२०६८।११।१३

पत्रोत्तरमा पत्र संख्या मिति उल्लेखित हुन अपेक्षित छ ।

नेपाल सरकार

वन तथा वातावरण मन्त्रालय

योजना, अनुगमन तथा समन्वय महाशाखा

(कार्यक्रम तथा योजना शाखा)

EX: पो. ब. नं. : ३९८७
सिंहदरबार, काठमाण्डौ

पत्र संख्या २०७७/७८/योजना
चलानी नं. :-२३४
प्राप्त पत्र संख्या र मिति :-

मितिः २०७७।११।०९

विषयः भानुभक्त प्राणी उद्यानको गुरुयोजना स्वीकृत सम्बन्धमा ।

श्री राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग,
बबरमहल, काठमाण्डौ।

प्रस्तुत विषयमा तहाँ विभागबाट पेश भएको भानुभक्त प्राणी उद्यानको गुरुयोजना स्वीकृत सम्बन्धमा वातावरण संरक्षण ऐन, २०७६ र वातावरण संरक्षण नियमावली, २०७७ बमोजिम वातावरणीय अध्ययन प्रतिवेदन स्वीकृत पश्चात मात्र कार्यान्वयन हुने गरी स्वीकृत भएको ब्यहोरा वन तथा वातावरण मन्त्रालय (मा. मन्त्री स्तर) को मिति २०७७।११।०५ को निर्णयानुसार अनुरोध छ ।

(राजु गुरुङ्ग)
सहायक भू संरक्षण अधिकृत

Master Plan
of
Bhanubhakta Zoological Garden
Chhirkan, Tanahun, Nepal

Submitted to:
Bhanubhakta Zoological Garden Office
Chhirkan, Tanahun
Gandaki Province, Nepal

Submitted by:
Green Era Pvt. Ltd.
Attaria, Kailali, Nepal
Jv
Rural Infrastructure Development Consultants (RIDC)
Kathmandu, Nepal

Exhibit & Display area has been completely isolated from other thematic areas within the project boundary and covers the sites of Agleraha, Dovan, Naubise, Dumre, Bhalukhola, Simle, Fatyadihi, Hattibandhne Dhunga. It is planned for providing similar habitat spaces for different species of wildlife along with the required services, amenities and facilities. Allocation of enclosures for different species of wildlife has been planned in several sections according to approved guideline of World Association of Zoo and Aquarium (WAZA). The area is purposed with different species of Herbivores, Carnivores and Omnivores. Moreover, rock garden, view tower, animal kitchen, etc. are also purposed. The area is further divided into eight sections a) Herbivores, b) Mega herbivores, c) Carnivores, d) Bear, e) Avifauna, f) Herpetofauna, g) Small Mammals (porcupine, mongoose & other burrowing animal) and h) Omnivores section. A central kitchen is also proposed which will overlook all other kitchens.

A separate peace and meditation area has been proposed near to Dunde and Ramthunki sites for peaceful, calm and quite place. However, it's closer to second entrance and will be easily accessible by small vehicles. A significantly large hall for the meditators will be available equipped with required facilities such as meditation yurts, garden, café/restaurants and guard house.

Similarly, Rescue & Research area is proposed in Simle and Bojhe sites for the rescue, orphanages and problem animals. Holding centre, quarantine centre and isolation centre are develop and rehabilitate them to their respective habitat. Likewise, research centre is established to conduct the research for the wildlife species and their characteristics to the students as well as any institutions. On the other hand, minimal intervention will be done in conservation zone. Fire line, forest road, patrol path and similar infrastructures will be constructed to control forest fire and supervise the area.

