

Report on
Record Management of Physical Infrastructures using GPS/GIS in
Chitwan National Park



Prepared by

Ajit Yadav

Ranger

Chitwan National Park

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EXECUTIVE SUMMARY

Chitwan National Park is rich in flora and fauna and is home to one of the last populations of one horned rhinoceros and is also one of the last refuges of the Bengal tiger in low land of Nepal. CNP, established in 2030 (1973), is the first National Park of Nepal. The Park, which constitutes an important component of Terai Arc Landscape, is a biodiversity hotspot as designated by Conservation International and a WWF Global Eco-region. It is located in the southern central Terai of Nepal with initially 544 Km² area of the Park which was then extended to 932 Km² in BS 2034. Recently, in 2073, the area of the Park reached to 952.63 Km² as a result of addition of Padampur into the Park and readjustment of the area by excluding Gajendra Mokchhya Dham of Tribeni. It extends over four administrative districts of Province number 3 and 4 of Nepal: Chitwan, Nawalpur, Parsa and Makwanpur. Due to its outstanding universal values it has been inscribed in the World Heritage Site in 1984 under the UNESCO criteria vii (natural beauty), ix (ecological processes) and x (habitat for endangered species). In 1996, an area of 750 Km² hectares consisting of forests, human settlements and private lands surrounding the Park was declared as a Buffer Zone. Recently, the area of buffer zone is 729.37 sq. km. In 2003, Beeshazari and associated lakes within the BZ were designated in Ramsar site as a wetland of international importance.

This proposed work is expected to record and mapping of variety of physical infrastructures located within park to address the gap of habitat management activities and to promote area as a tourism hub in near future. Key informant interviews, field level consultation workshops, direct observation and GPS survey were carried out in park. Data were analyzed using descriptive statistics and were presented in map using Arc Map 10.2.1 and tables. The location of waterholes, grasslands, watch tower, administrative division, bridges/culverts, fire line, foot trail, Forest Road/paths, linear infrastructure, settlement etc. prevailing in the park were explored. This study concludes that existing management initiatives are less and unevenly distributed in addressing the conservation of flagship species. There is need of enhancement of effective habitat management activities taking in account topography of the site along with planning the site effective management techniques.

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1. INTRODUCTION AND BACKGROUND

Earth is considered as the Life Supporting Planet. It is only on Earth we know that life can be sustained. Yet human activities are progressively reducing this planet's life supporting capacity, while rising human numbers and consumption make increasing demands on it. To take the human population and wildlife population side by side, many conservation programmes were initiated. Among them, the concept of Protected Areas is the one (John et al., 1986). Nepal lies in between Palaearctic and oriental (Indo malayam) realms. The northern part lies under Palaearctic realms while the southern part of the country falls under the oriental realm. Nepal comprises only 0.09% of land area on global scale but it possesses a disproportionately rich diversity of flora and fauna. The altitudinal variation ranges from about 60m to through the top of the world (8,848m) has made Nepal a rich country in bio-diversity. It has 35 forest types, 75 vegetation units and 118 ecosystems.

CNP has a long management history and it has experienced several management models right from its establishment to the current stage. Several experiences have been gained with these attempts to solve the pertinent problems of conservation and management. These experiences have not only proved the effectiveness of Park management but also provided a clear direction for management of other Protected Areas of the country.

Established in the year 1973, Chitwan National Park has been effectively supporting habitat for globally threatened species along with biodiversity conservation. To upgrade the conservation principle, buffer zone concept was also established in the park area. There are various physical infrastructures built within the park to meet the motto of conservation and various wildlife habitat management activities such as grassland, waterholes, watch tower, fire line etc. have been constructed within the park. The proposed work on "Record management and mapping of physical infrastructure of Chitwan National Park using GPS and GIS" is expected to record and mapping of variety of physical infrastructures located within park to address the gap of habitat management activities and to promote area as a tourism destination in near future. All the habitat management activities stated above are evident in Chitwan National Park and very little research and documentation related to physical infrastructures have been conducted to date. So, it is very important to document such management activities occurred in NP that acts as a baseline for further researches to be carried out and address the gap of conservation.

2. DESCRIPTION OF THE CHITWAN NATIONAL PARK

The park is situated in south central Nepal, covering 952.63 sq. km. in the subtropical lowlands of the inner Terai. The area comprising the Tikauli forest-from Rapti river to the foothills of the Mahabharat-extending over an area of 175 sq.km. was declared Mahendra Mriga Kunj (Mahendra Deer Park) by the late King Mahendra in 1959. In 1963, the area south of Rapti River was demarcated as a rhinoceros sanctuary. The area was gazetted as the country's first national park in 1973, recognizing its unique ecosystems of international significance.

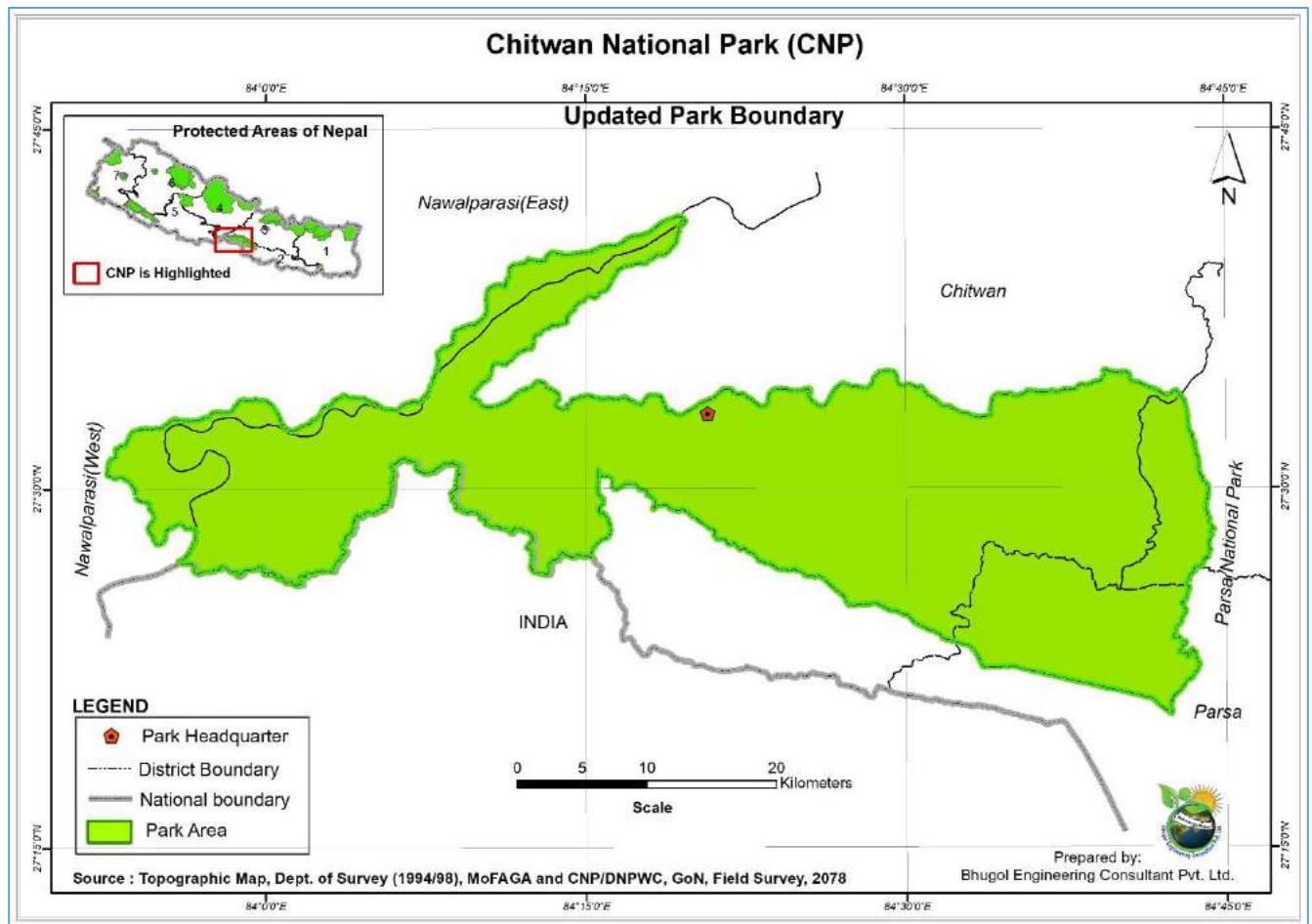


Figure 1: Park Boundary

2.1 General Information

The boundary of CNP is duly notified and demarcated on the ground. The boundary of the Park as per Nepal Gazette dated 2073/07/01 (October 17, 2016). Chitwan National Park (CNP) and its Buffer Zone (BZ) is situated in southern part of Province no.2, 3 and 4 of central Nepal which

spreads over Chitwan, Nawalpur, Parsa and Makawanpur districts. The geographical location of the Park is between N 27° 20' 19" to 27° 43' 16" latitude and E 83° 44' 50" to 84° 45' 03" longitude whereas the geographical location of BZ is between N 27° 28' 23" and 27° 40' 38" latitude and E 83° 43' 08" and 84° 47' 38" longitude. The area of the Park, when designated in 1973, was 544 km². It was later extended to 932 km² in 1977. Now the area is 952.63 km² and 729.37 km² of Park and BZ after the amendment of boundaries by the Government of Nepal (GoN) in 2016. The Park covers parts of Chitwan, Parsa, Makwanpur and Nawalpur districts. These districts comprise of 74.04%, 15.45%, 6.97% and 3.54% of the total area of the Park respectively. Rivers, hillocks, fire lines, Nepal-India international border forms the major boundary of the park.

2.2 Significance

- The Park provides habitat for globally threatened species, notably, the Greater Onehorned Rhinoceros, Royal Bengal Tiger and Gharial Crocodile;
- The Park has high species richness with 31 % of mammals, 61% of birds, 34% of amphibians and reptiles, and 65% of fishes of the species that are recorded in the country;
- The Park has the fame as one of the highest concentrations of the birds (541 species) in the World;
- CNP is an outstanding example of a unique assemblage of native flora and fauna of the Siwalik and inner Terai ecosystem;
- CNP is one of the main part of Terai Arc Landscape (TAL) adjoining with Parsa National Park (PNP) of Nepal and Valmiki Tiger Reserve (VTR) of India;
- The Park consists of the youngest fragile Siwalik-hill ecosystem which represents ongoing geological processes;
- The Park was inscribed as a World Heritage property due to its Outstanding Universal Value (OUV) in 1984 under the natural category;
- The Beeshazari Tal and its associated lake series, that lies in the BZ is listed as Ramsar site, a wetland of international importance, in 2003;
- The Park is the first National Park designated as CA/TS Assured in 2015;
- The Park is also one of the Important Bird Areas (IBA) of Nepal;
- The Park is among one of the most popular tourist destinations of Nepal;
- Bikram Baba at Kasara, Valmiki Ashram in Tribeni and Panch Pandav at Madi are the most famous pilgrimage places of religious values for Hindus of nearby areas of India as well; and
- CNP is also the land of indigenous Tharu community who have been living in the area for centuries despite the epidemic of malaria in the past.

Ecological Boundary

The Park has unique landscape which is an amalgamation of floodplain grasslands, Churia hills, riverine forest, tropical Sal forest and the aquatic system of Narayani, Rapti and Reu rivers along

with many tributaries and various lakes. The Park has landscape contiguity with PNP to the east, VTR of India to the south, lesser Himalaya in north through the forest corridor of Barandabhar and Daunne forest connects it to the Churia range in the west. The combined area of CNP, PNP, their BZs and linkages with nearby forested area comprises over 2,439 km² and forms the largest Protected Area (PA) complex in Terai and Siwalik. Thus, the Park along with surrounding landscape is supposed to be ecologically inclusive. However, CNP represents all types of habitats of the region. The aquatic habitat is not adequate to ensure movement and long-term survival of gharial, Gangetic dolphin and other aquatic fauna.

2.3 Geology and Soil

Chitwan valley lies within the Siwalik belt and consists of thick alluvial deposits. There are several geological formations in the Park which comprises late tertiary Siwalik formations in the south (Churia and Someshwor hills) and Rapti and Chitwan duns (inner valleys) to the north. Soil of the valley is mostly sandy and loamy whereas coarse bedded sandstone, crystalline rocks, clays and conglomerates are found in the south. The soil found in the Park and BZ are brown shallow soil, brown black and red soil, black soil, brown soil, wet welldrained soil, poorly drained brown soil and well sorted dry shallow soil.

Soils are largely alluvial deposits left by shifting river courses. The Narayani and Rapti rivers have markedly influenced the soils of the valley, almost eliminating the original basin deposits. Most dun valley soils reflect the lacustrine and fan-delta characteristics of the watershed draining into the basin during the late Tertiary period. However, Chitwan dun has been much more affected by major river systems. Drainage is variable with the water table ranging seasonally from 0-2m. Older soils on fans, aprons and ancient river terraces are well drained sandy loam to loam. The water table seasonally ranges from 1-15m. Hill soils are sandy loam to loamy rubble, with very stony surfaces less than 50 cm from bedrock. Surface drainage is very rapid, internal drainage is poor, and erosion is severe.

2.4 Land Cover

82% of the park area is covered by forests while the coverage of grassland and water bodies is 5.36% and 3.45 % respectively.

2.5 Topography and drainage

The elevation of the Park ranges from 150m to 815m above mean sea level. The Park is situated in a river valley basin or dun, along the floodplains of the Rapti, Reu and Narayani rivers. The Someswar and the Daunne hills form the southern catchment and both drain into the Narayani river. The Churia hills divide the Park into two faces, their northern face falling within the catchment of the Rapti and southern side forming catchment of the Reu. The Rapti is bordered by the Mahabharat Range on the north. Both Rapti and Reu flow westwards and drain into the Narayani, which flows southwards for about 25 km through a narrow gorge between Someswar and Daunne hills until it reaches Tribeni, the Nepal-India border. The Churia, Someswar and Daunne hills constitute part of Siwaliks which are characterized by outwash deposits carried from the north.

2.6 Rivers and Streams

Narayani, Rapti, and Reu rivers flowing through the Park are the major water sources and considered as lifeline of the Park. Besides, there are several other streams and streamlets fulfilling the requirement of wildlife species in the Park. In addition, these rivers are home to several aquatic animals, including critically endangered Gharial crocodile and Gangetic dolphin.

3. BIODIVERSITY AND HABITAT OF CHITWAN NATIONAL PARK

3.1 Vegetation

The major vegetation composition of the Inner Terai is Sal (*Shorea robusta*) forest, which covers more than 70% of the Park vegetation. However, floods, fires and riverine erosion combine to make continually changing mosaics of grasslands and riverine forests in various stages of succession. Pure stands of Sal forest occur on well drained topography such as the lowlands around Kasara in the centre of the Park. Elsewhere, Sal is intermingled with Chir Pine (*Pinus roxburghii*) along the southern slope of Churia Hills and with tree species such as Harro (*Terminalia chebula*), Satisal (*Dalbergia latifolia*), Banjhi (*Anogeissus latifolia*), Elephant apple (*Dillenia indica*) and Ramsing (*Garuga pinnata*) on northern slopes. Climbers, such as Bhorla (*Bauhinia vahlii*) and Debre lahara (*Spatholabus parviflorus*) are common. The under-storey is scanty with the exception of grasses such as Themada (*Themeda villosa*). Riverine forest and grasslands, which form a mosaic along the river banks, are maintained by seasonal flooding. Khair-Sissoo (*Acacia catechu-Dalbergia sissoo*)

association predominates on recent alluvium deposit during floods and in lowland areas that escape the most serious flooding. Simal-Bhellar (*Bombax ceiba-Trewia nudiflora*), with under-storey shrubs Dahi Kamala (*Callicarpa macrophylla*), Bhati (*Clerodendrum viscosum*) and Amala (*Phyllanthus emblica*), represent a later stage in succession.

In CNP, 16 land cover types: 4 types of Sal (*Shorea robusta*) forest association (lowland Sal, mixed Sal, degraded Sal and hill Sal), 3 types of riverine forest associations (*Trewia-Bombax*, *Acacia-Dalbergia*, and mixed riverine), 2 types of short grassland association (flood plain grassland and short grassland), 3 types of tall grassland association (swampy tall grass, tall grass and wooded tall grass), 2 types of wetlands (rivers and lakes), exposed surface and the cultivated lands have been identified so far.

Themeda villosa forms a tall grass cover in clearings in the Sal forest; *Saccharum-Narenga* associations grow as mixed and pure stands of tall grass, Kans (*Saccharum spontaneum*) is one of the first species to colonize newly created sandbanks); Narkat (*Arundo-Phragmites*) associations form dense tall stands along stream beds on the floodplain and around lakes; Siru (*Imperata cylindrica*) grows prolifically in areas within the Park which were occupied by villages prior to their evacuation in 1964; various short grasses and herbs grown on exposed sand banks during the dry months and become much more prolific with the outset of rain after May (e.g. *Polygonum plebeium*, *Persicaria* spp. and sedges such as *Cyperuskyllinga* and *Mariscus* spp.); Dubo (*Cynadon dactylon*) and Kure ghans (*Chrysopogan aciculatus*) and other short grasses grow in highest areas near riverine forest all the year round; and low-lying stands of Kans (*Saccharum spontaneum*), which are being damaged by repeated flooding early in the monsoon.

3.2 Wildlife

CNP is home to almost 70 species of mammals (Annex II), 49 species of reptiles and amphibians, more than 541 species of birds (Annex III), 120 species of fishes and several species of invertebrates. The Park is especially renowned for Greater One-horned rhinoceros (*Rhinoceros unicornis*), Bengal tiger (*Panthera tigris*) and Gharial crocodile (*Gavialis gangeticus*). The Park harbours not only the largest mammal of Nepal, i.e. Wild Asian elephant (*Elephas maximus*) but also the smallest terrestrial mammal such as Pygmy shrew (*Sorex minutus*). More than 541 species of birds has been recorded so far, including 22 globally threatened species like endangered Bengal florican (*Houbaropsis bengalensis*), Slender-billed vulture (*Gyps tenuirostris*), White-rumped vulture (*Gyps bengalensis*) and Red-headed vulture (*Sarcogyps calvus*). Among the total species of birds recorded in the Park, 120 are wetland

dependent, 80 are winter migrants, 6 are summer migrants, 28 are residential and 6 are vagrant.

