park offices and also distributed during gathering and celebrations of important conservation festivals and events like world wetland day, world tiger day, wildlife week, world environment day and national park establishment day. Park also organizes activities like rallies, jungle tours, quiz contests, cleaning local areas and office periphery during such days.



Photo 8: Community based anti-poaching training
Photo by: L.B. Bhandari

Park has also put signboards at many places within and outside of the park holding conservation related messages. This massive effort has contributed to reduce conflict and hatred between park and people. Besides the loss and pain caused by wild animals, people are being very positive and supportive to park and conservation of wild animals.

3.9.7. Revenue generation and Income generation activities

Revenue: Forest products, financial punishment in legal prosecution, construction material fee, and tourist entry fee were the main sources of revenue collection. Recently the construction material collection has been stopped. The 30-50 % of collected revenue is invested in community development activities through buffer zone user committees. The committees are asked to prepare an annual plan and propose the budget. Then the BZMC evaluates the proposals and make decisions. Besides this fund, the conservation partners like TAL, ZSL, and NTNC are also providing financial supports and programs for community development. Investment in income generation activities is giving a good sign. Annually the park and conservation partners are providing money and material supports to individual and groups of people to start income generating activities. For example: In fiscal year 2072/73 BS, 6 BCFUGs were selected and provided each with NRs.2,00,000.00 to conduct income generation activities according to the proposal submitted by them. Vocational trainings are also provided to the users so that they can get some additional incomes. In 2072/73 BS, “basic level of tailoring training” was organized for the users of Rapti and Purandhara Buffer Zone User Committees. Similarly the local farmers of Rajkot BZUC were benefited from “agriculture and veterinary training”. The trainings like off season vegetable production, nature tourist guide, operating medicinal plant producing nursery and medicinal plant farming were also given to users according to the demands of the users. The nurseries and farms at Kusum and Ovari are producing medicinal plants like Kurilo-*Asparagus racemosus*, Lemon grass-*Cymbopogon* spp., Mentha-*Mentha* spp., and Chamomile-*Matricaria chamomillato* earn additional income.

Table 3: Status and sources of revenue collection in different fiscal years

S.N.	Descriptions	Fiscal year					
		2067/68	2068/69	2069/70	2070/71	2071/72	2072/73
1	Entrance fee		31500.0	4000.0			
2	Vehicle charge		18000.0	1000.0			
3	Fined amount	208849.0	160500.0	382100.0			
4	Construction material charge	611252.0	952724.0	1259389.0	946913.0		
5	Tender form	53000.0	32300.0	31000.0	257800.0	3300.0	460000.0
6	Khadkhadai charge		38380.0	77725.0	98975.0		
7	Forest Development Fund		12000.0	96878.0			
8	Timber collection charge and revenue			3005922.0			
9	Charge of leased forest land			1766887.5			
10	Auctions		67476.0		15815475.9	35300.0	
11	Back locked auditing		2703.4				47746.7
12	Land rent charge		242625.0				
13	Fine amount during legal		183875.0	275812.5	445230.5	606684.6	1823366.0

	prosecutions						
14	Forest products					3843463.1	14852122.0
15	Others			8930.0			15000.0
Total		8,73,101.0	17,42,086.4	69,09,644.0	175,64,394.4	44,88,747.7	171,98,234.7

Source: Banke National Park, Annual progress report (2016)

Tourism: National parks like Chitwan and Bardia are gaining ample amount of revenue from tourism and the people are being benefited socio-economically. BaNP was also a tourist's destination at the initial time and had earned limited amount of revenue in 2068-2070 BS but it could not continue and sustain that opportunity (Table 3).

BaNP is comparatively young national park, and compounded with limited infrastructures and lack of extension works required for tourism development in and around the park causing the area getting less attention from tourists during recent years and the investors as well.

Adequate infrastructure development, proper extension works in regional, national and international levels, bringing public/private investors in tourism and doing effective conservation activities can help to flourish tourism in the area and can contribute in revenue increment. Coordination and collaboration with Bardia National Park (BNP) and the representatives from the tourism business of BNP can help to continue and flourish the tourism business in BaNP too.