The master plan is envisaged different thematic plans to be implemented within a planning horizon of 20 years comprising three phases. The first phase is proposed mostly for the construction of the office areas, fencing, basic physical infrastructures (roads, water supply, electricity, enclosure etc.) and major parts of four areas around ZG. The second phase includes the facilities in the zones and construction of the remaining zones where as third phase comprises mostly for the repair and maintenance and the continuation of activities related to ZG. The master plan also includes the projection of the basic feasibility parameters like revenue, rate of return and cost benefit analysis. A basic business plan focusing income from different facilities and expenditure for various activities has been developed striving to provide unique and personalized best quality services to its visitors, promote internal and external tourism but more focus of domestic tourists, enhance socio-economic value to the community and conservation and protection of environment.The projected cost before the implementation of the master plan is NRs1,09,00,00,000 (In Words One arba nine corer only). Similarly, the expenditure in different particulars projected for 20 years is NRs 4,32,16,68,794 (In Words Four arba thirty two corer, sixteen lakhs sixty eight thousands seven hundred and ninety four only), whereas the income estimated is about NRs 7,39,65,53,790 (In Words Seven arba thirty nine corer, sixty five lakhs fifty three thousands seven hundred and ninety only. So the net benefit value after compiling all cost and projected income is NRs 3,07,48,84,996 (In Words Threearabseven corer forty eight lakhs eighty four

सारांश

वन तथा वातावरण मन्त्रालय, राष्ट्रिय निकुञ्ज र वन्यजन्तु संरक्षण विभागले सर्वसाधारणलाई शैक्षिक, आध्यात्मिक र मनोरन्जनका अवसरहरू प्रदान गर्दै वन्यजन्तुहरूको संरक्षण गर्न सहयोग पुऱ्याउने उद्देश्यका साथ गण्डकी प्रदेशको तनहुँ जिल्ला अर्न्तगत भानु न.पा. वडा नं. ११, १२ र ब्यास न.पा. वडा नं. ५, ६ को भूभागलाई समेटेर भानुभक्त प्राणी उद्यान (Bhanubhakta Zoological Garden) स्थापनाको योजना अगाडि बढाएको छ।

नेपाल सरकारले करिब ४२५ हेक्टर क्षेत्रलाई प्राणी उद्यानको रुपमा विकास गर्न राजपत्रमा सूचना प्रकासित गरेको छ। प्राणी उद्यान क्षेत्रको चारकिल्ला पूर्वमा छिर्कने भञ्ज्याङ्ग-जौवारी गाउँ जाने बाटोको केही भाग हुदै पोखरी भञ्ज्याङ्ग हुँदै ठाडो बाटो हुँदै वनतर्फको बाटो भएर राई खोल्सी भएर जौवारी जाने मुख भएर गखर्क डाँडा हुदै चालिसे खोला, शिसा खोलाभएर गरम भञ्ज्याङ्ग पर्दछ। पश्चिममा मोतीचौतारा हुदै कटहरे फाँट, तिनपाते डाँडा, ढकाल नदी, भूमिटार गाँउ, साठी मुरे खोलाहुदै भञ्ज्याङ्गचौतारा पर्दछ। त्यसैगरी उत्तरमा गरम भञ्ज्याङ्गदेखि नाब्रुंग जाने कच्चीबाटो भन्दा दक्षिण हुदै नावरुंगको आवादी भएर खोल्सी, वगुवा गाउँ, नेपाल डाँडाको आवादी, सिम्ने खोला ठाडोबाटो भएर भालुखोला, भञ्ज्याङ्गचौतार रहेको छ। दक्षिणमा छिर्कने भञ्ज्याङ्गदेखि पृथ्वी राजमार्ग, देउरालीको आवादी छेउ हुदै मोतीचौतारादेखि कटहरे फाँट सम्म रहेको छ।

यस प्राणी उद्यानको धेरै जसो क्षेत्र सरकारी वन तथा केही भाग नीजि आवादीभित्र पर्दछ। सरकारी वन अन्तर्गत ८ वटा सामुदायिक वन र ५ वटा कवुलियती वन पर्दछन्। नीजि क्षेत्रको आवादीलाई पनि अधिग्रहणको आवश्यक प्रक्रिया अगाडि बढिरहेको छ। यो क्षेत्र उपोष्ण प्रकारको वन अन्तर्गत पर्दछ। यस क्षेत्रमा साल, असना, सिमल, हर्रो, बर्रो आदी जस्ता वनस्पतीका प्रजाती पाईन्छन् र वन्यजन्तुमा गोल्डेन स्याल, बंगाल फ्याउरो, हरिण, बाँदर, कालिज, मैनाहरू आदि प्रजातिहरु पाईन्छन्।