The floodplain grasslands and riverine forest are habitat to rhino, spotted deer and hog deer whereas slopes with Sal and mixed forest are supporting Sambar (*Cervus unicolor*), Gaur (*Bos Gaurus*) and Barking deer (*Muntiacus muntjak*). These animals move downwards towards the valley during pinch periods of water scarcity. The flat areas with Sal and mixed forest are the domain of Spotted deer (*Axis axis*), Wild boar (*Sus scrofa*) and Barking deer (*Muntiacus muntjak*) too. The vast grasslands, some of which are relocated village sites are strongholds of rhino and spotted deer, the latter being characteristically present at ecotones formed by woodland-grassland edges. Carnivores are distributed based on prey density and hierarchy of the predator in the food chain but are seen almost all over the Park while Common Leopards occupy fringe habitats in the Park. Similarly, Gharial crocodile (*Gavialis gangeticus*) can be found in less disturbed zone of Rapti and Narayani rivers and river banks whereas Marsh Mugger Crocodile (*Crocodylus palustris*), Python (*Python molurus*), Golden monitor lizard (*Varanus flavescens*) are found commonly in wetlands of the Park including swamps.

Chitwan is exceptionally rich in avifaunal species. This is attributed to the Park's wide range of habitat types and location within the sub-tropical lowlands of Central Nepal where eastern and western species overlap in their distributions. There are several breeding species, including Bengal Florican (*Houbaropsis bengalensis*) and Rufous-necked Laughing-thrush (*Garrulax ruficollis*). Chitwan is very important for winter migratory birds (about 160 species in total), both winter visitors from outside Nepal and many altitudinal migrants which descend to the lowlands outside the breeding season, as well as a valuable staging point for numerous passage migrant species. There are 19 species of snakes recorded in the Park, including King cobra (*Ophiophagus hannah*), Green Pit Viper (*Trimeresurus albolabris*), Common kait (*Bungarus caeruleus*) and Rock python (*Python molurus*). Other notable reptiles are Marsh Mugger Crocodile (*Crocodylus palustris*), Gharial crocodile (*Gavialis gangeticus*), Golden monitor lizard (*Varanus flavescens*) and Indian Starred tortoise (*Geochelone elongate*). Some 120 species of fish have been recorded, including *Barilius* species, *Tor tor*, *Tor putitora* and *Puntius* species. Endemic species, the Maskey's burrowing frog (*Tomopterna maskeyi*) is also found in the Park.

There are several species of invertebrates mainly insects and butterflies recorded so far in the Park that play a major role in pollination of trees as well as a food source for insectivorous birds which feed on various life cycle stages.

4. BUFFER ZONE

Buffer Zone area of Chitwan National Park is extended in 1 metropolitan city (Bharatpur), 8 municipalities (4 from Chitwan and 4 From Nawalpur) and 3 rural municipalities (1 from Parsa, 1 from Makwanpur and 1 from Nawalpur).

There are Twenty two buffer zone user committees in CNP's Buffer Zone. There are seventy-nine buffer zone forest user groups.

The user committees and the user groups will have their own work plans and financial resources channeled through buffer zone management committee to utilize in conservation, community development, income generation, and skill enhancement and conservation education program. The park and the local people jointly initiate community development activities and manage natural resources in the buffer zone. Government of Nepal has made provision of to provide 30-50 percent of the park revenue for community development and natural resource management in the buffer zone.

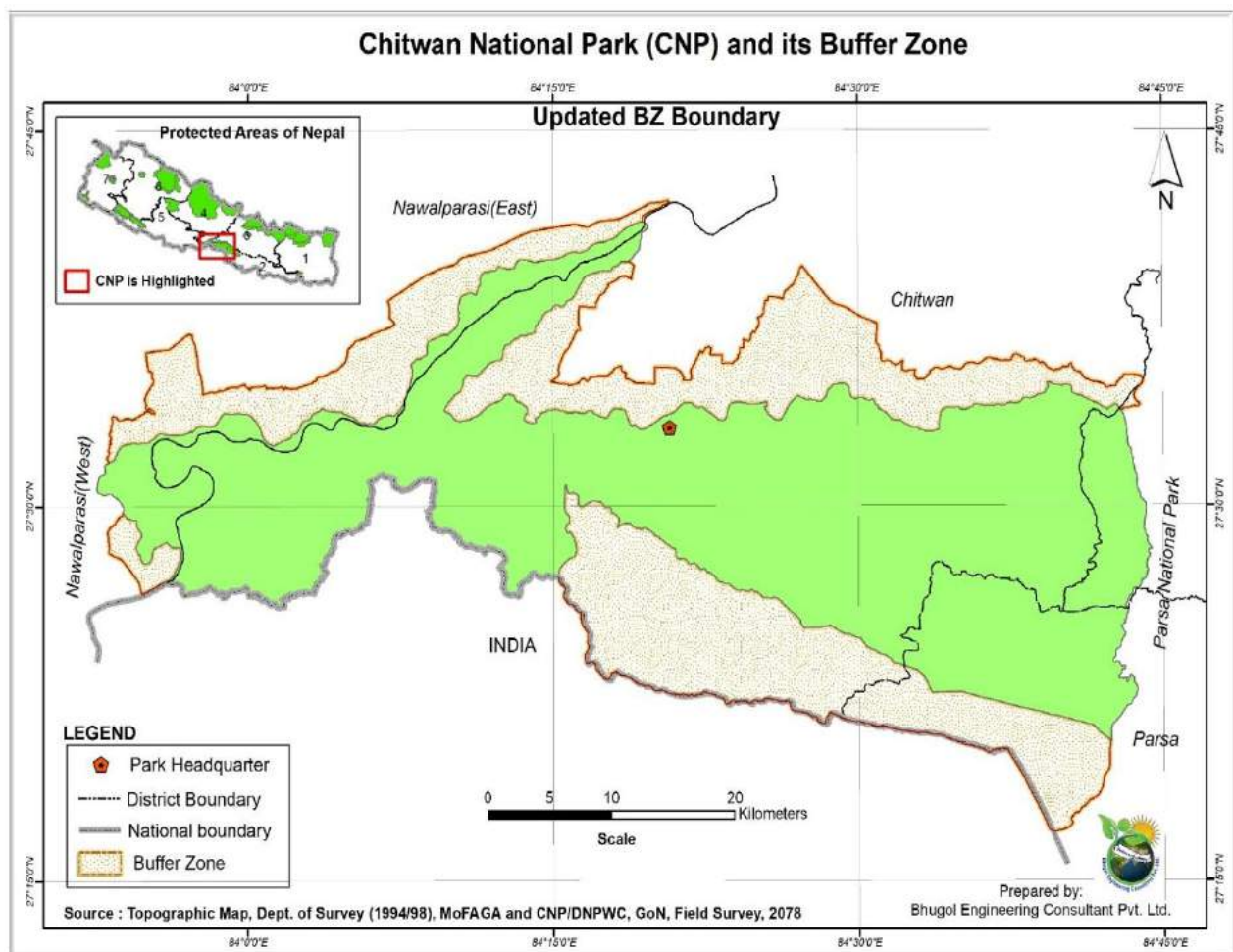


Figure 2: Chitwan National Park and Its Buffer Zone

5. OBJECTIVES

General Objective:

The general objective of this study is to explore extent and mapping of existing habitat management activities and physical infrastructures using GPS/ GIS in Chitwan National Park.

Specific objective:

- To review annual reports of the conservation techniques and management implications of CNP.
- To consult with park staff for mapping of watch tower, grassland, waterholes, fire line, forest road/Paths etc. located within park for survey.
- To survey physical infrastructures within park and recommend gaps in habitat management activities including identification of most probable tourism activities.
- To assess the habitat management activities by mapping.

6. RESULTS

6.1 WATERHOLES

In general terms, waterholes refer to a geological depression in which water collects. More specifically, it is an area that is regularly drunk from by animals. Wildlife water holes are an important habitat component for a variety of wildlife. They provide drinking water for many species and also serves as breeding habitat for many amphibians. They are central points for animals in the dry season and play a vital role in regulating animal behaviour as well as functioning of ecosystems. Due to the diverse applicability of waterholes in wildlife conservation, National Parks have been continuously emphasizing on construction and management of artificial as well as natural waterholes present throughout the park complex. Most of the natural waterholes are covered with invasive species as well as get siltation which needs regular maintenance and sanitation. In CNP, some of the areas are dry where waterholes become dry during summer. In such area artificial pond have been constructed with installation of solar boring for the regular supply of water for wildlife. Wildlife in the dry areasof park utilizes effectively the water from natural and artificial waterholes present in the park. Artificial waterholes help alleviate the effects of water shortage in the rivers. Apart from this, theprovision of artificial water holes also helps lessen the over-use of, and the environmental degradation around the natural water holes and springs and hence enable the ecosystem to degrade less in the dry season.



Figure 3: Lamital



Figure 4 : Kavre Tal

CNP has three major river system i.e. Narayani, Rapti and Reu that confluence at western sector of CNP. The total number of artificial as well as natural waterholes present throughout the park complex with its actual location in XY Coordinate is given in annex 1.

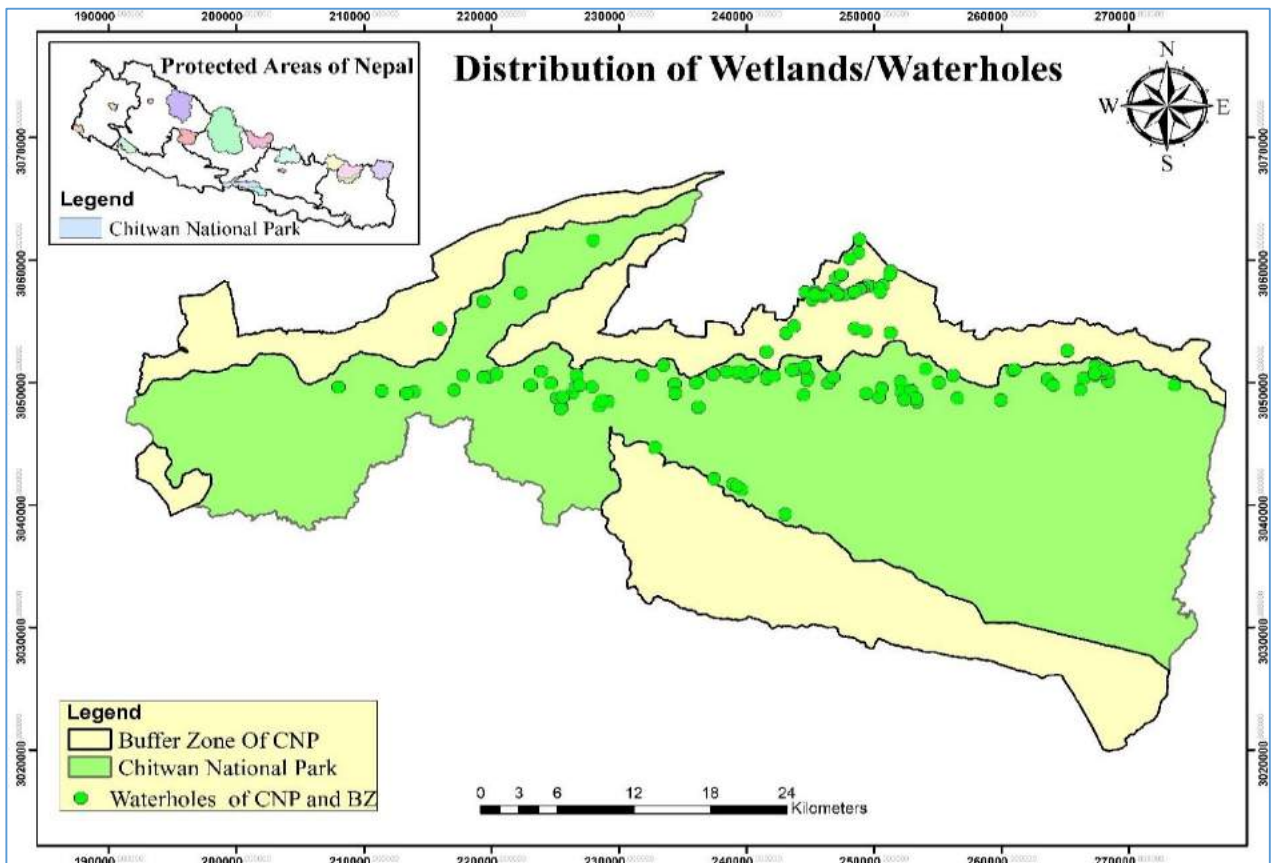


Figure 5: Location of waterholes in CNP and Its Buffer Zone Area

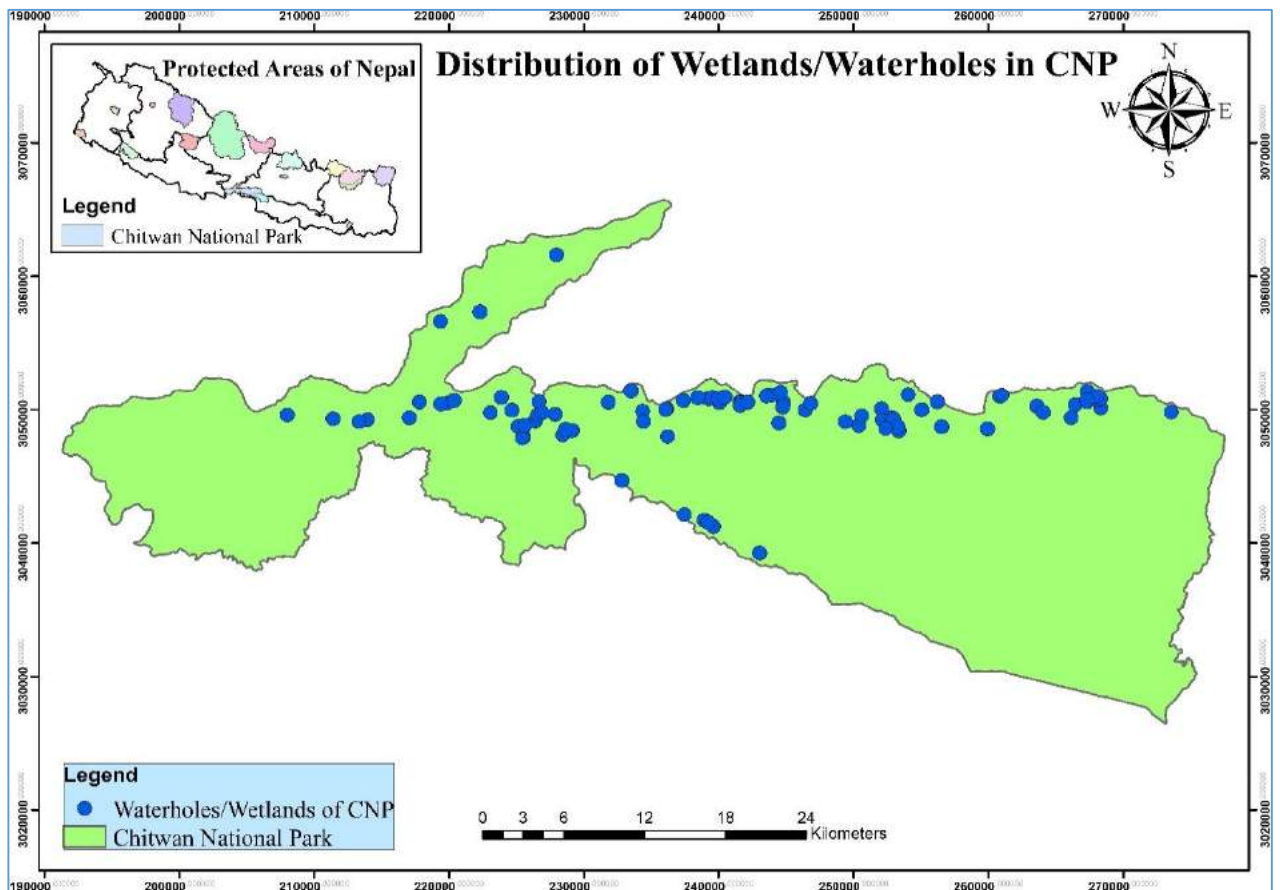


Figure 5: Location of waterholes in CNP and Its Buffer Zone Area

6.2 GRASSLAND

Grasslands are found in most eco-regions of the Earth. They represent potential natural vegetation which is predominantly grasses (members of the family Gramineae excluding bamboos), grass-like plants, and forbs. The regions where climatic and edaphic factors prohibit the growth of trees and tend to stimulate grassland formation. Grassland ecosystems can support high densities of grazing animals. They are home to many familiar and fascinating species that live in herds, including rodents and antelopes, and the predators that prey on them, like tiger and cheetahs. Grassland provides true shelter, feeding and ambushing environment for wild animals. Due to this reasons presence of grassland really matters for biodiversity conservation.

The climax vegetation of the Inner Terai is Sal (*Shorea robusta*) forest, which covers some 70% of the CNP. Grasslands of CNP are classed as disturbance dis-climaxes, an outcome of indiscriminate fire and livestock grazing, or secondarily as edaphic climaxes. More than 50 grass species are found here including elephant grass (*Saccharum ravennae*), Giant cane (*Arundo donax*), Khagra reed (*Phragmites karka*) and several species of true grasses. Siru grass (*Imperata cylindrica*) and Kans (*Saccharum spontaneum*) are the dominant grass species in short grasslands which are being invaded by other coarser grass species as well as woody

species. Siru has the highest competitive capacity among the herbs and other invaders as seedlings of trees and shrubs in the grassland ecosystem.

Expansion of invasive species like Mikania and other unwanted species are increasing significantly in important grasslands resulting in shrinkage of grassland area. Wildfires, illegal grass cutting and seasonal floods are the major issues and threats in the grassland management. To address these issues and threats, assurance of up-to-date database of grasslands about park management intervention and its impact information is vital. Periodic mapping of grasslands with updated information will help park authority for detailed planning and resource management which ultimately creates grasslands a better habitat for wildlife.

To meet the grassland demand of the wildlife, park management have converted large area of forest land into grassland and the data concerned with grassland in Chitwan National Park is shown below in the map denoted by green symbolization. The details of grasslands along with its GPS location given in Annex 2.