Initiation is started in few areas including a Home Stay at Gawar. ZSL has also provided a basket fund of NRs.500000.00 for the development and running of that home stay. Now Gawar Valley Community Home Stay (Photo 10) is becoming a destination for local visitors and aimed to attract more local, regional and international tourists. At present, it is giving part time jobs to 15 local peoples. It is believed that the success of this home stay will help to flourish tourism in the area again.

Table 4: Revenue collection from tourism during fiscal years 2067/068 to 2069/070

S.N.	Fiscal year	Revenue (NRs.)	Remarks
1	2067/068	873091.00	
2	2068/069	1742086.36	
3	2069/070	6909644.00	
Total		9524821.36	



Photo 9: Study team interacting with Chairperson Gawar Valley Community Home Stay

3.9.8. Hazards reduction

Forest fire: Forest fire is always been a challenging threat for park management. Dry period between Falgun to Ashad is very sensitive for fire occurrence. The park has formed a rapid response team (RRT) to collect the fire incident information and act on it. The team includes park staff and army force. The causes were found mostly the negligence of human so awareness

raising programs were also organized in such potential areas. Meanwhile the park authority regularly cleans and maintains fire lines and also constructing more fire lines to control and reduce the impact of fires. The local people are also involved to put off the forest fires.

Erosion and landslide control: The fragile and erosion prone Chure and Bhabar covers 53 % of BaNP. The numerous seasonal torrents and rivers flow through park caused erosion, landslides and river side cutting during rainy season. Often erosion may cause property damages and human casualties. Understanding such potentialities, the park has been implementing many small to medium scale soil conservation and gully and river training programs like check dams, river embankments, torrent control, plantation, construction of water holes, and causeways. Embankments at Syalmare River, gabion check dam at Paruwa River, Baghsal River, are some examples.

3.9.9. Anti-poaching operation

The park authority has been operating anti-poaching operations regularly in different forms to reduce and control the illegal activities inside and outside the park area. Poaching control patrolling, sweeping operation and campaign, establishment and mobilization of Community Based Anti-Poaching Units (CBAPU) and the active involvement of Wildlife Crime Control Bureau (WCCB) in the area were few important approaches the park has been implementing to control the wildlife crimes. There is a network of informants active in the area to collect the information regarding to wildlife crimes. The network is been very helpful in arresting the criminals and to bring them for prosecution under National Parks and Wildlife Conservation Act, 2029 BS. Every year many people were arrested and prosecuted for their involvement in wildlife crimes. The patrolling team has seized groups of people inside the core area and confiscated the weapons and illegally collected materials (Photo 13). They were arrested with the evidences like rifles used for hunting, bullets, wildlife trophies, vehicles used, other weapons and illegally harvested timber and other forest products. Every year in an average 20 to 25 individuals had been trialed for involvement in wildlife crimes. Such a cumulative effort is contributing a lot in controlling wildlife crime increasing the conservation effectiveness.

3.10 Constraints

The park has not yet got its management plan approved. Lacking of this, the park management activities are running based on annual plans. Besides this, there are other constraints such as insufficient budget, human wildlife conflict, loss of wild animal on road accidents, limited use of advance technologies, and poaching and extensive dry and fragile area. To manage park effectively, these constraints and limitations are to be addressed.

3.10.1. Human wildlife conflict and Relief

Human wildlife conflict is a growing problem in Banke National Park. The conflict is not only limited to prohibited resource uses but also property damages caused by wild animals. People has complains on crop and property damages from wild elephant. Common leopard is killing

domestic animals including cattle, goats, sheep, and pigs. In the fiscal years 2072/73 and 2073/74 BS, a total of 56 and 30 domestic animals were killed by common leopards. It shows the common leopard as the most problematic animal causing 100% livestock damages in the area and for the increasing hatred of people towards park and wild animal conservation. Similarly the number of Bengal Tiger is also increasing and the conflict is obvious in some point.

So the park should assess the potential future consequences of increasing tiger population and must prepare the measures to tackle with it. Though the damages are not compensable, park and buffer zone committees are providing certain amount of financial relief to the owners/victims according to “*Wildlife damage relief guidelines 2069 (second amendment 2074,)*”.