प्राणी उद्यानको समग्र क्षेत्रलाई मुख्यतया उपयोगी र संरक्षण गरी २ भागमा वर्गीकरण गरिएको छ। उपयोगी क्षेत्रलाई पनि भूवनोट, पहुँच, भिरालोपना, लागत तथा वन्यजन्तुलाई पर्ने बाहिरी प्रभावजस्ता सुचकहरुको आधारमा प्रशासनिक, प्राणी प्रदर्शन, अनुसन्धान तथा प्राणी उद्धार र शान्ति तथा योगा क्षेत्र गरी विभिन्न ४ क्षेत्रमा विभाजन गरिएको छ भने संरणक्ष क्षेत्रलाई प्राकृतिक रुपमै वन्यजन्तुको लागि आवश्यक पर्ने आहारा उत्पादन क्षेत्रको रुपमा विकास गर्ने गरी विभाजन गरिएको छ।

प्राणी उद्यानका प्रमुख ४ क्षेत्र मध्ये प्रशासन क्षेत्रलाई कार्यालयको प्रवेशद्वार नजिकै राखी प्रशासनिक गतिविधिका लागि मुख्य कार्यालय भवन, टिकट काउन्टर, कर्मचारी आवास गृह, क्याफे, शैक्षिक केन्द्र, सूचना केन्द्र आदि संरचना वनाउने योजना रहेको छ भने खुल्ला स्थानहरुलाई वाल उद्यान, सार्वजनिक एवं हरियाली क्षेत्रको रुपमा विकास गरिने छ।

प्राणी प्रदर्शनी क्षेत्रलाई अन्य विषयगत क्षेत्रहरुबाट पूर्ण रूपमा अलग राखिएको छ जसले गर्दा प्रशासनिक क्षेत्र र यसको बीचमा प्रत्यक्ष रुपमा प्रतिकुल प्रभाव नपरोस र आगन्तुक वा पर्यटकले पनि सहज रुपमा अवलोकन गर्न सकियोस। यस क्षेत्रलाई विभिन्न प्रजातिका प्राणीहरुको वासस्थान

र तिनीहरुको सुविधाका लागि आवश्यक भौतिक संरचनाको योजना बनाईएको छ । विभिन्न प्रजातिका वन्यजन्तुको आआफ्नै स्वभाव हुने भएकोले सो कुरालाई ध्यानमा राखी यस क्षेत्रलाई अन्य ८ उपक्षेत्रमा विभाजन गरिएको छ ।

शान्ति तथा योगा क्षेत्र अन्तर्गत वृहत हल, हरित वगैचा, क्याफे आदि संरचना निर्माण गर्ने लक्ष्य राखिएको छ । अनुसन्धान तथा प्राणी उद्धार क्षेत्रमा प्राणी अनुसन्धान कक्ष, विभिन्न प्राणीहरुको उद्धार सहित समस्यामा परेका जनावरहरूको लागि वासस्थानको रुपमा प्रस्ताव गरिएको छ । यसका साथै होल्डिङ्ग सेन्टर, क्वारेन्टाइन र आईसोलेसन सेन्टर विकास गरी पुनःस्थापना गर्ने लक्ष्य लिईइको छ ।

२० वर्षे समयावधि र करिब ३ चरणमा कार्यान्वयन गर्ने गरी यस प्राणी उद्यानको गुरुयोजनामा विभिन्न विषयगत योजनाहरु समेत समेटिएका छन् । पहिलो चरणमा मुख्यतयाः प्रशासनिक भवन लगायत आधारभूत भौतिक पूर्वाधार (सडक, पानी आपूर्ति, बिजुली, टेलिफोन) र विभिन्न लिंक रोडहरु निर्माणका लागि प्रस्ताव गरिएको छ । दोस्रो चरणमा भौतक पुर्वाधारका संरचना निर्माण गर्ने योजना समावेश गरिएका छन् । तेस्रो चरणमा प्रायः मर्मत सम्भार र प्राणी उद्यानका नियमित कार्यहरु अगाडि बढाउन आवश्यक पुर्वाधार निर्णाण, मर्मत सम्भारका योजनाहरु समावेश गरिएका छन् ।