Figure 6: Gaur Machan Phanta



Figure 7: Bhimle Phanta

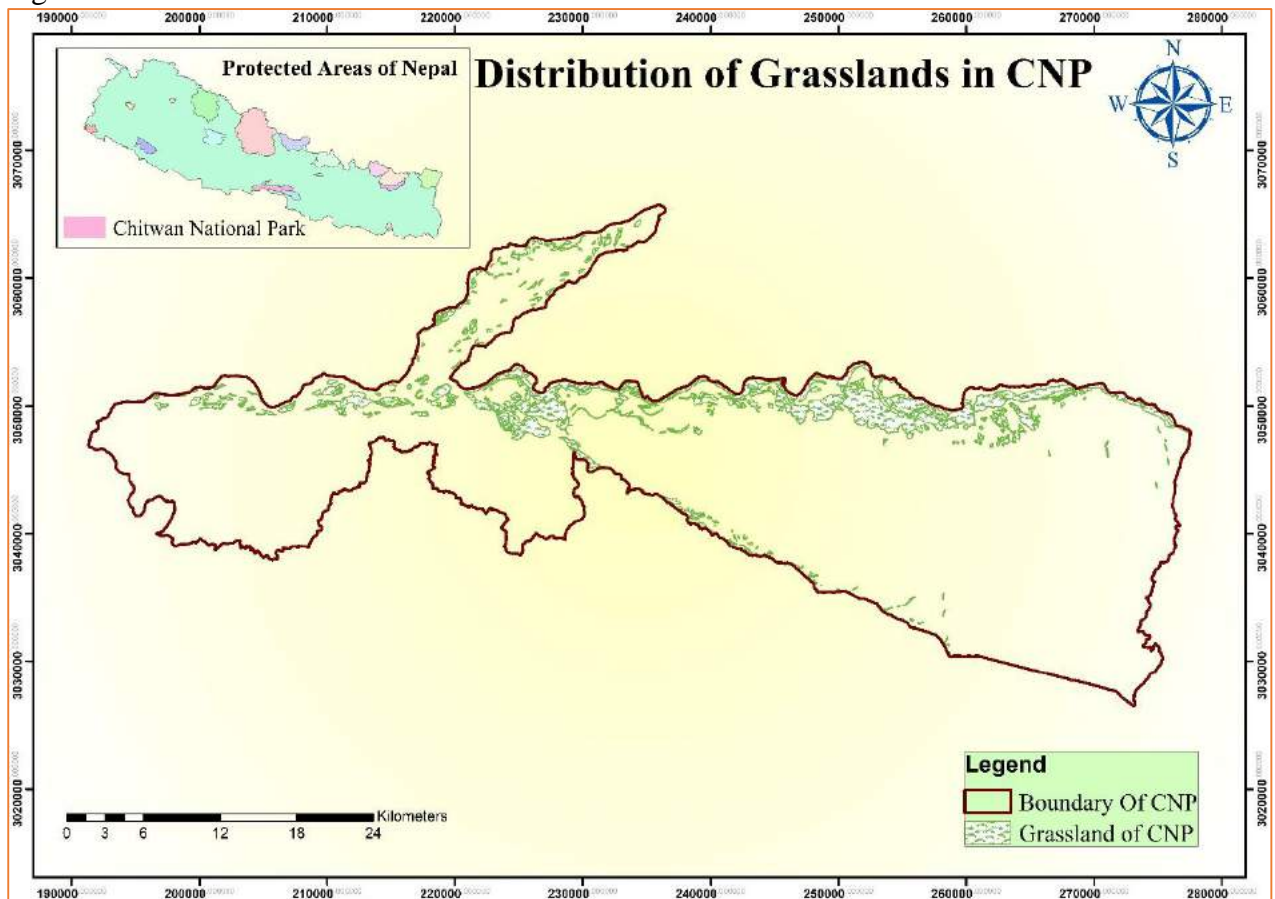


Figure 8: Distribution of Grasslands in CNP

6.3 WATCH TOWER

Machans (watchtowers) are the structures which provide a vantage point to observe any place. Generally, these tower help explore the scenic beauty of a landscape to tourists who visit the location. In protected areas these towers also serve the roosting purpose to performing long ranger patrol and overnight patrols. Besides that, it is equally important for observing wildlife movement

and their activities. On several occasions, total 41 watchtowers are constructed in the national park which are almost proportionately distributed in the park. Based on the building material, there are two types i.e., wooden and concrete as shown in the figure 10 and 11. The details of view tower (Mchan) is given in annex 3.



Figure 9: Bhimle Machan



Figure 10: Wooden Machan



Figure 11:Harda Khola Roto mate Machan

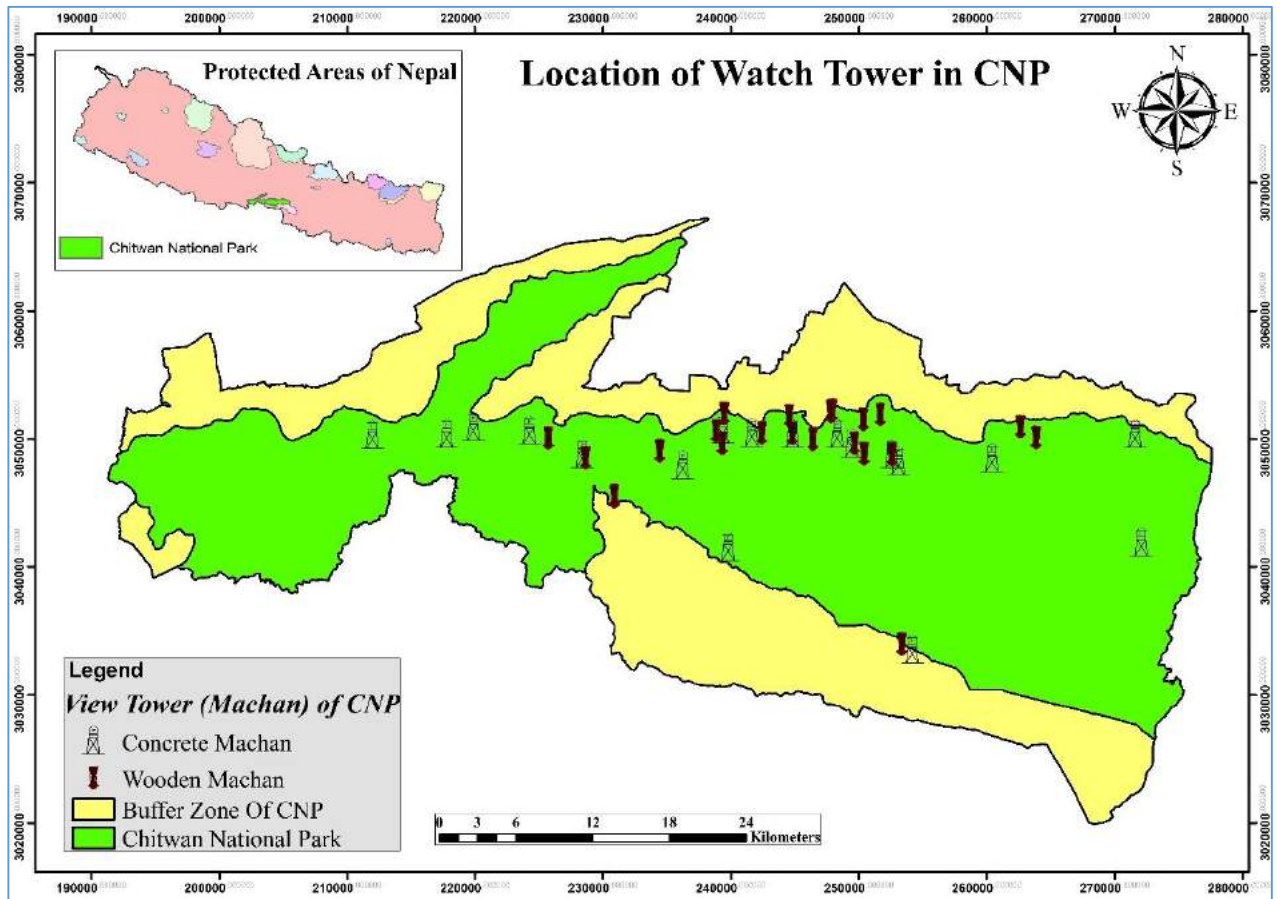


Figure 12: Location of View Tower

6.4 ADMINISTRATIVE DIVISION

The Park headquarter is situated at Kasara, Chitwan district. Further the park is divided into Four Sector viz., Sauraha Sector, Kasara Sector, Amaltari Sector and Bagaimadi Sector for sound operation of conservation and administrative purposes. Administrative units operate under the command of headquarters headed by Chief Conservation Officer (CCO). Further, the park area is divided into sector offices headed by Assistant Conservation Officer (ACO) which oversee ranger post headed by Ranger, elephant captivity, and posts headed by senior game scouts. According to O & M of the Park, there are Four Sectors, Ten Range Posts and Twenty-four Posts. Similarly, there is one Elephant Breeding and one Gharial Breeding Centre at Khorsor and Kasara respectively. There are 17 elephant captive posts.

The core area is surrounded from all the sides by the different posts. The main task of different posts is law enforcement and addressing the needs and issues of peripheral impact zone. The details regarding the location of posts is given in annex 4.

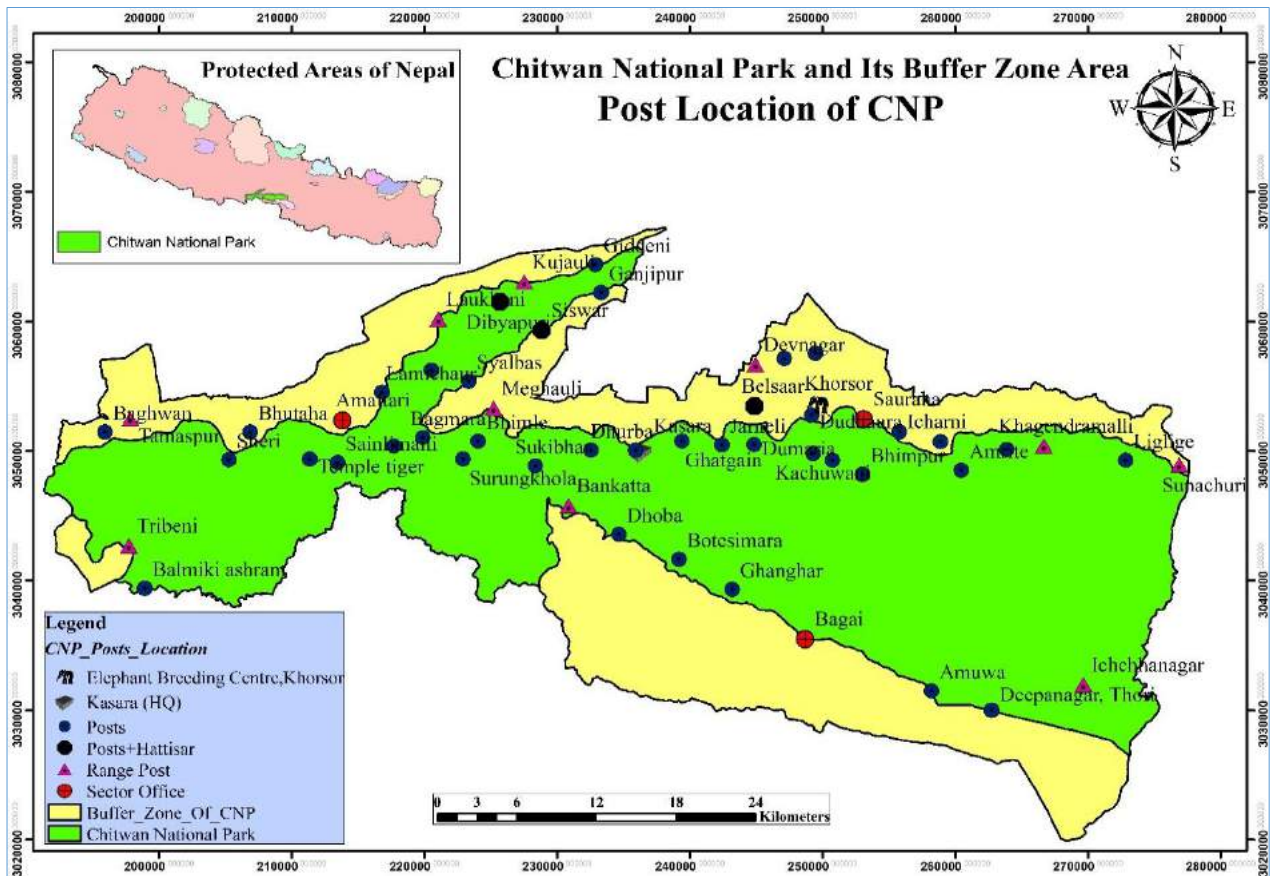


Figure 13: Post Location

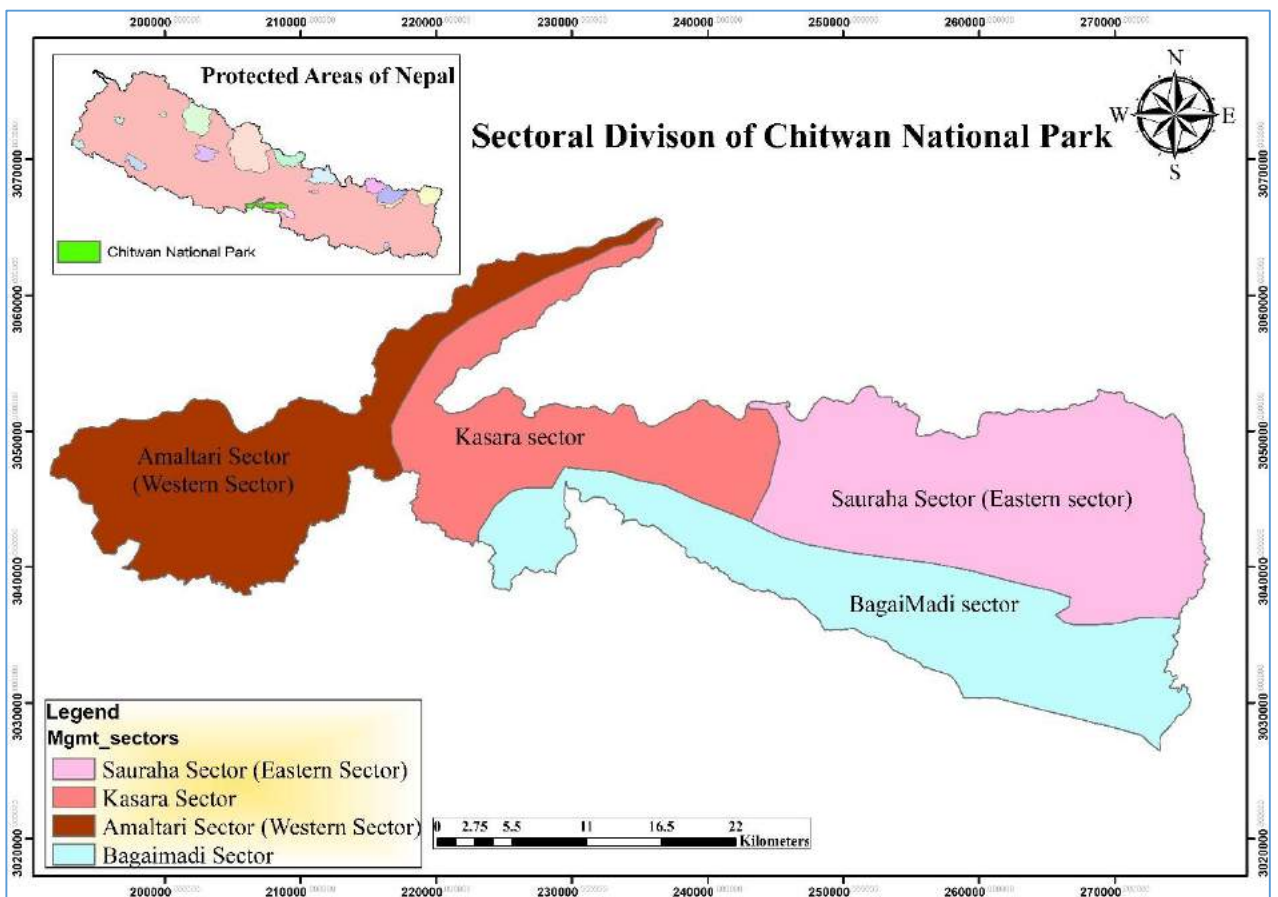


Figure 14: Sectoral Division of Park

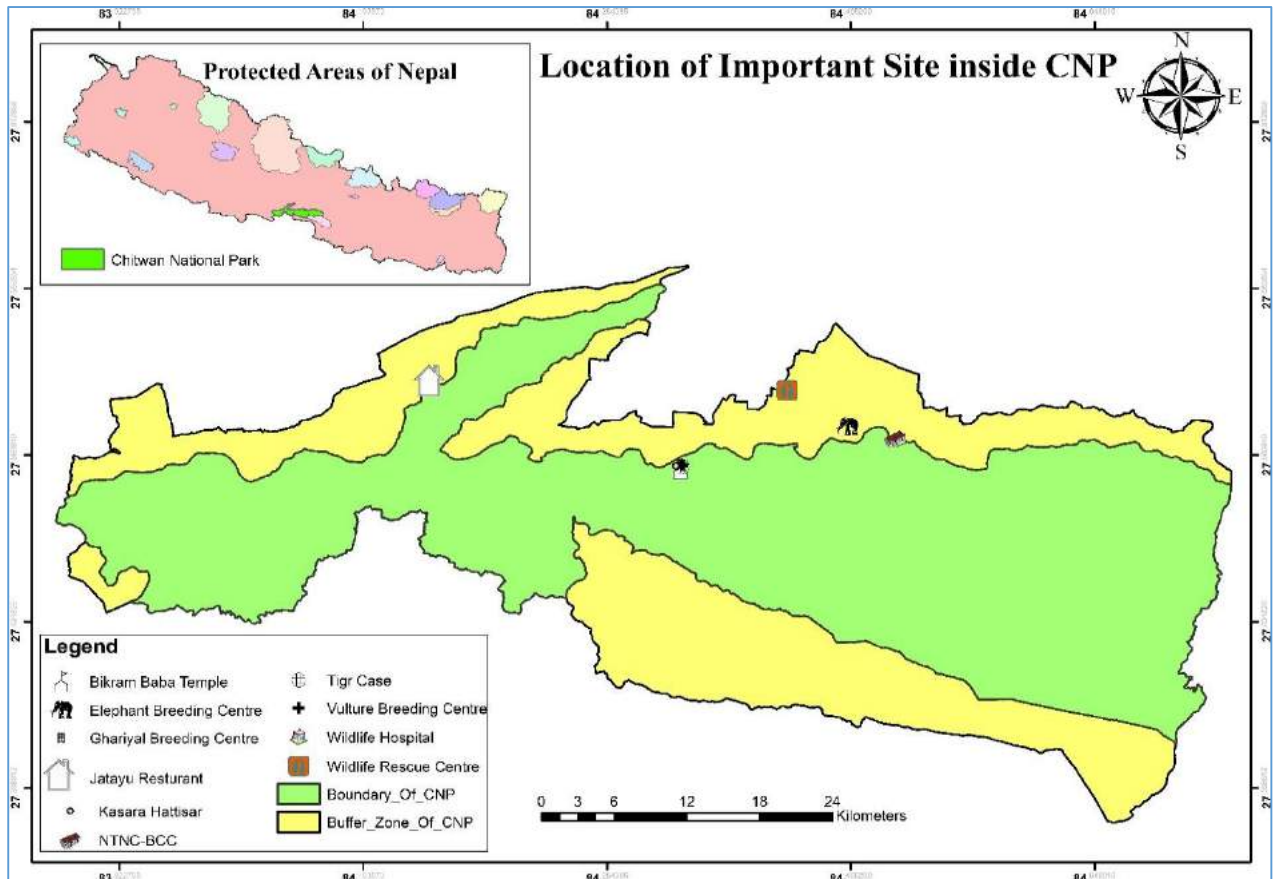


Figure 15: Location of Important Site

6.5 FOREST ROAD AND FIRELINE

The Forest Road has been constructed and developed for the purpose of Tourism (Jungle Safari) as well for regular patrolling and monitoring of wildlife. Similarly, the park is covered by several network of Fire line to prevent the spreading of forest fire during summer season. Based on their extent, the fire line is divided into main fire line (forest road) which extends from east to west of the NP and subsidiary fire lines which connects places with main fire line.