Photo 10: Mesh net covered pen house

In fiscal years 2072/73 and 2073/74 BS, the total amount of NRs.105124.00 and NRs.114540.00 were distributed respectively to the victim's families. The park and conservation partners are also providing support to construct pen with mesh wire for goat rearing. The children of wildlife victims were also provided financial support for their education. The human settlements about 28 households were also trans-located from Gotheri of Kusum the park area to Bishalnagar of Kohalpur. Moreover the provision of relief money, regular awareness raising and interaction programs are helping to change people's negative perception and bring them back to participate in conservation activities. In certain places the solar panels were also installed for supplying power to fence (Photo 11). Park has not yet recorded the proved evidence of retaliatory killings but people were being arrested for hunting and killing the wild animals. Even the patrolling teams have caught people with gun/arms from inside the core area (Photo 12). The records also proved the use of dogs in killing wild boars and deer.



Photo 11: Solar panel installation for fence.



Photo 12: Arresting the hunter inside park by patrolling team.
(Source: BaNP, 2016)

3.10.2. Technologies to combat threats and challenges

The effectiveness of conservation activities can be enhanced many fold by using new and smart technologies. There are many successful examples of incorporating new technologies in conservation fields and achieved good results. The implementation of SMART patrolling system in Chitwan National Park resulted in reducing poaching and other illegal activities inside park near to zero. The Drones are being used in other protected areas to monitor the illegal activities in sensitive areas, monitor the wildlife activities and counting or do census the wild animals. But it demands sufficient and regular fund, special trainings for the staff and a strong monitoring and evaluation mechanism. Banke National Park is also implementing the SMART patrolling and getting good results. Moreover, it needs to introduce other advance technologies in park management scheme to control the threats like wild animals and timber poaching, prompt identification and control of forest fires, mapping the extension of invasive species, to monitor and study the animal behaviors. Right now the park is using Closed-circuit television (CCtv) systems to monitor certain areas like the highway activities. It has installed 6 cameras along the highway and there is control rooms at park headquarter to operate and monitor them. It is in very limited area and need to be expanded to the more sensitive areas where frequent monitoring is required.

3.10.3. Sustainable funding

The annual budget allocation by Nepal government for the park management is fluctuating from 12.89 to 31.41 million Nepali Rupees (Figure 3) which is not sufficient to run the conservation activities effectively. The effective conservation and management of protected area (PA) demands a substantial amount of budget mostly that received towards higher end in last six years. The park needs well trained manpower fully equipped with advance equipment to tackle the emerging threats and challenges. The use of conservation drones, advance communicating systems, surveillance cameras set in strategic places and access to other new and efficient Real Time SMART technologies can enhance the management system of the park and maintain its values for what it was established. Contrary to this, the park has to run with limited manpower,

insufficient facilities and field gears, based with limited technological knowledge. So the Government of Nepal (GoN) must provide the required amount of fund itself or by collaborating national and international conservation partners and donors for the parks appropriate managed.