यस गुरुयोजनामा समग्र प्राणी उद्यानको विकास लागि २० बर्ष अबधिमा बिभिन्न संरचनाहरुको निर्माण र सञ्चालनको लागत र संञ्चालनबाट प्राप्त आम्दानीको प्रक्षेपण सहित व्यवसायिक योजना तयार गरेको छ जसले आन्तरिक तथा वाह्य पर्यटकको सुविधा, प्राणी उद्यानले गर्ने गुणस्तरीय सेवाहरू, प्राणी उद्यानका भौतिक संरचना र आर्थिक सामाजिक तथा वातावरणीय पक्ष साथै प्राणीहरुको सुरक्षालाई वढि प्राथमिकतामा राखिएको छ ।

व्यवसायिक योजना अनुसार यस प्राणी उद्यानको २० वर्षको कुल लागत रु. ४,३२,१६,६८,७९४ (अक्षरुपी चार अर्व वत्तिस करोड सोह्र लाख अठ्सट्टि हजार सात सय चौरानव्वे मात्र) र कुल आम्दानी रु. ७,३९,६५,५३,७९० (अक्षरुपी सात अर्व उनान्चालिस करोड पैसट्टि लाख त्रिपन्न हजार सात सय नब्वे मात्र) रहेको छ । सम्पूर्ण खर्च तथा आम्दानीको लेखाजोखा गर्दा यस २० वर्षे परियोजनाले योजना अवधिमा रु. ३०७४८८४९९६ (अक्षरुपी तीन अर्व सात करोड अठ्चालिस लाख चौरासी हजार नौं सय छयानब्बे रुपैयाँ मात्र) मुनाफा सहित करिव १२ वर्षमा प्रतिफल दिने देखिन्छ ।

यस प्राणी उद्यानलाई मुख्यतया संरक्षण, समस्याग्रस्त प्राणीहरुको उद्धार र आन्तरिक तथा बाह्य पर्यटकलाई अनुसन्धान तथा मनोरञ्जनको सुविधा उपलब्ध गराउने लक्ष्यका साथ यो गुरुयोजना तयार गरिएको छ । यस योजनाको कार्यविधी तथा कार्यान्वयन प्रक्रिया विस्तृत परियोजना प्रतिवेदन (DPR) तयार गरी सो को प्रमाणित भएको अवस्थामा संघिय, प्रादेशिक वा स्थानीय स्तरमा वा सार्वजनिक निजी साझेदारी रुपमा संचानल गर्ने भन्ने निर्णय गर्न सकिन्छ ।

ABBREVIATIONS AND ACRONYMS

BZG	Bhanubhakta Zoological Garden
CBSG	Conservation Breeding Specialist Groups
CCTV	Closed-circuit television camera
CFUGs	Community Forestry User Groups
CZ	Central Zoo
DNPWC	Department of National Parks and Wildlife Conservation
DPR	Detail Project Report
EAZA	European Association of Zoo and Aquarium
EU	European Union
FGD	Focus Group Discussion
FT	Foot Trail
HDI	Human Development Index
IUCN	International Union for Conservation of Nature
KII	Key Informant Interview
KMTNC	King Mahendra Trust for Nature Conservation
LPCD	Liter Per Capita per Day
MOFE	Ministry of Forest and Environment
MR	Main Road
NGO	Non-Government Organization
NTNC	National Trust for Nature Conservation
RvT	Reservoir Tank
Spp.	Species
SR	Service Road
SSC	Species Survival Commission
ToR	Terms of Reference
WAZA	World Association of Zoo and Aquarium
WWF	World Wildlife Fund for Nature
ZG	Zoological Garden
ZSL	Zoological Society of London