They serve as an important tool for effective patrolling and means for tourism activities. A jungle Safari can be operated in such fire line and forest road. Network of fire line is most important for law enforcement for wildlife conservation and management.

The fire line remains closed for more than 4 months because of flash flood, and muddy tracks due to rain and wind thrown trees. To keep fire line operable throughout the year, culverts/small bridges, gabion boxes should be constructed in the stream crossing and tracks should be surfaced with gravel.

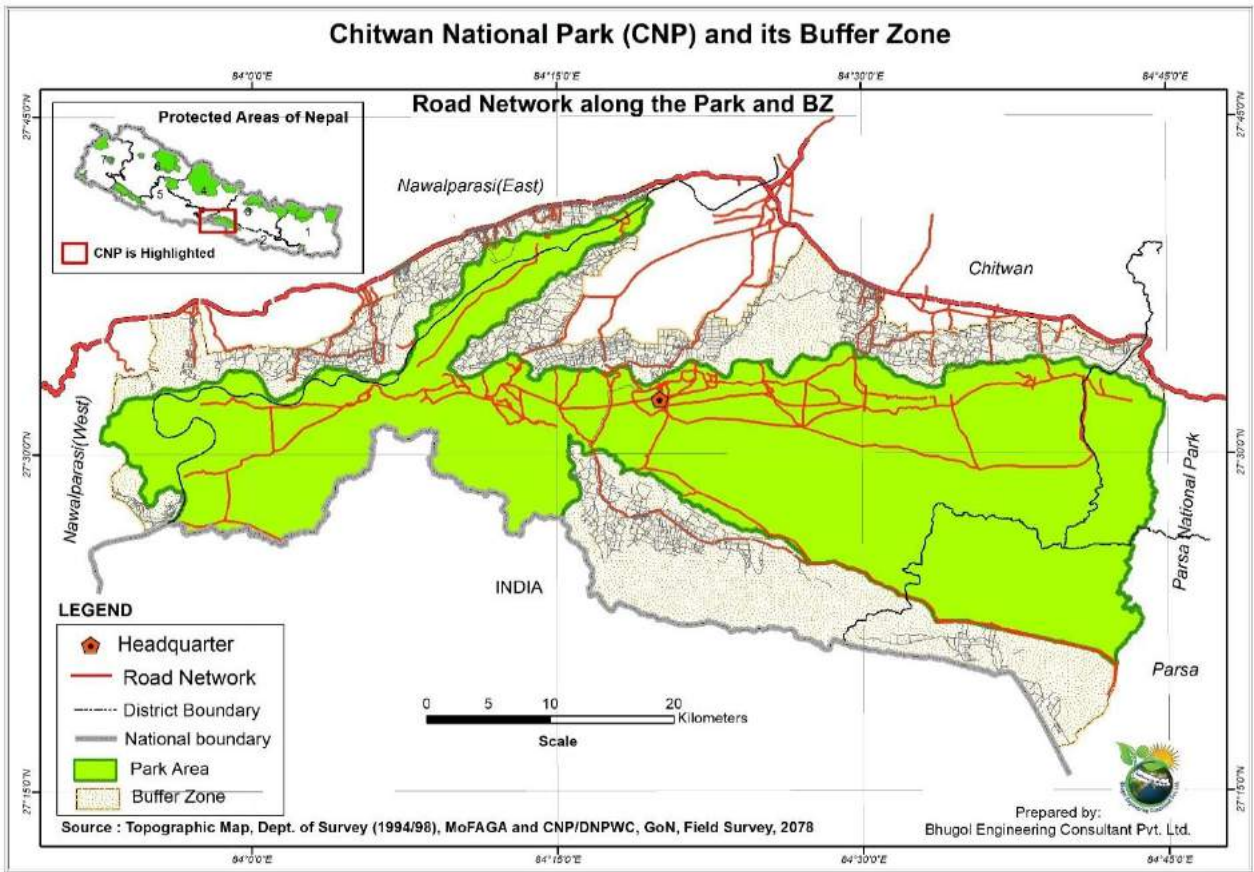


Figure 16: Road Network along the Park and BZ

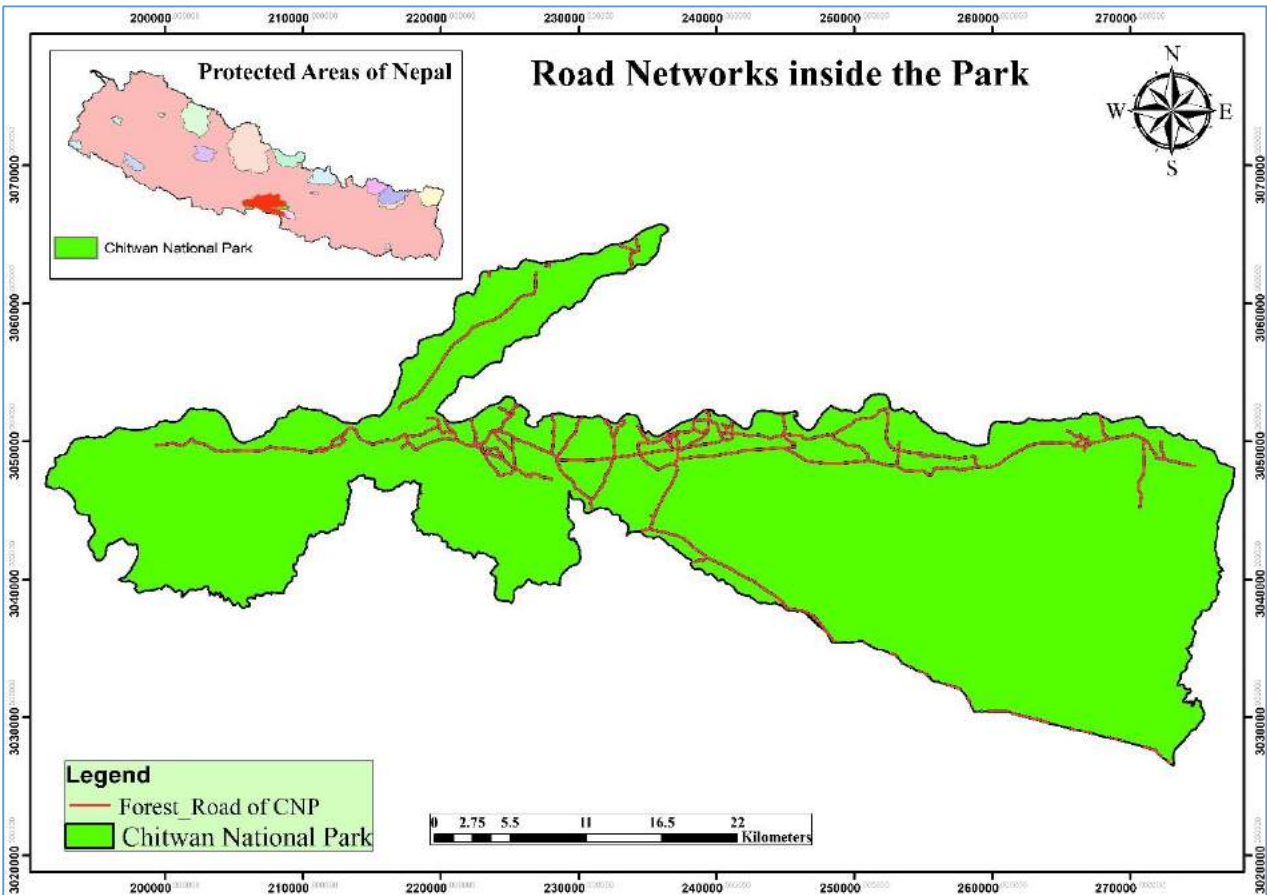


Figure 17: Road Network inside the Park

6.6 BRIDGE/CULVERT

Bridge and culvert are generally a tunnel-like structure that allows water to pass under a roadway. Bridge and culvert possess equally important roles in wildlife conservation and habitat management. Bridge and culverts facilitate in proper movement of wildlife around their habitat. Taking this fact into consideration, Chitwan National Park has constructed number of bridge and culverts in and around the park complex.

Since the park drained by seasonal streams originating from the Chure hills, total 40 bridges and culverts are constructed to span the crossing. These structures are susceptible to damage by annual flash flood therefore regular maintenance of these structure is undertaken by the park. Annex 5 lists the bridges and culverts built in Chitwan National Park along with its location and is represented in the map figure 18.

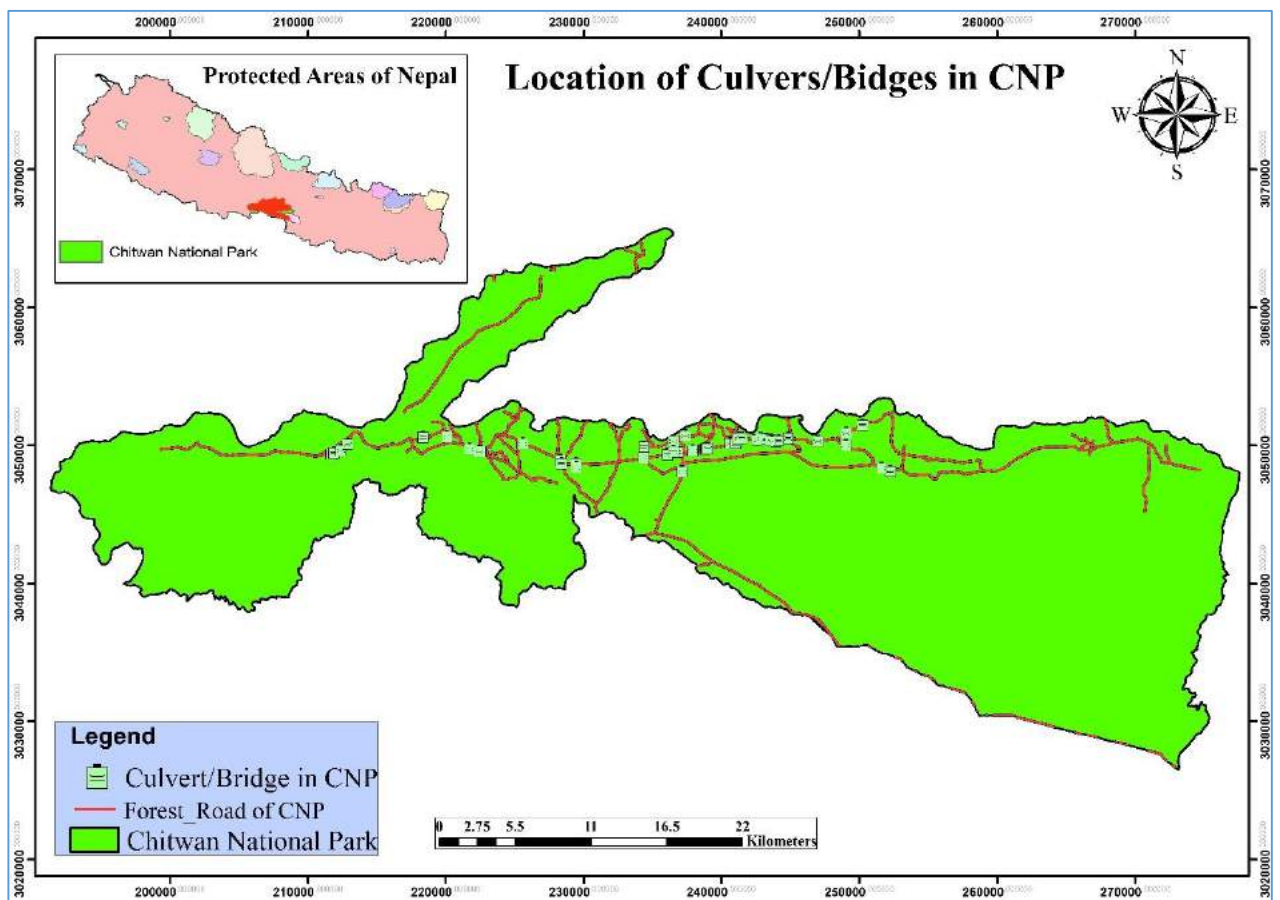


Figure 18: Location of Culverts/Bridges

6.7 SETTLEMENT

Before establishment of National Park, people had easy access to forest resources and the forests were heavily degraded. The record shows that there were several temporary and permanent settlements in the forest. After the park was formed, these communities, with their consent, were relocated from park core area to periphery. Now, more than 358 settlements are present in the buffer zone where whole madi municipality lies inside the CNP's Buffer Zone. Some major settlements are Madi Municipality, Bharatpur Metropolitan, Amaltari, Tamaspur, Triveni etc.

Table 7 lists the settlements and figure 17 shows the Map of settlements in the park.