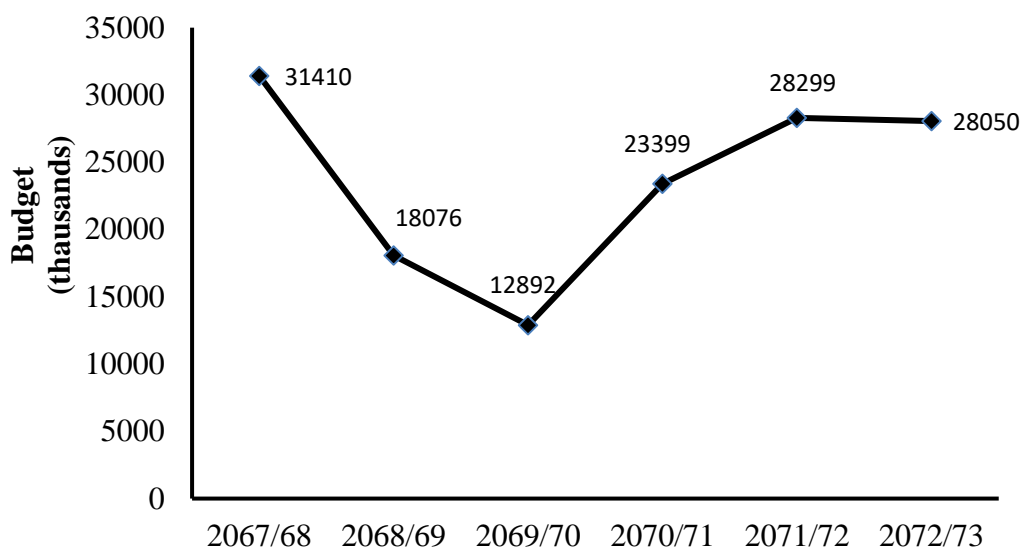


Figure 7: Budget allocation in different fiscal years in Banke NP

3.10.4. Road accidents

Annually number of wild animals were killed in road accident mainly within the portion of East-West highway from Muguwa River to Agaiya. Mostly the Wild boar (*Sus scrofa*), Spotted deer (*Axis axis*), Porcupine (*Hystrix indica*), rhesus macaque (*Macaca mulata*) and Hare (*Lepus* spp.) were killed in road accidents. Sometimes the protected animals like Hyaena (*Hyaena hyaena*), Leopard cat (*Prionailurus bengalensis*) and Four-horned Antelope, Chauka (*Tetraceros quadricornis*) were also killed. The deer and antelope were also been killed by dogs used for hunting purposes. The park authority realized that the animals use to cross the highway to go to Rapti River towards south for use of water (as the core zone north to highway is very dry) where they clash with the vehicles. The highway is in many location turns where the wild animals trying to cross is not visible from far thus even vehicle would find difficult to stop to save the wildlife even if seen in such bends Table 3 shows that 43 wild animals were killed in Fiscal year 2072/73 alone by road accidents in BaNP. Similarly in FY 2073/74, 61 out of 89 dead wild animals were killed in road accidents. The vehicle owners and drivers were also consulted about the accident to find out the reasons and the responsible one, as discussed above the design of road as curved near animals crossing is one of the main limitation and high speed due to straight forward in few places with careless drivers and first time travelling owners among the few.

To minimize the accident numbers, the park has fixed the speed of vehicle and the time to cross that part of highway. The Park has set Closed-circuit Television (CCTV)

cameras at many points along the highway to monitor the vehicles passing through it and to assess the illegal activities and accidents if happened. Still the accidents are

taking place and animals are being killed in road accidents every year (Table 5) though declining for many species excluding wild boar. A proper and strict monitoring mechanism should imply to increase its effectiveness along with the awareness raising to drivers and vehicle owners may help to reduce this kind of incidents. Stringent application of legal measures to careless drivers and owner after the awareness and monitoring is equally important.

Table 5: Wild animals killed in road accidents

S.N.	Species	2072/73	2073/74
1	Wild boar	18	24
2	Spotted deer	8	5
3	Jackal	5	1
4	Leopard cat	1	0
5	Hyaena	1	0
6	Chauka	1	0
7	Others	9	31
Total		43	61

4. Conclusion

Though there are many threats, challenges and constraints in finance, human resource and other facilities, the continuous and untiring involvement of park authority and Nepal army with the optimum utilization of limited resources and getting the active and close participation of local people with the continuous technical and financial supports of conservation partners is helping this park to achieve its conservation goals and objectives better in given short span of time compared to many others in the past. The assessment has showed the overall good management status of the park by identifying some aspects to improve. The increased number of Bengal tigers (*Panthera tigris*), emergence of Wild elephants (*Elephas maximus*) with longer stay, hyaena, carnivore prey base species, higher number of four-horned antelope and other important wild animals are few valuable indications of its effectiveness of conservation efforts. Slowly growing trend of tourism is also indicating the cumulative positive impact. Human wildlife conflict and the caused damages are the most prominent problems and provisioning relief money to the victims without any delay could be a promising option to minimize people's hatred towards park and wild animals. But park authority and government agencies should not take it as a panacea for wildlife conflict, other alternatives such as permanent source of fixed money to each buffer zone user committee to deal immediately should be provided which will certainly help garner the good faith and trust in human wildlife conflict instances.