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PART – I

Context

CHAPTER 1: INTRODUCTION

1.1 Concept:

Zoological Garden (ZG) is a geographical space that poses collection of wild fauna and flora of one or more species so that they are easy to see and study in their natural habitats. The objective of such ZG is to support for the conservation of various wildlife species *in-situ* and *ex-situ*, which will protect the natural habitats and balance their ecosystems. It offers support and facilities in order to increase scientific knowledge that will benefit conservation as well as ecosystem management, and provides habitats for injured, orphan and problem animals. It also helps to promote public and political awareness of the necessity for conservation in addition to ecosystem management, natural resource sustainability and continuation of co-existence between human and animal. Similarly, such ZG is expected to act as a hub for recreational centers that cater service to meet aspirations of people for recreation and amusement.

The various functions of ZG have evolved over the time. The primary objective of the Zoo, Zoological Park (globally known as) and ZG (nationally) is similar. While a ZG is solely dedicated to the display and care/growth of species and often designed to preserve and grow various species of fauna along with providing ample space for recreation but the park comprises of constructed structures designed for entertainment purpose with priority (Nagayach, 2017). Various directives and guidelines have been produced for keeping wild fauna with the objective of protection and conservation. These directives introduced a legal framework for biodiversity conservation in zoos. These directives help improve husbandry standards and professional competence in zoos, as well as contributing to scientific research and to the conservation of the global biodiversity.

Specifically, the World Association of Zoo and Aquarium (WAZA), European Association of Zoo and Aquarium (EAZA) prepared a policy regarding to protect wild fauna to conserve biodiversity. The European Union (EU) also plays a valuable role in the conservation of biodiversity, especially in relation to the measures to be adopted regarding *ex-situ* conservation (European Commission, 2016). The IUCN guidelines also provide fundamental information on the management of *ex-situ* populations, reintroduction, translocation and other species conservation issues. Likewise, the IUCN Species Survival Commission (SSC) includes specialist groups of experts, who provide research and information on a wide variety of topics from those related to specific taxa to animal health or conservation in-situ. Particularly, the Conservation Breeding Specialist Group (CBSG) provides tools, information and communication to facilitate integration of *ex-situ* and *in-situ* activities.

In Nepal, present Central Zoo at Jawalakhel, Lalitpur was established by late Prime Minister Juddha Sumsher J.B, Rana in 1932 (1989 BS) as a private zoo. This was the first zoo in the country and it came under the government management in 1951 and was opened to public in 1956 only. After the collapse of Rana Regime, the zoo has managed by various departments of the government. Later, in 1980, management responsibility of this zoo was given to the Department of National Parks and Wildlife Conservation under the Ministry of Forests and

Environment. In 1995, Government of Nepal handed over the management of the Central Zoo to National Trust for Nature Conservation (NTNC) for managing it at the international standard. Then after, lot of improvement of zoo facilities for keeping animals, birds and reptiles and other recreational and animal health care centers have been developed. Now, this zoo is equipped with animal hospital for taking care of the zoo animals as well as of orphan, problem and rescued animals. The zoo management also provides rescue operation for wild animals. Now, there are several small zoos established in different parts of the country with limited number of wildlife species.

Since there was no specific legislation to manage zoos in the country, Fifth Amendment of the National Parks and Wildlife Conservation Act 2029 BS (1973) done in 2017 make the provision of establishment and management of Zoo including Zoological ZG in the country. The Zoo has been defined as "A place where wildlife is exhibited in *ex-situ* for the purpose conservation education, recreation, breeding, conservation of genetic resources, study and research, and it shall also denote Zoological Garden established as per the international norms." The amended act has also provisioned for the establishment of Wildlife Rescue Center and Animal Hospital.

The Government of Nepal approved the creation of Suryabinayak National Zoological Garden with an area of 245.165 hectare at Suryabinak in Bhaktapur district on February 13, 2015.The foundation of the ZG was laid by the Rt. Hon. Prime Minister K.P. Oli on June 23, 2016 for moving forward the initiative. The ZG, now, is under construction phase. In the meantime, a "National Zoological Garden Center Management Guideline, 2072 BS (2015) has been approved at ministerial level under the Ministry of Forests and Environment for facilitating the construction, management and outsourcing financial resources required for the ZG.