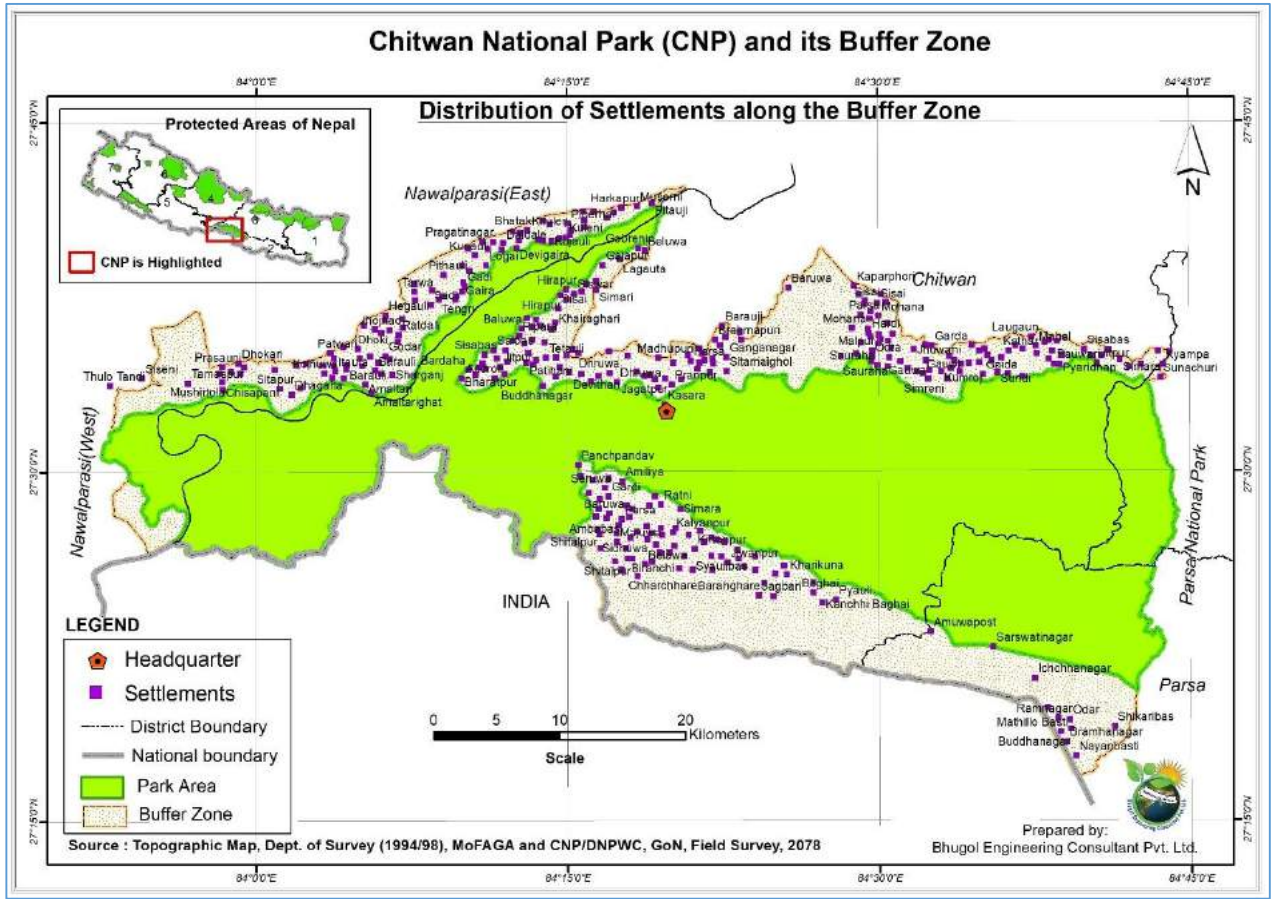


Figure 19: Location of Settlements along the Buffer Zone

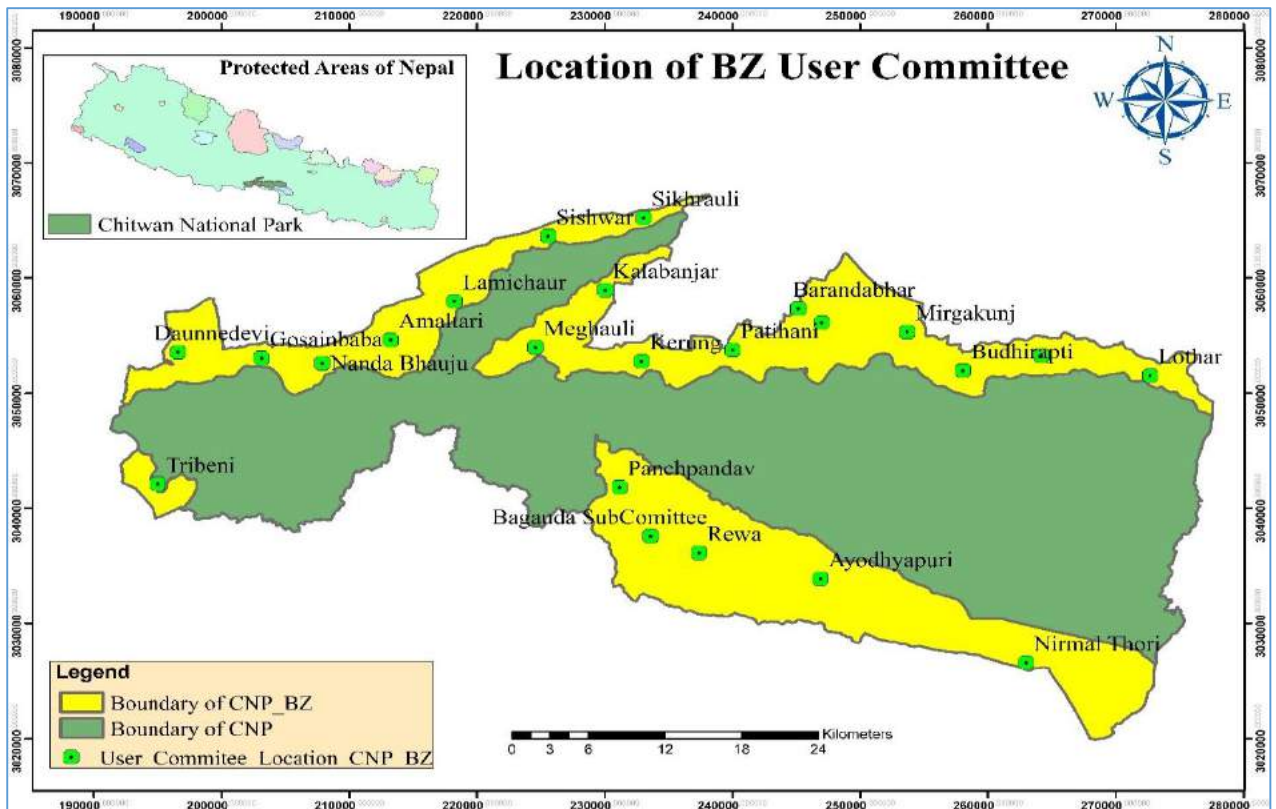


Figure 20: Location of User Committee of CNP's BZ

6.8 PARK ENTRY POINTS

There are eleven entry points (Posts) from where tourists can get entry inside the park. The details of entry points are listed in annex 8.

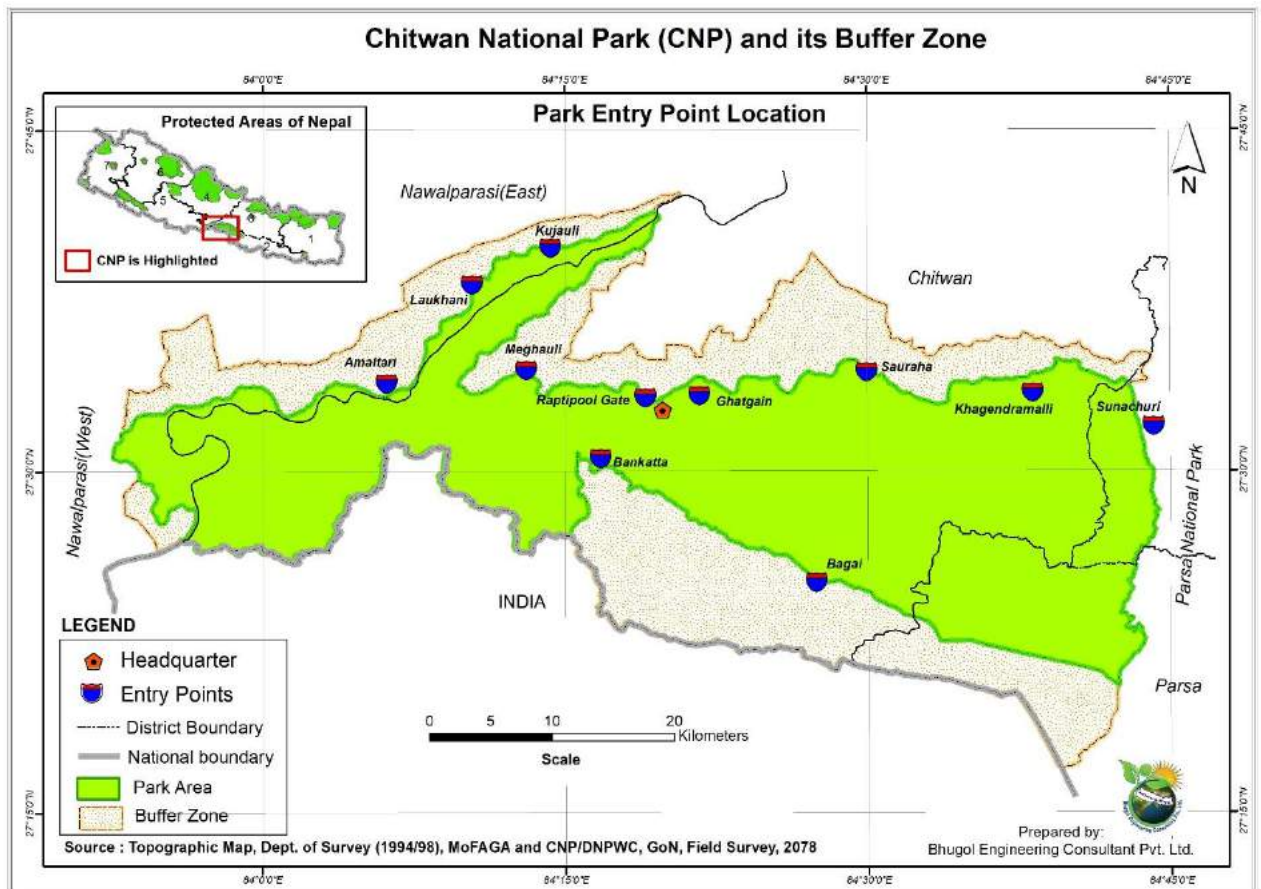


Figure 21: Park Entry Point Location

6.9 SOLAR BORING INSTALLATION

Solar boring has been installed in dry area of the park for easy supply of drinking water for wildlife. Solar boring has been constructed near the pond so that water will be available for wildlife even during dry season. The details of solar boring installation with GPS points is given in annex 9.

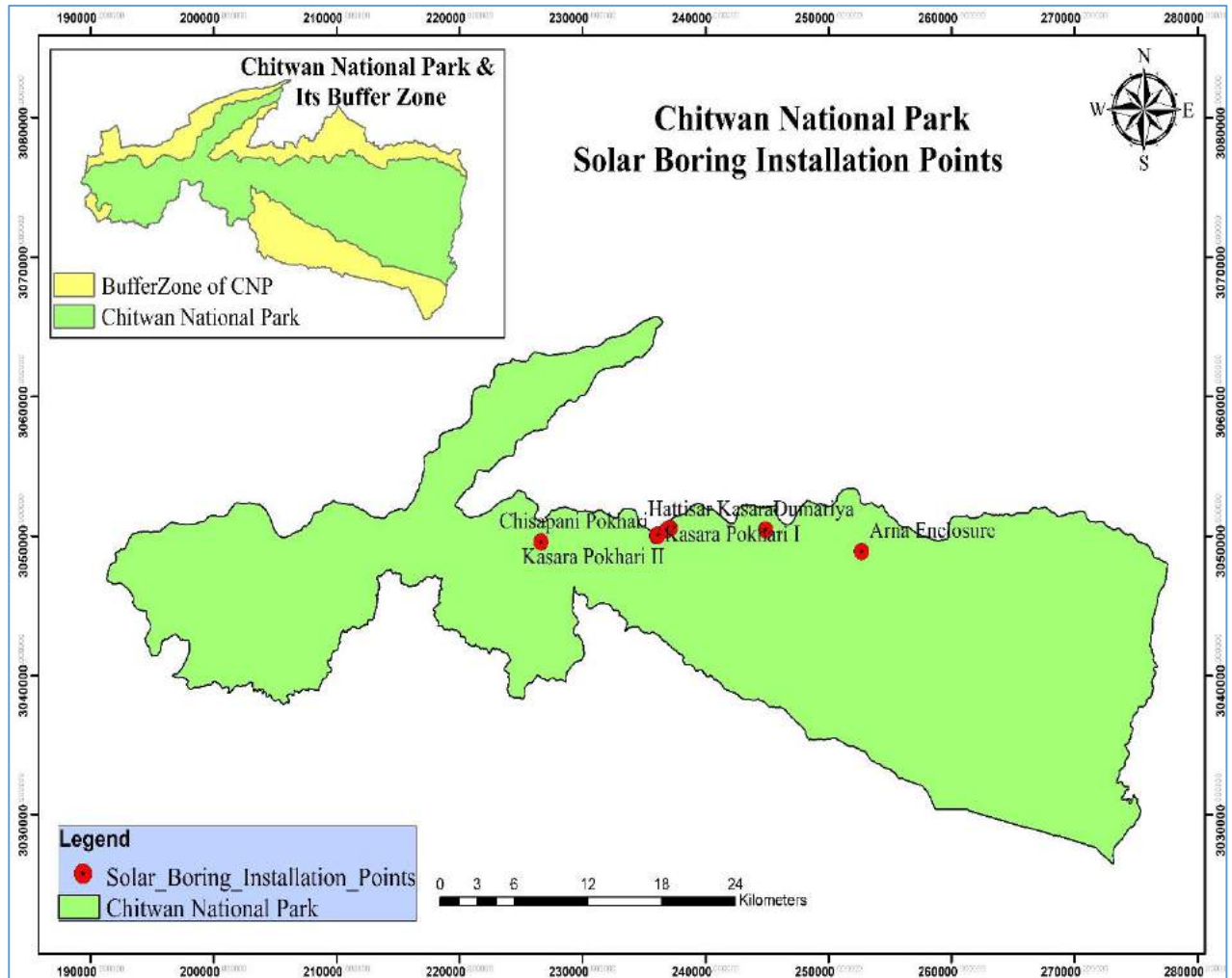


Figure 22: Location of Solar Boring Installation

7. MANAGEMENT THREATS

- Insufficient grassland and wetlands which is degraded due to anthropogenic activities.
- Natural succession that has converted grasslands in to woodlands.
- The physical infrastructures are unevenly distributed.
- During dry and windy season, fire spreads very quickly due to dried grass, fallen leaves and branches which is severe management issue.
- Lack of all- weather road or fire line inside the park.

Exploitation of sand and gravel has been an issue of the park for sustainable management.

8. RECOMMENDATIONS

- The grassland needs to be improved by using appropriate scientific procedures for canopy opening and sound management.
- Installation of solar deep boring system to recharge water holes.
- Network of all-weather road or fire line should be established for sound conservation.
- Improvement in infrastructure for mobility and accommodation in the park areas in all seasons.
- Foot trails needs to be constructed in the chure area of CNP for easy access of patrolling and monitoring.
- Networking and collaboration with respective trans-boundary PAs to monitor and manage migratory mega fauna species such as tigers and wild elephants.
- Periodic repair, maintenance and upgrading of PAs posts, watch tower, bridge/culvert and foot trails.

9. ANNEX

Annex 1: List of waterholes/wetland of CNP

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
1	Batuli Pokhari	Barandabhar	Permanent lake	Temporary wet meadow and lake formed after dam construction by CF)	243099	3054037	
2	Bet-ghari Tal	Barandabhar	Lake	Wet meadow, developed as lake	248795	3060595	
3	Bishazar Tal	Barandabhar	Lake	Lake (formed after the construction of Khageri irrigation canal)	247084	3057398	
4	Bishazari Tal c-1	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	250684	3057926	
5	Bishazari Tal c-10	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	248242	3057321	
6	Bishazari Tal c-11	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	247659	3057131	
7	Bishazari Tal c-12	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	247180	3057168	
8	Bishazari Tal c-13	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	247130	3057168	
9	Bishazari Tal c-14	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	246600	3057589	
10	Bishazari Tal c-15	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	244600	3057378	
11	Bishazari Tal c-16	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	246069	3057050	
12	Bishazari Tal c-17	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	245843	3057124	
13	Bishazari Tal c-18	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	245623	3057091	
14	Bishazari Tal c-19	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	245151	3056745	
15	Bishazari Tal c-2	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	250342	3057715	
16	Bishazari Tal c-3	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	249679	3057825	
17	Bishazari Tal c-4	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	249439	3057908	
18	Bishazari Tal c-5	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	249088	3057746	

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
19	Bishazari Tal c-6	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	248933	3057653	
20	Bishazari Tal c-7	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	248878	3057611	
21	Bishazari Tal c-8	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	248628	3057494	
22	Bishazari Tal c-9	Barandabhar	Temporary wet meadow	Permanent wet meadow (oxbow origin)	248464	3057392	
23	Bob Tal	Barandabhar	Permanent lake	Wet meadow, handed over to BCF, developed as lake by CF	248476	3054426	
24	Bob Tal-1	Barandabhar	Temporary wet meadow	Permanent wet meadow(oxbow origin)	249305	3054216	
25	Budhi Rapti Ghol	Bhimle	Ghol	Ghol	224655	3049947	
26	Century Ghol	Lamichaur	Permanent marshy ghol	Permanent water ghol(oxbow origin)	219367	3056609	
27	Chandi Tal	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	243727	3054595	
28	Chaparchuli Ghol	Chaparchuli	Wet grassland	Ghol	263596	3050263	
29	Chepan Tal	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	251313	3059096	
30	CJL Ghol	Khagendra Mali	Wet meadow	Permanent Ghol	266443	3050358	
31	Devi Tal	Khoriyamuhan	Lake	Lake	217057	3049389	
32	Dumre Ghol	Dumarya	Ghol	Ghol	243568	3051046	
33	Gaindakhasa Ghol	Gaindakhasa	Waterhole	Bigger Ghol	208000	3049595	
34	Gaur Machan Ghol	Charahara	Wet meadow	Permanent Ghol	246413	3049977	
35	Harabansa Ghol	West of Sukhibhar	Permanent marshy Ghol	Permanent marshy Ghol	226664	3050590	
36	Icharni complex-1	Icharni	Wet meadow	Permanent Ghol	255059	3049988	
37	Icharni complex-2	Icharni	Wet meadow	Permanent Ghol	254043	3051121	
38	Jamuna Ghol	Bandajhula	Narayani Bhan- galo	Water Ghol	227964	3061600	
39	Kabre tal	Bagmara, west of Tiger Top	Lake	Lake	219815	3050461	
40	Kalimati Tal	Barandabhar	Lake	Temporary wet meadow handed	248091	3060106	

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
				over to BCF, develop as permanent lake			
41	Kamal Tal	East of Sukibhar	Permanent lake	Permanent lake (oxbow origin)	229141	3048438	
42	Kamero Matchan Ghol	Lamichaur	Ghol	Temporary wet meadow handed over to BCF, develop as permanent Ghol	215943	3054368	
43	Khagendra Malli Ghol	Khagendra Mali	Water Ghol	Water Ghol	267326	3051359	
44	Kharkatta Ghol	East of Surung Khola	Permanent marshy Ghol	Permanent marshy Ghol	225526	3047964	
45	Kingfisher - 1	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	245350	3057440	
46	Kingfisher - 2	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	245341	3057254	
47	Kingfisher - 3	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	245354	3057166	
48	Kuchkuche ghol	Kathar	Flowing stream	Flowing Ghol	265151	3052583	
49	Kumal Tal	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	250474	3057362	
50	Kumrose	Kumrose	Swampy Ghol	Permanent Ghol	256213	3050584	
51	Laguna Tal	West of Jarnali post	Tal	Water Ghol	241754	3050530	
52	Lami Tal	West of Ghatgain Post	Tal	Permanent lake (oxbow origin)	239236	3050813	
53	Lamotal	west of Baghmara	Tal	Permanent lake (oxbow origin)	219367	3050423	
54	Liglige Ghol	North of Liglige Post	Waterhole	Water Ghol	273550	3049804	
55	Majur Ghol	Charahara	Not found	Water Ghol	246821	3050460	
56	Mardi Ghol	Bandarjhula Island	Water Ghol	Water Ghol	222297	3057325	
57	Martchauli Ghol	Old Padampur	Wet meadow	Water Ghol	252068	3050068	
58	Martchauli Marsh	Old Padampur	Marshy land	Water Ghol	252134	3049228	
59	Mayur Tal	Barandabhar	Lake	Temporary wet meadow handed over to BCF,	248856	3061685	