Broadly, the planned socio-economic and institutional actions are required to address the conservation threats and challenges such as awareness raising for the importance of biodiversity and the services it provides, developmental activities inside the park and in buffer zone, provisioning infrastructures for tourism development with close collaboration with local institutions as tourism can contribute a lot in local and national economies. The extension of wildlife habitat towards south by upgrading the forest legal status would certainly help foster the existing legal actions being taken and help build tiger corridor with Suhelwa Wildlife Sanctuary in India. Moreover the management plan of BaNP is urgently needed to facilitate the course of conservation activities and the arrangement of proposed human resources with adequate trainings and facilities will help to implement the conservation plans and activities more effectively and efficiently.

5. Recommendations

1. Information management system of the park requires efficient technology to handle the information regarding to park and its resource management collected from various sources.
2. Park authority should implement the soil and water conservation activities as a priority program by considering the soil fragility, erosion sensitivity and the dryness of the area.
3. Knowing the potentiality of tourism in socio-economic development of the area, park and concerned stakeholders should implement the management plan and improve it in integrated fashion to create a suitable environment with required infrastructures conserving the values of the park.
4. Invasive species is emerging as a threat which requires long term research with close monitoring for the management being practiced
5. Upgrading the existing highway monitoring system and making aware the vehicle drivers is essential to reduce the wildlife's road accidents. Conserving water resources at northern part of the park and designing under passes/improving use of existing bridge as under pass along the highway to facilitate movement towards Rapti River for use of water.
6. The common leopard damage to livestock should be quickly relieved and the existing damage minimizing mechanism should be promoted like mesh netted goat house.
7. The management plan should be implemented and the government of Nepal should sanction/coordinate to collaborate for sustainable financing to run the management.
8. The expansion of park area up towards south Rapti River may reduce the illegal activities and the park people conflict regarding to resource use. But the comprehensive discussions between park authority, buffer-zone people and other stakeholders have to be continued.

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Annexes

1. Additional Criteria on Climate Change: Is the protected area being consciously managed to adapt to climate change?

Condition	Category*	(Tick <input type="checkbox"/>)	Comment/Explanation	Next Steps
There have been no efforts to consider adaptation to climate change in management	Poor	√		
Some initial thought has taken place about likely impacts of climate change, but this has yet to be translated into management plans	Fair			
Detailed plans have been drawn up about how to adapt management to predicted climate change, but these have yet to be translated into active management.	Good			
Detailed plans have been drawn up about how to adapt management to predicted climate change, and these are already being implemented	Very good			

2. Additional Criteria on Climate Change: Is the protected area being consciously managed to prevent carbon loss and to encourage further carbon capture?

2. Condition	Category*	(Tick <input type="checkbox"/>)	Comment/Explanation	Next Steps
Carbon storage and carbon dioxide capture have not been considered in management of the protected area	Poor	√		
Carbon storage and carbon dioxide capture have been considered in general terms, but has not yet been significantly reflected in management	Fair			
There are active measures in place to reduce carbon loss from the protected area, but no conscious measures to increase carbon dioxide capture	Good			
There are active measures in place both to reduce carbon loss from the protected area and to increase carbon dioxide capture	Very good			

3. Have the threats to the PA from forest fire being reduced/minimized? Or is there an increase?

Assessment criteria				
Condition	Category	(Tick)	Reference document(s)	Remarks
Threats to the PA have enhanced.	Poor			Very dry place covered with dry leaves and twigs Lack of access to forests Lack of water resources and other equipments
Some fire threats to the PA have decreased, others continue their presence	Fair	√		
Most threats to the PA have abated. The few remaining are vigorously being addressed	Good			
All fire threats to the PA have been effectively contained and an efficient system is in place to deal with any emerging situation	Very good			

4. Have the threats to the PA from invasive species being identified and reduced/minimized? Or is there an increase?

Assessment criteria				
Condition	Category	(Tick)	Reference document(s)	Remarks
No plan and activities to identify and control problems regarding invasive species	Poor	√		High on grassland areas
Some species are identified	Fair			
Invasive species are identified and protection activities are taking place in some sites.	Good			
All invasive species threats to the PA have been effectively contained and an efficient system is in place to deal with any emerging situation	Very good			

1. Are cultural heritage assets protected?

Assessment criteria+				
Condition	Category	(Tick)	Reference document (s)	Remarks
No plan and activities to protect cultural sites.	Poor			
Some cultural sites are identified	Fair	√		

Sited are identified and protection activities are taking place in some sites.	Good			
Site specific plan for each sites are prepared and protected.	Very good			