The Government of Nepal has made decision through Budget Speech of the Fiscal Year 2016/2017 in commissioning feasibility study for establishing one Zoological Garden in each State of the country. As a part of follow up of the Budget Speech and on the request from community of Tanahu district, Ministry of Forests and Environment commissioned a six members Team under the leadership of Chief of the Planning Division on December 19, 2016 for the feasibility study of establishing Zoological Garden in the district. The Team submitted a feasibility study report on establishing Zoological Garden on January 22, 2017. The Government, on February 2, 2017, made decision based on the recommendations of the Team to establish Bhanubhakta Zoological Garden in Tanahu covering an area of 425 hectares. The ZG includes parts of forests of eight Community Forests, five Leasehold Forests and National Forest and settlements, unregistered land and streams.

CHAPTER 2: APPROACH AND METHODS

The methodology is fundamentally guided by the Terms of Reference (TOR). However, the methodology has been revised after the field visit. Both rational and participative methods is used, the direct observation/investigation and the interpretation of the existing documents. Program planning and conceptual design of the master plan has been complemented by stakeholders' opinions and suggestions. In short, master plan has included but not restricted to the mixed method that involves rational and participatory. Using rational method, consultant had prepared the base map, carried out the physical study and investigation of the site. A socio-economic study of the surrounding areas of the ZG and a case study of Central Zoo has been conducted. A preliminary conceptual master plan is prepared with the inputs from several experts from interdisciplinary institutions. The plan thus prepared and presented to concerned stakeholders from project municipalities and local representatives and the client. The plan was revised to incorporate the suggestions made during the consultation meetings to prepare final master plan. Similarly WAZA Code of Ethics and Animal Welfare and rules and regulation related to animal welfare are also followed.

2.1 Approach

- **Coordination and consultation**

Coordination and consultation approaches and activities have been accomplishing the task of master plan preparation. Multi-stakeholder consultations, coordination and meaningful interactions with key players and relevant stakeholders has carried out at central, district and local levels for collecting different perspectives, aspirations, expectations and commitments. Socioeconomic and demographic information has been verified using local key personnel through key informant survey. All the data processed into information and results has been validated after consulting with all project team members, experts, and concerned stakeholders. The final draft report is shared to the local level and national level. The opinions, suggestions, knowledge, views and ideas were reflected and discussed continuously to translate them into the strategic elements of the document especially vision, goals, strategies and activities of the master plan.

- **Participatory and Inclusive**

Designing and implementing result-based, participatory, inclusive interactive approaches and activities have been carried out. Latest and relevant literature on environment and protection, wildlife, policies related to Zoological Garden, guidelines for engineering design etc. has reviewed in a systematic manner and appropriate checklists for focus group discussion, key informant interview and questionnaires has prepared to conduct consultation and interactions for gathering information with representing from all level, caste and groups.

2.2 Methods

2.2.1 *Literature Review*

The study team accessed, reviewed and analyzed published and unpublished reports and documents relevant with this study such as master plan and management plan of protected

areas, Zoological and Botanical Garden, Park and greenery sites, protected forest management plan, periodic plans and annual plans, landscaping, infrastructure planning and biodiversity related documents and reports to enrich the study and to make broader understanding of the Master Plan. Moreover, documents published by the DFO, Bhanu and Byas Municipality and so on were also reviewed for this study. The information regarding the climatology, geology, meteorology, hydrology, etc. of the specific site have been collected. The cadastral map, GIS map, Google map, satellite images and other data relevant to design of building and further planning of the survey works and site investigation works were collected and studied.

- **National Park and Wildlife Conservation Act (1973) and Regulations:**

Nepal embarked upon a modern era of wildlife conservation with the enactment of NPWCA, 1973. Section 3 of this Act empowers the GoN to establish Protected Areas (PAs) such as national parks, wildlife reserves, hunting reserves, conservation areas and buffer zones in any part of the country through a gazette notification. Likewise, the Act allows the government to withdraw from the PAs, to hand over the ownership or change the boundaries through similar notifications.