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
				develop as permanent lake			
60	Munda Tal	Bagmara	Lake	Permanent lake (oxbow origin)	220381	3050689	
61	Mushar Tal	Bagmara BCF	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	251297	3054061	
62	Nanda Bhauju Tal	Bhimle	Lake	Permanent lake (oxbow origin)	223878	3050910	
63	Nandan Tal	Bhawanipur	Lake	Permanent lake (oxbow origin)	250392	3048812	
64	Neure Tal	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	247029	3058551	
65	Niure/Chisa pani Ghol	West of Kasara	Seasonal Ghol in rainy	Permanent Ghol	234352	3049881	
66	Patana/Garud Tal	Old Padampur	Marsh Lake	Wet meadow, develop permanent marsh lake through water divert from Patana Khola	252823	3049417	
67	Rapti Ghol	Jagatpur	Permanent Ghol	Rapti Bhangalo, develop as ghol through Rapti divert	233491	3051399	
68	Rapti Lok Tal 1	Kathar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	260828	3050996	
69	Rapti Lok Tal 2	Kathar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	260992	3051059	
70	Ratomate Tal	Barandabhar	Lake	Temporary wet meadow handed over to BCF, develop as permanent lake	247441	3058807	
71	Sapanwoti Ghol	Amaliya	Permanent Ghol	Water Ghol	232818	3044687	
72	Sera Tal	Dhurba	Permanent Lake	Permanent lake (oxbow origin)	231816	3050560	
73	Simara Ghol	Boate Simara	Permanent Ghol	Permanent Ghol	237443	3042130	
74	Singe Tal	Bagmara	Wet meadow	Permanent tal	217803	3050560	
75	Singe Tal	West of Kho-rea Muhan	Wet meadow	Permanent Lake	213944	3049250	
76	Sitamain Ghol	Patihani	Lake	Temporary wet meadow, BCF develops as permanent lake	241562	3052512	

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
77	Suksuke Ghol	Sukhibhar	Permanent Ghol	Permanent Ghol	226383	3049138	
78	Tamor Tal	Tamo Tal	Permanent lake	Permanent lake	236210	3047984	
79	Temple Ghol	Temple tiger	Permanent marshy Ghol	Permanent Ghol	211406	3049306	
80	Temple Ghol-2	West of Sali- Mailie Khola	Permanent marshy Ghol	Permanent Ghol	213336	3049105	
81	Thapaliya Tal	West of Kasara	Seasonal tal	Wet grassland, develop as tal	234407	3049103	
82	Thotari Tal	South of Sukhibhar	Permanent lake	Permanent lake (oxbow origin)	228442	3048104	
83	Tikauli Tal	Barandabhar	Lake	Wet meadow, handed over to CF in 2007 & developed as lake by CF	251226	3058789	
84							
85	Sukhibhar Ghol (Kamal tal Siran)	Sukhibhar	Natural ghol	Natural-Kamaltal ko Siran	228642	3048521	
86	Thapmaya Tal	Sukhibhar	Artificial Construction	Artificial Construction	227869	3049643	
87	CC Camera Tal	Kasara, Hattisar	Artificial Construction	Artificial Construction	237379	3050680	
88	Ghatgain Tal (Lamital ko Purano siran)	Ghatgain	Artificial Construction	Artificial Construction	239530	3050914	
89	Laguna Phanta Tal (I)	Jarneli	Artificial Construction	Artificial Construction	241580	3050563	
90	Laguna Phanta Tal (II)	Jarneli	Artificial Construction	Artificial Construction	241676	3050543	
91	Dumariya Sano Ghol	Dumarya	Artificial Construction	Artificial Construction	243927	3051084	
92	Dumariya Pul Ghol	Dumarya	Natural ghol	Natural ghol/Dumre ghol-Outlet	244825	3050507	
93	Dumariya Phanta Ghol	Dumarya	Artificial Construction	Artificial Construction	244758	3050191	
94	Harda Pokhari	Liglige	Artificial Construction	Artificial Construction	268333	3050128	
95	Khagendram alli Pokhari I	Pyaridhap	Artificial Construction	Artificial Construction	267315	3050589	
96	Khagendram alli Pokhari II	Pyaridhap	Artificial Construction	Artificial Construction	266145	3049401	
97	Cijel Pond I	Pyaridhap	Artificial Construction	Artificial Construction	268009	3050753	
98	Cijel Pond II	Pyaridhap	Artificial Construction	Artificial Construction	264060	3049792	
99	Chaparchuli Pond	Amrite	Artificial Construction	Artificial Construction	268003	3050744	

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
100	Amrite Pokhari	Amrite	Artificial Construction	Artificial Construction	259938	3048560	
101	Bhimpur Phanta Pond	Sauraha	Artificial Construction	Artificial Construction	253354	3048413	
102	Hattikhet Pokhari	Sauraha	Artificial Construction	Artificial Construction	256534	3048712	
103	Jarneli Ghol	Jarneli	Natural ghol	Natural	243540	3051023	
104	Tented Camp Complex I	Kachhuwani	Marshy Swamp		249389	3049094	
105	Kachhuwani Ghol	Kachhuwani	Marshy Swamp		250604	3049538	
106	Bhulai Ghol	Khagendram alli	Artificial Construction		268316	3050826	
107	Chilaune Ghol Complex I	Khagendram alli	Marshy Swamp		268014	3051016	
108	Chilaune Ghol Complex II	Khagendram alli	Marshy Swamp		267292	3050718	
109	Tiger tops/Riu Ghat Ghol	Bhimle			223073	3049776	
110	Surung Confluence I	Bhimle	Natural		225124	3048735	
111	Surung Confluence II	Bhimle	Natural		225526	3047964	
112	Surung Confluence III	Bhimle	Natural		225436	3047864	
113	Tented Camp North Ghol	Sukhibhar	Swampy Ghol		225601	3048814	
114	Garud Tal	Sauraha			252949	3049320	
115	Ghaghar Tal	Ghaghar	Swampy		243040	3039241	
116	Gaida Tal	Botesimara	Swampy		239611	3041248	
117	Kasara Pokhari I	Kasara HQ	Artificial Construction		236130	3050067	
118	Kasara Pokhari II	Kasara HQ	Artificial Construction		236063	3049998	
119	Arna Enclosure I	New Arna Enclosure	Artificial Construction		253273	3048701	
120	Arna Enclosure II	New Arna Enclosure	Artificial Construction		252375	3048599	
121	Botesimara Grassland Pokhari I	Botesimara	Artificial Construction		238923	3041701	
122	Botesimara Grassland Pokhari II	Botesimara	Artificial Construction		239211	3041548	
123	ChisaPani Pokhari	Sukhibhar/B hudirapti Phanta	Artificial Construction		226571	3049609	
124	Sukha Pokhari	Sukhibhar/S ukhibhar Phanta	Artificial Construction		226901	3049774	

S.N.	Name of Wetlands/ Waterholes	Location	Types of wetlands	History of wetland	X Coordinate	Y_ Coordinate	Remarks
125	Ghaghar Phanta Pokhari	Ghaghar	Artificial Construction		243021	3039261	
126	Rastrapati Tal	Dumarya	Artificial Construction		244453	3048989	
127	Belsahar Ghat Pokari	Dumarya	Artificial Construction		244588	3051305	
128	Ghatgain Phanta Tal I	Ghatgain	Artificial Construction		240046	3050524	
129	Lami tal Najik ko sano Pokhari	Ghatgain	Artificial Construction		238444	3050897	
130	Ghatgain Phanta Tal II	Ghatgain	Artificial Construction		239946	3050781	
131	Ghatgain Phanta Tal III	Ghatgain	Artificial Construction		240459	3050940	
132	Jarneli Phanta Tal I	Jarneli	Artificial Construction		241586	3050315	
133	Jarneli Phanta Tal II	Jarneli	Artificial Construction		242138	3050562	
134	Ghadiyal Pokhari	Kasara	Artificial Construction		237369	3050677	