- **World Association of Zoos and Aquariums (WAZA)**

WAZA's vision is a world where zoos and aquariums maximize their conservation impact. Zoos and aquariums are at the fore-front of conservation efforts and comprise the largest global conservation network. WAZA promotes cooperation between leading zoos, aquariums, national and regional associations, as well as with leading wildlife experts, academies, and universities. WAZA provides support for species-conservation management and husbandry of animals in human care, while encouraging the highest standards in member institutions. WAZA has formed partnerships with leading international conservation organizations, committing its members to tackle global issues such as the illegal wildlife trade, coral-reef restoration, marine litter, sustainable palm oil and climate change.

The Code of Ethics and Animal Welfare was prepared on the basis of the 1999 Code of Ethics and the 2002 Code of Animal Welfare. It was adopted at the 58th Annual Conference of WAZA on 19 November 2003 in San José (Costa Rica).

Principles

- Assisting in achieving the conservation and survival of species must be the aim of all members of the profession. Any actions taken in relation to an individual animal, e.g. euthanasia or contraception, must be undertaken with this higher ideal of species survival in mind, but the welfare of the individual animal should not be compromised.
- Promote the interests of wildlife conservation, biodiversity and animal welfare to colleagues and to society at large.
- Co-operate with the wider conservation community including wildlife agencies, conservation organizations and research institutions to assist in maintaining global biodiversity.

- Co-operate with governments and other appropriate bodies to improve standards of animal welfare and ensure the welfare of all animals in our care.
- Encourage research and dissemination of achievements and results in appropriate publications and forums.
- Deal fairly with members in the dissemination of professional information and advice.
- Promote public education programs and cultural recreational activities of zoos and aquariums.
- Work progressively towards achieving all professional guidelines established by the WAZA.

o **European Association of Zoos and Aquaria (EAZA)**

EAZA's mission is to facilitate cooperation within the European zoo and aquarium community towards the goals of education, research and conservation. EAZA's believe that zoos and aquaria have a strong role to play in protecting nature and wildlife both at institutions and out in the field, by:

- Providing funding and manpower to *in situ* conservation projects aimed at protecting animal populations and their habitats
- Maintaining viable populations of animals in human care to ensure their survival over the long term
- Educating our visitors about animals and their habitats and providing them with the knowledge and opportunities they need to live sustainably as part of nature
- Researching all aspects of animal biology to improve our understanding of animals and how they live and interact

o **Zoological Society of London (ZSL)**

With the vision of a world where wildlife thrives the propose of the ZSL is to inspire, inform and empower people to stop wild animals going extinct. To tackle the threat to wild animals and help people achieve this positive change, ZSL will:

- Inspire future generations through amazing experiences with animals, giving them a lifelong connection to wildlife and an understanding of the part that they can play.
- Inform the world about the challenges facing wildlife and the ways we all can address these, based on our scientific research, experience and expertise.
- Empower communities, leaders and influencers by giving them methods, evidence and tools to enable people and wildlife to thrive together.

Role of Conservation in Zoos

The role of the zoo has evolved to prioritize research, education, and conservation. Some people still condemn the existence of zoos based on its past life of pure entertainment. It is true that zoos started as menageries and amusement parks, but they have come a long way since the late 1800s. Currently, laws protect wild animals and guarantee their welfare

(e.g., Animal Welfare Act, Endangered Species Act, Marine Mammal Protection Act). Accreditation bodies make sure zoos and aquariums offer great care for their animals. Zoos have an essential role in conservation.