Annex 2 : Distribution of Grassland in CNP

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
1	Icharni Phanta Uprooting	Icherny	254592	3050820	3.51	
2	Sauraha Phanta uprooting	Sauraha	253336	3051060	4.35	
3	Singhetal najik phanta uprooting	Baghmara	213897	3049440	3.51	
4	Amaltari Bantapu Phanta	Khoriyamuhan	217564	3051810	5.58	
5	Amaltari Pari Phanta	Khoriyamuhan	215540	3050050	9.82	
6	Amaltari Tapu Phanta	Khoriyamuhan	216424	3051500	7.04	
7	Amaltarighat Phanta 1	Amaltari	215098	3051190	2.97	
8	Amaltarighat Phanta 2	Amaltari	213984	3050910	5.97	
9	Amaltarighat Phanta 3	Khoriyamuhan	217440	3052150	16.91	
10	Amilia Bagar	Dhoba	233487	3043210	0.26	
11	Amilia Phanta	Bankatta	232410	3044890	7.42	
12	Amrite Phanta 1	Amrite	261175	3048280	4.89	
13	Amrite Phanta 10	Chapparchuli	262800	3047430	3.96	
14	Amrite Phanta 2	Amrite	261388	3048950	6.26	
15	Amrite Phanta 3	Amrite	261076	3047420	21.71	
16	Amrite Phanta 4	Amrite	260710	3047230	1.69	
17	Amrite Phanta 5	Amrite	259183	3047110	5.82	
18	Amrite Phanta 6	Amrite	259778	3047170	2.91	
19	Amrite Phanta 7	Amrite	261978	3046880	4.78	
20	Amrite Phanta 8	Chapparchuli	262532	3047170	10.44	
21	Amrite Phanta 9	Chapparchuli	263127	3047280	22.84	
22	Amuwa Phanta 1	Amuwa	258446	3031630	3.33	
23	Amuwa Phanta 2	Amuwa	258613	3031320	0.84	
24	Amuwa phanta 3	Amuwa	258666	3030590	2.11	
25	Amuwa Phanta 3	Amuwa	258265	3033790	2.34	
26	Amuwa Phanta 4	Amuwa	258205	3035080	1.89	
27	Amuwakhola jane bagar	Amuwa	258148	3031530	0.78	
28	Bagai buspark reutapu	Bagai	248406	3035520	1.26	
29	Bagai Chure Area	Bagai	248629	3035910	0.52	
30	Bagai Reucheu Phant	Bagai	248197	3036240	1.89	
31	Bagai Reutapu	Bagai	248548	3035450	0.19	
32	Bagai Uppallo Chure Phant	Bagai	249987	3035610	0.72	
33	Bagaighat Phant	Ghangar	246585	3037510	8.89	
34	Bagarekhola Phant	Bagai	251307	3035720	2.28	
35	Baghdari Phanta	Amaltari	215139	3051620	2.01	
36	Baghmara Phanta	Baghmara	218964	3051180	97.46	
37	Baghmara Phanta	Baghmara	219502	3051040	0.63	
38	Baghmara uprooting	Baghmara	219731	3050610	27.47	
39	Baguwan Tapu	Baguwan	196634	3050670	7.10	
40	Bahapur Phanta	Jarneli	243838	3051110	46.79	
41	Bandarjhulla Ghat Phanta	Bandarjhula	219669	3054300	1.96	
42	Bandarjhulla Island Phanta 1	Bandarjhula	220196	3054880	6.44	
43	Bandarjhulla Island Phanta 2	Bandarjhula	220908	3055270	4.62	
44	Bandarjhulla Island Phanta 3	Bandarjhula	221481	3056070	19.68	
45	Bandarjhulla Island Phanta 4	Bandarjhula	220322	3054320	1.55	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
46	Bandarjhulla Island Phanta 5	Bandarjhula	221389	3056380	16.16	
47	Bandarjhulla Phanta	Bandarjhula	220808	3055860	9.32	
48	Bankatta Phanta 1	Bankatta	230722	3045580	45.73	
49	Bankatta Phanta 2	Bankatta	231668	3045200	3.35	
50	Bardaha Island Phanta 1	Salbas	221971	3054800	4.70	
51	Bardaha Island Phanta 2	Bandarjhula	221111	3054000	2.90	
52	Bardaha Island Phanta 3	Bandarjhula	221697	3055100	2.46	
53	Batule Phant 1	Ghangar	241925	3039680	3.33	
54	Batule Phant 2	Ghangar	242218	3039750	1.50	
55	Batule Phant 3	Botesimara	241685	3040200	0.81	
56	Belsarghat Phant	Belsar	245918	3051160	39.51	
57	Bhalukhola Phanta	Ghatgain	239065	3048050	16.87	
58	Bhalukhola Phanta	Ghatgain	238873	3048160	0.78	
59	Bhangaha Ghat	Meghauri	223816	3052090	39.60	
60	Bhimle Ban Phanta	Bhimle	222808	3051340	1.84	
61	Bhimle east uprooting	Bhimle	224860	3050230	6.91	
62	Bhimle Phanta 1	Bhimle	224793	3050700	33.36	
63	Bhimle Phanta 1	Bhimle	224941	3050440	0.85	
64	Bhimle Phanta 2	Bhimle	224109	3050080	20.49	
65	Bhimpur Salghari Phanta	Bhimpur	253651	3047200	5.37	
66	Bhitri Sano Tapu	Giddeni	231183	3063080	0.65	
67	Bhitri Tapu	Giddeni	231459	3063170	3.66	
68	Bhorlekhola Dovan 1	Bagai	247419	3036660	2.13	
69	Bhorlekhola Phant 1	Bagai	248178	3036680	3.98	
70	Bhorlekhola Phant 2	Bagai	247771	3036670	1.40	
71	Bhorlekhola Phant 3	Bagai	247866	3036910	1.21	
72	Bhorlekhola Reutapu	Bagai	247750	3036510	2.20	
73	Bhosarghat Phanta	Laukhani	221532	3058930	1.67	
74	Bhutaha Tapu	Bhutaha	202576	3050860	4.18	
75	Birendra Bcf Phanta	Kasara (HQ)	238067	3051360	33.86	
76	Bodrahani Phanta	Sauraha	251210	3052350	106.61	
77	Bodrahani Phanta	Sauraha	250426	3051560	1.30	
78	Botesimara Phanta uprooting	Botesimara	238899	3041410	5.29	
79	Botesimara Reu Tapu	Botesimara	238309	3041000	3.70	
80	Botesimara Reucheu Phant	Botesimara	239375	3040690	11.49	
81	Botesimara Simalchaur	Botesimara	238491	3041600	53.47	
82	Botesimara Simalchaur	Botesimara	238861	3041420	24.25	
83	Brahmasthan Phanta	Amaltari	212061	3051830	8.33	
84	Budhirapti east uprooting	Sukibhar	225924	3049960	0.02	
85	Budhirapti Phanta	Bhimle	225242	3050240	100.62	
86	Budhirapti Phanta	Bhimle	225040	3050210	18.84	
87	Bulbule Phant 1	Ghangar	241726	3039330	5.15	
88	Bulbule Phant 2	Botesimara	241398	3039370	4.81	
89	Chamka Phanta	Khoriyamuhan	214921	3050490	40.50	
90	Chapparchuli uprooting grassland	Chapparchuli	263610	3050000	11.67	
91	Chapparchuli Phant 1	Chapparchuli	264743	3048980	119.59	
92	Chapparchuli Phant 1	Chapparchuli	263960	3049690	9.78	
93	Chapparchuli Phant 10	Chapparchuli	263369	3048190	7.13	
94	Chapparchuli Phant 2	Pyaridhap	265142	3049640	15.37	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
95	Chapparchuli Phant 3	Chapparchuli	265454	3049030	15.61	
96	Chapparchuli Phant 4	Chapparchuli	264136	3047850	30.26	
97	Chapparchuli Phant 5	Chapparchuli	264226	3048380	4.32	
98	Chapparchuli Phant 6	Chapparchuli	263748	3047330	8.77	
99	Chapparchuli Phant 7	Chapparchuli	262877	3048060	4.70	
100	Chapparchuli Phant 8	Chapparchuli	262627	3049040	66.76	
101	Chapparchuli Phant 9	Chapparchuli	262995	3049700	4.63	
102	Chardhyong Phanta 1	Liglige	272653	3050490	86.49	
103	Chardhyong Phanta 2	Khagendramalli	270193	3051290	83.23	
104	Charhara Phanta	Dhudhaura	247767	3051220	81.41	
105	Chipleghat-Khadgauli Phanta	Kasara (HQ)	234820	3050470	22.27	
106	Chisapani Phanta	Kasara (HQ)	234908	3049900	8.01	
107	Chisapani Phanta	Kasara (HQ)	234765	3049960	4.70	
108	Dabuwa dovan	Bagai	253526	3033890	0.08	
109	Dabuwa Phanta 1	Amuwa	255787	3034910	3.11	
110	Dabuwa Phanta 2	Bagai	253837	3034060	0.93	
111	Dabuwa Phanta 3	Bagai	254080	3034190	1.24	
112	Dabuwa Phanta 4	Amuwa	254729	3034330	0.71	
113	Dabuwa Phanta 5	Amuwa	255174	3034400	0.62	
114	Dabuwa Phanta 6	Amuwa	255476	3034590	1.97	
115	Dabuwa Salghari Phant 1	Bagai	254099	3033640	0.07	
116	Deurali Phanta 1	Amuwa	255742	3033260	3.08	
117	Deurali Phanta 2	Amuwa	256342	3032960	1.06	
118	Deurali Phanta 3	Amuwa	256584	3033050	0.55	
119	Devitaal Phanta	Khoriyamuhan	217671	3049390	5.31	
120	Devitaal Phanta	Khoriyamuhan	217609	3049360	8.20	
121	Devital najik uprooting	Khoriyamuhan	217244	3049380	16.06	
122	Dhajaha Phanta	Sheri	206852	3049860	41.05	
123	Dhampoos Phanta	Dhruba	230484	3051320	105.84	
124	Dhoba Phanta	Dhoba	234311	3043380	16.22	
125	Dhoba Reupari Phant	Dhoba	235360	3043020	0.40	
126	Dhruba Dakshin Phanta	Dhruba	232601	3049800	3.15	
127	Dhruba Dakshin Phanta	Dhruba	232229	3049620	6.00	
128	Dhruba Dakshin Phanta	Dhruba	232423	3049680	0.00	
129	Dhruba Dakshin Phanta	Dhruba	232423	3049680	0.00	
130	Dhruba Ghat 1	Dhruba	233060	3051080	9.97	
131	Dhruba Ghat 2	Dhruba	233198	3050620	17.59	
132	Dhruba Ghat 2	Dhruba	233099	3050440	0.84	
133	Dhruba Ghol Phanta	Dhruba	233273	3049410	17.21	
134	Dhruba Island Phanta 1	Dhruba	232775	3051330	21.55	
135	Dhruba Uttar Phanta	Dhruba	232800	3050090	1.42	
136	Dhudhaura Phanta	Dhudhaura	249036	3052240	22.33	
137	Dhupighari Ghasemaidan	Laukhani	220477	3057990	21.55	
138	Dhurba Lamiphant	Dhruba	231452	3049170	3.26	
139	Dhurba Phanta uprooting	Dhruba	232892	3050380	15.82	
140	Dibyapuri Pari Phanta	Kujauli	225921	3061510	1.05	
141	Dibyapuri Phanta	Kujauli	224877	3061760	24.96	
142	Diyalo Tapu Phanta	Ganjapur	234282	3064290	14.93	
143	Dobhan Bcf Phanta	Dhruba	232146	3051450	4.55	
144	Dumariya Phanta 1	Dumariya	245776	3050630	65.48	
145	Dumariya Phanta 2	Dumariya	246772	3049450	163.21	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
146	Dumariya Phanta 3	Kachhuwani	248652	3049610	220.80	
147	Dumariya Phanta uprooting	Dumariya	244711	3050010	10.23	
148	Dumariya Phanta uprooting phanta	Dumariya	244836	3051080	7.74	
149	Dumariya Raptiside	Dumariya	245671	3051160	9.55	
150	Gadeshkunja phant	Laukhani	221078	3059140	1.42	
151	Gadesimalchaur 1	Botesimara	240378	3040910	5.32	
152	Gadesimalchaur 2	Botesimara	240362	3040600	0.20	
153	Gainda Ghol Phanta	Botesimara	239906	3041260	3.69	
154	Gainda Phanta	Chapparchuli	261839	3050260	226.93	
155	Gaindakhosa Phanta	Temple Tiger	209034	3050060	18.86	
156	Gajipur Tapu	Ganjapur	231920	3062840	23.98	
157	Ganjipur Ghat	Ganjapur	232907	3063800	3.84	
158	Ganjipur Phanta	Ganjapur	233268	3062550	5.97	
159	Ganjipur Sanotapu	Ganjapur	232001	3063350	3.53	
160	Ganjipur Tapu Pahilo	Ganjapur	232718	3063050	17.12	
161	Gaurinagar Phant	Botesimara	240107	3040110	8.21	
162	Gaurmachhan Phanta 1	Belsar	243615	3051700	69.85	
163	Gaurmachhan Phanta 2	Dumariya	245404	3050130	23.63	
164	Ghagar Lami Phanta	Ghangar	242815	3038780	8.06	
165	Ghagar Phanta	Ghangar	243118	3039230	4.61	
166	Ghagar Reucheu	Ghangar	243501	3038370	3.89	
167	Ghangar Upallo Phant	Ghangar	242707	3039720	4.07	
168	Ghatgain Ghat Phanta	Ghatgain	239187	3051860	12.05	
169	Ghatgain Phanta 1	Ghatgain	239115	3050520	61.92	
170	Ghatgain Phanta 1	Ghatgain	239664	3050800	10.57	
171	Ghatgain Phanta 2	Ghatgain	239918	3050000	2.12	
172	Ghatgain Phanta 3	Ghatgain	240066	3049320	1.59	
173	Ghatgain Phanta 4	Ghatgain	240703	3050910	2.08	
174	Ghatgain Phanta 5	Ghatgain	239995	3049610	7.35	
175	Ghatgain south uprooting	Ghatgain	240040	3050190	3.77	
176	Ghol Tapu 1	Giddeni	228576	3062290	1.45	
177	Ghol Tapu 2	Kujauli	228345	3062240	3.75	
178	Ghol Tapu 3	Kujauli	228252	3062440	6.67	
179	Ghol Tapu 4	Kujauli	227810	3062250	3.88	
180	Ghol Tapu 5	Kujauli	227569	3062210	0.82	
181	Ghol Tapu 6	Giddeni	228785	3062720	9.90	
182	Gidaha Pari Phanta 1	Giddeni	230414	3061490	12.60	
183	Gidaha Pari Phanta 2	Giddeni	230987	3062090	13.13	
184	Gidaha Tapu 1	Giddeni	229999	3063220	2.53	
185	Gidaha Tapu 2	Giddeni	229795	3062880	2.49	
186	Gidaha Tapu 3	Giddeni	229392	3062550	6.58	
187	Gidaha Tapu 4	Giddeni	229789	3062260	3.67	
188	Gidaha Tower	Giddeni	230878	3062760	3.32	
189	Golaghat Phanta	Baghmara	220160	3053230	8.93	
190	Green belt area		223825	3048720	18.53	
191	Gurmi Phant 1	Tamaspur	200936	3050060	43.09	
192	Gurmi Phant 2	Tamaspur	199701	3050350	34.87	
193	Gurmi Phant 3	Tamaspur	200656	3050670	21.28	
194	Hardakhola Chure Phanta 1	Liglige	271016	3047050	5.06	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
195	Hardakhola Chure Phanta 2	Liglige	271025	3046360	6.02	
196	Hardakhola Chure Phanta 3	Khagendramalli	266485	3046250	2.23	
197	Hardakhola Phanta 2	Khagendramalli	269347	3051180	21.80	
198	Hariyali Phanta 1	Dhruba	233830	3051770	12.12	
199	Hariyali Phanta 2	Dhruba	234166	3051270	17.44	
200	Hatchery Pari Ko Phanta	Giddeni	231758	3063160	1.38	
201	Hattikhet Phanta	Bhimpur	255606	3047670	17.02	
202	Hileghat Phant	Bagai	253579	3034070	1.16	
203	Icherny Phanta	Icherny	255171	3051300	0.06	
204	Jaimangala phanta uprooting	Sauraha	251751	3051450	5.07	
205	Janakpur Phanta	Janakpur	259980	3050310	14.38	
206	Jankauli CF ghasemaidan	Icherny	254744	3051650	0.89	
207	Jarneli Phant 1	Jarneli	241183	3050640	9.84	
208	Jarneli Phant 2	Jarneli	243374	3050030	31.83	
209	Jarneli Phant 3	Jarneli	241822	3050270	3.20	
210	Jarneli Phant 3	Jarneli	241750	3050270	0.52	
211	Jarneli Phant 4	Jarneli	242671	3050540	1.77	
212	Jogimara Phanta	Lamichaur	217094	3053680	1.70	
213	Kachhuwani Ambush phanta uprooting	Kachhuwani	250362	3051320	10.18	
214	Kachhuwani Phanta 1	Kachhuwani	249626	3050320	127.19	
215	Kachhuwani Phanta 1	Kachhuwani	249787	3050100	14.38	
216	Kachhuwani phanta uprooting	Kachhuwani	250088	3049850	8.29	
217	Kaliban Phanta	Sheri	203326	3050080	7.60	
218	Kasara Phanta uprooting	Kasara (HQ)	234687	3049990	3.31	
219	Kasara Tappu	Kasara (HQ)	236782	3050540	2.31	
220	Katlekhola Chheu 1	Sunachuri	275089	3048090	1.27	
221	Katlekhola Chheu 2	Sunachuri	275577	3047280	0.94	
222	Katlekhola Chheu 3	Sunachuri	275580	3046920	0.30	
223	Katlekhola Chheu 4	Sunachuri	275587	3046780	0.70	
224	Katlekhola Chheu 5	Sunachuri	275672	3046580	0.66	
225	Katlekhola Chheu 6	Sunachuri	275770	3045670	3.43	
226	Katlekhola Chure Phant	Sunachuri	274893	3043780	2.33	
227	Kavretaal Phanta	Baghmara	219534	3050110	17.06	
228	Kavretaal Phanta	Baghmara	219699	3050340	1.00	
229	Kawathis Tapu	Laukhani	221011	3058120	3.82	
230	Khagendramalli GJL	Khagendramalli	267599	3050860	22.17	
231	Khagendramalli Phanta 1	Pyaridhap	266323	3050580	4.65	
232	Khagendramalli Phanta 1	Pyaridhap	266800	3050570	1.99	
233	Khagendramalli Phanta 10	Khagendramalli	268522	3050920	6.00	
234	Khagendramalli Phanta 2	Khagendramalli	267000	3050570	2.39	
235	Khagendramalli Phanta 2	Khagendramalli	267027	3050540	5.64	
236	Khagendramalli Phanta 3	Khagendramalli	266886	3050230	1.20	
237	Khagendramalli Phanta 4	Khagendramalli	267356	3050550	4.94	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
238	Khagendramalli Phanta 4	Khagendramalli	267390	3050660	5.49	
239	Khagendramalli Phanta 5	Khagendramalli	267542	3050080	5.41	
240	Khagendramalli Phanta 6	Khagendramalli	267800	3050690	7.02	
241	Khagendramalli Phanta 7	Khagendramalli	267865	3050850	0.03	
242	Khagendramalli Phanta 7	Khagendramalli	267705	3050810	2.09	
243	Khagendramalli Phanta 8	Khagendramalli	268502	3051260	5.39	
244	Khagendramalli Phanta 8	Khagendramalli	268292	3051090	0.20	
245	Khagendramalli Phanta 9	Khagendramalli	269258	3050570	2.08	
246	Kharkatta Phuraut Phanta	Surung Khola	225467	3048450	348.95	
247	Kharkatta Phuraut Phanta	Surung Khola	224084	3048690	48.42	
248	Kharkatta Phuraut Phanta	Surung Khola	223902	3048860	25.25	
249	Khoriyamuhan Phanta	Khoriyamuhan	218364	3050240	29.94	
250	Khoriyamuhan Tapu 1	Khoriyamuhan	217210	3050910	15.48	
251	Khoriyamuhan Tapu 2	Khoriyamuhan	216696	3050060	2.04	
252	Khoriyamuhan Tapu 3	Khoriyamuhan	216118	3050310	12.60	
253	Kolkatta Phanta	Bhutaha	204529	3050660	17.54	
254	Krishnagar Core	Ghangar	247185	3037410	0.83	
255	Krishnanagar Phant	Ghangar	245740	3037720	2.91	
256	Kujauli GI Phanta	Giddeni	228920	3062310	2.06	
257	Kujauli Pari Phanta	Kujauli	226182	3062220	3.63	
258	Kujauli Phanta 1	Kujauli	226376	3062880	22.81	
259	Kujauli Phanta 2	Kujauli	226493	3062380	1.65	
260	Kumarbarti Phanta	Divyapuri	222940	3061020	2.17	
261	Kumroj phant 2	Icherny	255938	3050660	0.00	
262	Kumroj phant 3	Icherny	256133	3050610	0.00	
263	Kumroj Phanta	Janakpur	257990	3049470	50.76	
264	Laguna Machan south uprooting	Jarneli	241554	3050290	15.55	
265	Laguna North 12 uprooting	Jarneli	241469	3051070	4.97	
266	Lamichaur Ghol Phanta	Lamichaur	217484	3054780	4.45	
267	Lamitaal ni uprooting	Ghatgain	239488	3050860	11.59	
268	Lamitaal Phanta 1	Ghatgain	239090	3050660	0.28	
269	Lamitaal Phanta 1	Ghatgain	239232	3050700	1.01	
270	Lamitaal Phanta 2	Ghatgain	238782	3050840	1.68	
271	Laugai Tapu 1	Divyapuri	222686	3060350	5.43	
272	Laugai Tapu 2	Laukhani	221883	3060440	9.16	
273	Laukhani Tapu Phanta	Laukhani	221482	3059620	17.98	
274	Liglige Phanta 6	Liglige	274911	3049360	120.75	
275	Liglige Phanta 7	Liglige	273639	3050410	3.99	
276	Majhuwa Tapu 1	Ganjapur	236343	3065270	4.08	
277	Majhuwa Tapu 2	Bhutaha	202281	3050570	10.78	
278	Majorghat Phanta	Kasara (HQ)	237236	3050800	5.35	
279	Materi Bagwan	Baguwan	197032	3049990	23.99	
280	Materighat Phanta	Baghmara	221494	3051520	47.47	
281	Mayurtika Phanta	Lamichaur	218277	3056490	17.09	
282	Meghauli Pari Ghat	Meghauli	225054	3051900	15.00	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
283	Meghauliban Phanta	Meghauri	225665	3052370	1.33	
284	Mutahaghol Phanta	Laukhani	221007	3058650	2.38	
285	Namuna Ghasemaidan 1	Bandarjhula	219361	3057020	59.27	
286	Namuna Ghasemaidan 2	Laukhani	219166	3057520	0.60	
287	Nandapur Tapu Phanta 1	Temple Tiger	210128	3051180	52.79	
288	Nandapur Tapu Phanta 2	Temple Tiger	209166	3051030	16.96	
289	Nandapur Tapu Phanta 3	Temple Tiger	211010	3051530	17.76	
290	Narayani Phanta 1	Divyapuri	223444	3061470	2.50	
291	Narayani Phanta 2	Divyapuri	223598	3061260	0.38	
292	Narayani Phanta 3	Divyapuri	223859	3061140	3.49	
293	Narayanicheu Phanta	Kujauli	225714	3062180	17.21	
294	Narayanipari Phanta	Divyapuri	223434	3060180	6.39	
295	Niure Phanta	Kasara (HQ)	235456	3049530	10.06	
296	Old Gaur Machan Phanta	Dumariya	245463	3049720	6.65	
297	Paanch Pandav Phanta	Bankatta	229699	3046220	31.35	
298	Padampur Phanta 1	Bhimpur	255017	3049710	1539.85	
299	Padampur Phanta 1	Bhimpur	258081	3048590	12.06	
300	Padampur Phanta 1	Bhimpur	251794	3051310	25.91	
301	Padampur Phanta 1	Bhimpur	250480	3051200	3.51	
302	Padampur Phanta 2	Bhimpur	256890	3048290	7.50	
303	Padampur Phanta 3	Bhimpur	256697	3049590	64.65	
304	Patihani Raptibagar 1	Ghatgain	240196	3051990	3.60	
305	Pyaridhap Phant	Pyaridhap	265349	3050980	330.23	
306	Raighat Phanta	Ghangar	244645	3038490	7.58	
307	Rani Khola Phanta	Ghatgain	240364	3050150	1.71	
308	Rani Khola Phanta	Ghatgain	240171	3050170	3.04	
309	Rapti Doon Phanta 1	Sukibhar	228771	3051680	43.30	
310	Rapti Doon Phanta 2	Sukibhar	229868	3051570	32.86	
311	Rapti Pul Phanta	Kasara (HQ)	235317	3050800	52.96	
312	Rastrapati Phanta uprooting	Kasara (HQ)	238774	3048100	6.47	
313	Rateni Ghat Phanta 1	Dhoba	236709	3042650	33.40	
314	Reu Dhobhan Phanta	Baghmara	221249	3050730	26.31	
315	Sailimaili Phanta	Temple Tiger	213235	3049300	9.85	
316	Sanaghat Phanta	Bhimle	222415	3051380	1.96	
317	Sano Dhampoos Phanta 1	Sukibhar	228865	3050820	2.63	
318	Sano Jarneli Phant	Jarneli	242326	3050130	26.18	
319	Sauraha Hattisar Phanta 1	Sauraha	253782	3052060	14.37	
320	Sauraha Raptiside Phanta	Sauraha	254885	3050540	339.92	
321	Sauraha Raptiside Phanta	Sauraha	254489	3050520	29.95	
322	Sauraha Raptiside Phanta	Sauraha	253274	3051040	1.42	
323	Sheri Pari Tapu	Bhutaha	201754	3050610	5.79	
324	Sheri Phanta	Sheri	205270	3049470	18.04	
325	Sheri Tapu	Sheri	203988	3049770	6.88	
326	Sheriban Phanta	Bhutaha	201824	3049980	5.15	
327	Sikhrauli Tapu Phanta	Giddeni	231379	3062740	6.04	
328	Simalghari Phanta	Kachhuwani	248182	3051300	21.93	
329	Siraki Tapu 1	Kujauli	227587	3062710	2.92	
330	Siraki Tapu 2	Kujauli	227832	3062500	1.50	
331	Siraki Tapu 3	Kujauli	227181	3062620	4.28	
332	Siraki Tapu 4	Kujauli	227296	3062670	0.79	
333	Siraki Tapu 5	Kujauli	227819	3062680	0.61	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
334	Sirke Tapu 1	Divyapuri	224251	3060340	3.08	
335	Sirke Tapu 2	Divyapuri	224918	3060620	2.21	
336	Siswar Bich Tapu	Siswar	228381	3059850	3.29	
337	Siswar Ghat Daya	Siswar	230094	3060210	3.73	
338	Siswar Ghat Phanta	Siswar	228302	3059380	2.65	
339	Siswar Pari Phanta	Salbas	223806	3058210	5.16	
340	Siswar Tapu 1	Siswar	227312	3058830	6.28	
341	Siswar Tapu 2	Siswar	226329	3058730	1.52	
342	Siswar Tapu 3	Siswar	226364	3058330	10.17	
343	Siswar Tapu 4	Siswar	227686	3058700	0.20	
344	Siswar Tapu 5	Siswar	227074	3057780	0.91	
345	Siswar Tapu 6	Siswar	227618	3059100	2.97	
346	Siswarban Phanta 1	Kujauli	225309	3059550	3.71	
347	Siswarban Phanta 2	Siswar	226081	3059430	7.83	
348	Siswarban Phanta 3	Siswar	226696	3059700	4.30	
349	Siswarban Tapu	Siswar	228595	3060310	6.60	
350	Sitamai Phant	Jarneli	241952	3051100	82.45	
351	Sitamai Phant	Jarneli	241531	3051110	22.53	
352	Suka Raj Phanta	Bhutaha	203409	3050520	13.31	
353	Sukhibhar Lamiphanta	Sukibhar	230090	3049490	12.15	
354	Sukhibhar uprooting	Sukibhar	228182	3048630	14.23	
355	Sukibhar Complex Phant	Sukibhar	227293	3050070	491.89	
356	Sukibhar Complex Phant	Sukibhar	228270	3048870	0.74	
357	Sukibhar Complex Phant	Sukibhar	226216	3049720	22.96	
358	Sukibhar Machan Phanta	Sukibhar	228652	3048460	39.36	
359	Sukibhar Machan Phanta	Sukibhar	228411	3048590	4.93	
360	Sukibharcheu Phanta	Sukibhar	229270	3049910	4.84	
361	Sunachari Phanta	Sunachuri	276476	3048700	42.48	
362	Surung khola Phanta	Surung Khola	223946	3048550	30.07	
363	Syalbaas Pariban	Siswar	226162	3057920	2.13	
364	Syalbaas Tapu Phanta 1	Salbas	222681	3055900	6.81	
365	Syalbaas Tapu Phanta 2	Salbas	223474	3056250	5.24	
366	Tamartaal south uprooting	Kasara (HQ)	236851	3048110	3.86	
367	Tamaspur Ghat 1	Tamaspur	198546	3050840	6.97	
368	Tamaspur Ghat 2	Tamaspur	199435	3051190	13.47	
369	Tamor Tal Phanta 1	Kasara (HQ)	237024	3048070	5.79	
370	Tamor Tal Phanta 1	Kasara (HQ)	236953	3048110	1.93	
371	Tamor Tal Phanta 2	Kasara (HQ)	237842	3048170	15.57	
372	Tamor Tal Phanta 3	Kasara (HQ)	236236	3047910	3.58	
373	Temple Baya Phanta	Amaltari	214481	3050130	16.40	
374	Temple Ghat Phanta	Temple Tiger	211831	3050420	226.75	
375	Temple Grassland uprooting	Temple Tiger	211057	3049660	15.21	
376	Temple Tapu Pari Phanta	Temple Tiger	210386	3051880	16.32	
377	Temple Tapu Phanta 1	Temple Tiger	210917	3051250	4.95	
378	Temple Tapu Phanta 2	Temple Tiger	210838	3050960	6.06	
379	Temple Tiger Phanta (Mohan Khola)	Temple Tiger	211228	3049370	6.16	
380	Temple Tiger Phanta (Mohan Khola)	Temple Tiger	211134	3049410	1.81	
381	Thapaliya taal uprooting	Kasara (HQ)	234783	3048640	11.36	
382	Thapaliya Tal Sano Phanta	Kasara (HQ)	235044	3048460	1.18	

S.N.	Name	NearPost	X_Coordinate	Y_Coordinate	Area (Ha.)	Remarks
383	Thapaliya Tal Thulo Phanta	Dhruba	234208	3049040	13.39	
384	Thapaliya Tal Thulo Phanta	Dhruba	234407	3049080	0.03	
385	Thotari Taal Phanta	Bankatta	229039	3047040	62.47	
386	Tigertops Phanta 1	Bhimle	223158	3050030	40.51	
387	Tigertops Phanta 1	Bhimle	223226	3049910	20.11	
388	Tigertops Phanta 2	Bhimle	222166	3049990	51.66	
389	Tigertops Phanta uprootingn	Tigertops	223315	3050110	0.21	
390	Tigertopsghat Phanta	Meghauri	225424	3051940	105.90	
391	Ultikhola Phant	Bhutaha	201571	3051500	13.65	
392	Upallo Ghagar Phant	Ghangar	243617	3038900	1.97	
393	Upallo Siswar Tapu	Sisawar	229886	3060550	6.27	

Annex 3: Details of Watch Tower with its GPS Location

S.N.	Name of the Tower	Posts	Types of Towers	Propose	X Coordinate	Y Coordinate	Remarks
1	1 No. Machan	Sauraha	Wooden	Tourism+ Ambush	251666	3051924	
2	2 No. Machan	Sauraha	Wooden	Tourism+ Ambush	250363	3051545	
3	Amrite Machan	Amrite	Concrete	Ambush	260418	3048510	
4	Baghmara Machan	Baghmara	Concrete	Tourism+ Ambush	219887	3050978	
5	Belsahar Ghat Machan	Dumariya	Wooden	Ambush	244552	3051810	
6	Bhalukhola Machan	Kasara	Wooden	Tourism+ Ambush	239319	3049669	
7	Bhimle Machan	Bhimle	Concrete	Tourism+ Ambush	224262	3050691	
8	Bhimpur Machan	Bhimpur	Concrete	Tourism+ Ambush	253101	3048284	
9	Botesimara RCC Machan	Botesimara	Concrete	Tourism+ Ambush	225722	3050087	
10	Budhirapti Kathe Machan	Sukhibhar	Wooden	Tourism+ Ambush	225722	3050087	
11	Chaparchuli Machan	Chaparchuli	Wooden	Ambush	263866	3050109	
12	Charara Chowk/Kachhuwani Chowk Machan	Kachhuwani	Concrete	Tourism+ Ambush	248323	3050431	
13	Dabuwa Khola Kathe Machan	Bagaimadi Sector	Wooden	Ambush	253348	3034005	
14	Dabuwa Khola Machan	Bagaimadi Sector	Concrete	Tourism+ Ambush	254178	3033562	
15	Dhampuse Ghat Machan	Dhruba	Wooden	Ambush	262620	3050964	
16	Dudhaura Kathe Machan I	Dudhaura	Wooden	Ambush	247921	3052250	Constructe d by Mrigakunj

S.N.	Name of the Tower	Posts	Types of Towers	Propose	X Coordinate	Y Coordinate	Remarks
17	Dudhaura Kathe Machan II	Dudhaura	Wooden	Ambush	247793	3052173	BzUC in 2063 BS)
18	Dumariya Kathe Machan	Dumariya	Wooden	Tourism+ Ambush	244806	3050445	
19	Dumariya Pakki Machan	Dumariya	Concrete	Tourism	244840	3050406	
20	Gaindakhasa Machan	Temple Tiger	Concrete	Tourism+ Ambush	211988	3050338	
21	Gaur Machan	Dumariya+Kachhuwani	Wooden	Tourism+ Ambush	246405	3049977	
22	Ghatgain Machan	Ghatgain	Concrete	Tourism	239360	3050739	
23	Hardakhola Machan	Amrite+Khage ndramalli	Concrete	Tourism+ Ambush	271600	3050397	
24	Hardakhola Ratomate Machan	Amrite+Khage ndramalli	Concrete	Tourism+ Ambush	272080	3041950	
25	Jarneli Ambush Machan	Jarneli	Wooden	Ambush	242418	3050466	
26	Kachhuwani Concrete Machan	Kachhuwani	Concrete	Tourism	249460	3049700	
27	Kachuwaani Machan	Kachhuwani	Wooden	Tourism	249658	3049673	
28	Khoriyamuhan Machan	Khoriyamuhan	Concrete	Tourism+ Ambush	217791	3050411	
29	Laguna Machan	Jarneli	Concrete	Tourism	241651	3050506	
30	Lami Tal Machan	Ghatgain	Wooden	Tourism+ Ambush	238834	3050624	
31	Nandan Tal Machan	Kachhuwani	Wooden	Ambush	250422	3048865	
32	Naya Arna Enclosure Machan	Arna Enclosure	Concrete	Tourism+ Ambush	252584	3048825	
33	Purano Arna Enclosure Machan	Arna Enclosure	Wooden	Tourism+ Ambush	252588	3048803	
34	Riu Machan - Near Riu Bridge	Bankatta	Wooden	Tourism+ Ambush	230909	3045604	
35	Riu Machan (Amiliya)	Bankatta	Wooden	Tourism+ Ambush	230887	3045480	
36	Safari Ghat Machan	Ghatgain	Wooden	Ambush	239472	3051989	
37	Sukhibhar Machan	Sukhibhar	Concrete	Tourism	228401	3048825	
38	Sukhibhar Phanta Kathe Machan	Sukhibhar	Wooden	Ambush	228627	3048537	
39	Tammor Tal Machan	Kasara	Concrete	Tourism+ Ambush	236226	3047992	
40	Thapaliya Tal Machan	Kasara	Wooden	Tourism+ Ambush	234422	3049100	
41	Devi Tal Machan	Khoriyamuhan	Concrete	Tourism+ Ambush	217129	3049462	

Annex 4: Location of Posts

S.N.	Name of The Post	Category	Management	X_Coordinate	Y_Coordinate	Remarks
1	Amaltari	Sector Office	Park+Army	213829	3052360	
2	Amrite	Post	Park+Army	260448	3048520	
3	Amuwa	Post	Army	258203	3031480	
4	Bagai	Sector Office	Park+Army	248688	3035470	
5	Baghwan	Post	Army	195924	3051470	
6	Bagmara	Post	Park+Army	219876	3051040	
7	Balmiki ashram	Post	Park+Army	198921	3039400	
8	Bandarjhula	Post	Army	220525	3056240	
9	Bankatta	Range Post	Army+Park	230864	3045780	
10	Barandabhar	Post	Army	249472	3057540	
11	Belsaar	Post+Hattisar	Park	244879	3053460	
12	Bhawanipur	Post	Park	250735	3049290	
13	Bhimle	Gulm	Park+Army	224038	3050750	
14	Bhimpur	Post	Army	253020	3048190	
15	Bhutaha	Post	Park	206868	3051450	
16	Bishazari	Post	Army	247112	3057140	
17	Botesimara	Post	Park+Army	239181	3041640	
18	Chaparchuli	Post	Army	263867	3050110	
19	Deepanagar, Thori	Post	Park	262732	3029990	
20	Devnagar	Range Post	Park	244942	3056670	
21	Dhoba	Post	Park+Army	234648	3043570	
22	Dhurba	Post	Park+Army	232545	3050060	
23	Dibyapuri	Post+Hattisar	Park+Army	225701	3061510	
24	Dudhaura	Post	Army	249164	3052770	
25	Dumaria	Post	Park+Army	244836	3050500	
26	Ganjipur	Post	Army	233309	3062230	
27	Ghanghar	Post	Park+Army	243182	3039320	
28	Ghatgain	Post	Park+Army	239407	3050770	
29	Giddeni	Post	Park+Army	232882	3064390	
30	Icharni	Post	Park	255770	3051470	
31	Ichchhanagar	Range Post	Park+Army	269648	3031950	
32	Janakpur	Post	Park	258878	3050720	
33	Jarneli	Post	Army	242415	3050470	
34	Kachuwani	Post	Army+Park	249278	3049800	
35	Kasara	Headquarter	Park+Army	236243	3050070	
36	Khagendramalli	Range Post	Park+Army	266669	3050390	
37	Khoriyamuhan	Post	Park+Army	217705	3050390	
38	Khorsor	Hattisar	Park	249594	3053530	
39	Kujauli	Range Post	Park	227524	3063040	
40	Lamichaur	Post	Park+Army	216810	3054530	
41	Laukhani	Range Post	Park+Army	221045	3060190	
42	Liglige	Post	Park+Army	272834	3049280	
43	Meghauri	Range Post	Park+Army	225215	3053300	

S.N.	Name of The Post	Category	Management	X_Coordinate	Y_Coordinate	Remarks
44	Raptipool Gate	Post	Park+Army	235907	3050060	
45	Sainlimaili	Post	Park+Army	213441	3049100	
46	Sauraha	Sector Office	Park+Army	253100	3052450	
47	Sheri	Post	Army	205261	3049320	
48	Siswar	Post+Hattisar	Park+Army	228841	3059310	
49	Sukibhar	Post	Park+Army	228362	3048860	
50	Sunachuri	Range Post	Park+Army	276879	3048930	
51	Surungkhola	Post	Army	222903	3049380	
52	Syalbas	Post	Army	223339	3055380	
53	Tamaspur	Range Post	Park+Army	197841	3052470	
54	Temple tiger	Post	Army	211365	3049370	
55	Tribeni	Range Post	Park+Army	197735	3042690	

Annex 5: Details of Culverts/Bridge with its GPS Location

S.N.	Place Name	X_Coordinate	Y_Coordinate	Remarks
1	Bahapur khola	243974	3050234	
2	Pandit khola 2	243569	3050363	
3	Mate ghol	243269	3050433	
4	Bhalukhola 2	238864	3049719	
5	Kasara khola 2	238783	3049710	
6	Near GBC Maikeniya phanta	237389	3050686	
7	Near kasara khola	237947	3049579	
8	East of Tamor tal	237145	3048072	
9	Near Kasara office	236807	3049494	
10	On the Sauraha highway to thapaliya tal	236100	3049344	
11	Kasara First Culvert	236500	3050299	
12	Kasara Sauraha road 1st culvert	237923	3049588	
13	Kasara khola east 1st culvert	238788	3049714	
14	Kasara khola east 2nd culvert	238871	3049725	
15	Bhalu khola Bridge	238995	3049768	
16	Rani Khola Bridge	240650	3050112	
17	Rani khola East 1st culvert	241018	3050126	
18	Rani Khola East 2nd culvert	241126	3050308	
19	Laguna Tal West Culvert	241227	3050509	
20	Laguna tal culvert	241477	3050532	
21	Jarneli Khola Bridge	242572	3050395	
22	Jarneli East Birdge	242835	3050479	
23	Jarneli East 2nd Culvert	243265	3050439	
24	Jarenli East 3rd Culvert	243571	3050371	
25	Jarneli East 4th Bridge	243646	3050311	
26	Jarneli East 5th Culvert	243966	3050251	
27	Dumariya West 1st Bridge	244141	3050322	
28	Dumariya post Bridge	244823	3050514	
29	Dumariya East Culvert	246987	3050278	

S.N.	Place Name	X_Coordinate	Y_Coordinate	Remarks
30	Dudhaura Khola Bridge	249024	3050852	
31	2 Number Bridge	250236	3051462	
32	Kasara west Culvert	236081	3049323	
33	Thapaliya Tal outlet	234324	3049080	
34	Budirapti Khola	225596	3050102	
35	Tiger tops 1st	222532	3049518	
36	Tiger tops 2nd	222423	3049545	
37	Tiger tops 3rd	221721	3049721	
38	Munda Tal	220096	3050605	
39	Lama Tal	218336	3050575	
40	Sukhibhar khola	228274	3048905	
41	Sukhibhar Bankatta khola	228376	3048681	
42	Kamal tal Khola	229460	3048682	
43	Kasara mandir East	236500	3049517	
44	Temple tiger area 1	211700	3049338	
45	Temple tiger area 2	211875	3049445	
46	Temple tiger area 3	212381	3049608	
47	Temple tiger area 4	212868	3050080	
48	Ring road (Kasara) bridge	234374	3049886	
49	Tamor Tal bridge	237146	3048071	
50	Near kachhuwani Post	249010	3049981	
51	On th way from Kachhhuwani to Bhimpur I	252242	3048092	
52	On th way from Kachhhuwani to Bhimpur II	251607	3048330	
53	Kamal Tal Pul	229469	3048382	

Annex 6: Location of Buffer Zone User Committee of CNP

S.N.	User Committee Name	Working Area	X_Coordinate	Y_Coordinate	Remarks
1	Amaltari	20.51	213238	3054620	
2	Bagauda Sub-Committee	42.34	233600	3037580	
3	Budhirapti	18.73	258036	3051950	
4	Daunnedevi	34.54	196609	3053560	
5	Gosainbaba	12.67	203134	3053030	
6	Kalabanjar	20.17	230030	3058940	
7	Kerunga	24.46	232885	3052760	
8	Khagendramalli	24.21	264185	3053260	
9	Lamichaur	40.25	218222	3057970	
10	Lothar	23.17	272691	3051520	
11	Meghauri	29.65	224577	3053980	
12	Mirgakunj	25.44	253670	3055320	
13	Nanda Bhauju	18.93	207888	3052600	
14	Nirmal Thori	96.13	262968	3026580	
15	Panchpandav	26.55	231160	3041820	
16	Patihani	9.31	240007	3053750	
17	Sikhraili	11.28	233047	3065220	

S.N.	User Committee Name	Working Area	X_Coordinate	Y_Coordinate	Remarks
18	Sishwar	14.48	225575	3063630	
19	Ayodhyapuri	105.74	246886	3033880	
20	Rewa	43.43	237388	3036120	
21	Tribeni	15.94	195002	3042100	
22	Barandabhar	71.44	245150	3057340	
	Sub Total	729.38			
1	Barandabhar Forest Area	71.44	246986	3056120	
	Total	800.83			

Annex 7: Location of Other Important Sites

S.N.	Name	Location	X_Coordinate	Y_Coordinate	Remarks
1	Elephant Breeding Centre	Khorsor	249551	3053461	
2	Wildlife Hospital	Sauraha	253261	3052454	
3	NTNC-BCC	Sauraha	252973	3052463	
4	Bikram Baba Temple	Kasara	237192	3050256	
5	Tigr Case	Kasara	237402	3050392	
6	Vulture Breeding Centre	Kasara	237357	3050531	
7	Ghariyal Breeding Centre	Kasara	237226	3050547	
8	Kasara Hattisar	Kasara	236898	3050455	
9	Wildlife Rescue Centre	Devnagr	245167	3056622	
10	Jatayu Resturant	Kawasoti	219143	3058079	Namuna BzCF

Annex 8: Location of Entry Points of CNP

S.N.	Entrance Points	Category	Management by	X_Coordinate	Y_Coordinate	Remarks
1	Laukhani	Range Post	Park	221045	3060190	
2	Amaltari	Sector Office	Park	213875	3052340	
3	Kujauli	Range Post	Park	227524	3063040	
4	Khagendramalli	Range Post	Park+Army	266669	3050390	
5	Sunachuri	Range Post	Park+Army	276465	3047500	
6	Sauraha	Sector Office	Park+Army	253109	3052380	
7	Ghatgain	Post	Park+Army	239407	3050770	
8	Bagai	Sector Office	Park+Army	248624	3035390	
9	Meghauli	Range Post	Park+Army	225321	3053130	
10	Bankatta	Range Post	Army+Park	231219	3045840	
11	Raptipool Gate	Post	Park+Army	235002	3050700	

Annex 9: Details of Solar Boring Installation in CNP

S.N.	Places	Near Posts	Longitude	Latitude	Remarks
1	Ghadial Breeding Centre	Kasara	237139	3050543	
2	Dumariya	Dumariya	244889	3050440	
3	Chisapani Pokhari	Sukhibhar+Budhirapti Phanta	226631	3049564	
4	Kasara Pokhari I	Barandabhar	236032	3050009	
5	Kasara Pokhari II	Barandabhar	236125	3050061	
6	Arna Enclosure	Sauraha	252679	3048889	
7	Hattisar Kasara	Kasara	236863	3050453	

Reference

CNP 2018. Management Plan of Chitwan National Park and its Buffer Zone (2075/76-2079/80), Chitwan National Park Office, Kasara, Chitwan.

CNP. 2016. Grassland Habitat Mapping in Chitwan National Park. Chitwan National Park, Kasara, Chitwan