- ***Design Consideration***

Classification of Zoos: For the purposes of deciding standards and norms for recognition of Zoos and monitoring and evaluating their performance, the zoos, on the basis of the area, number of animals and their variety exhibited, and the number of visitors, are classified into four categories as specified below:

Table 1: Classification of Zoo

Category of the Zoo	Large	Medium	Small	Mini
Area of the zoo in hectares	More than 75 hectares	50-75 hectare	20-50 hectare	Less than 20 hectare
Number of animals exhibited	More than 750 numbers	500-750 numbers	200-499 numbers	200 numbers
Animals variety exhibited	More than 75 numbers	50-75 numbers	20-49 numbers	20 Numbers
Number of endangered species exhibited	More than 15 numbers	9-15 numbers	5-9 numbers	Less than 5 numbers
Annual attendance of visitors per year	More than 7.5 lakhs	5-7.5 lakhs	2-5 lakhs	Less than 2 lakhs

Source: Zoo/Wild animal breeding, management, nutrition and healthcare

2.2.2 *Case Studies*

To understand the basic essentials of the Zoological Garden design, several case studies were carried out. Among them, the Central Zoo of Kathmandu, and Singapore Zoo are explained as follows:

- **Singapore Zoo**

The Singapore Zoo, formerly known as the Singapore Zoological Garden and commonly known locally as the Mandai Zoo, occupies 28 hectares which house 315 species including white tiger, Sheba, and Inuka) on the margins of Upper Seletar Reservoir within Singapore's heavily forested central catchment area. It is the first zoo in Singapore founded in 1875 and it has a rainforest Kidz world and a fragile forest. The main function this zoo performs relates to the morning hour activities when visitors can enjoy watching the activities of the morning active animals and birds and Safari activities in the evening. The key features of this zoo are as follows:

- The zoo is "open concept" in which the animals are housed in open enclosures landscaped to resemble their natural habitats.
- The zoo currently receives over 1.7 million visitors each year and is now home to over 2,800 animals representing more than 300 species, of which 26 percent are threatened.

- The zoo has scored a number of successes in the breeding of critically endangered species and has, over time, established itself as one of the best rainforest zoos in the world.
- The main attractions of the zoo are its 11 theme-based zones. Each zone features the unique interactions and relationships among the different plant and animal species with their environment.
- The 11 zones are Frozen Tundra, Wild Africa, Fragile Forest, Australian Outback, Great Rift Valley of Ethiopia, Treetops Trail, Gibbon Island, Primate Kingdom, Reptile ZG, Critters Longhouse, as well as the Tropical Crops & Orchid ZG.

Unique Exhibits:

- ***The Iconic Waterfall Aviary***

The iconic Waterfall Aviary is the zoo's largest walk-in aviary with over 600 free-flying birds from 50 species, including the endangered sun conjures, common crowned pigeons, and Von der Decken's hornbills. This aviary houses a 30 meter high waterfall which is the world's first and tallest man-made waterfall. Today, it is the tallest waterfall inside an aviary. Visitors can expect close encounters with these birds during daily feeding sessions. With a collection of over 500 birds representing 135 species, the revamped Wings of Asia aviary houses the largest diversity of birds in the zoo. It is home to one of the world's most comprehensive and admired collections of Asian birds, including 24 threatened species such as the Bali mynah, Luzon bleeding-heart dove, and black-winged starling. These species have been successfully hatched and raised as part of the park's on going conservation breeding programmes.

- ***The Lory Loft***

The Lory Loftis the biggest Lory flight aviary at 3,000 square meter and nine-stories high. Featuring nine colourful species, this exhibit is themed after the Australian outback and is popular among visitors who get to feed Lories and lorikeets with a cup of nectar mix while walking across suspended bridges.

- ***Penguin Coast***

Penguin Coast home to 100 penguins across five species is divided into indoor and outdoor exhibits. The indoor, climate-controlled exhibit is home to the Humboldt, rockhopper, macaroni, and the majestic king penguin. Visitors can observe these birds as they torpedo through the water and jump up from the water onto the ice. The outdoor exhibit houses the endangered African penguins, otherwise known as jackass penguins, one of the few species that has adapted to the tropics.

- ***Pelican Cove***

Pelican Cove features the world's most complete collection of pelicans with seven out of eight species. The collection includes the Dalmatian pelican, the largest species weighing up to 15 kg. Visitors can catch the huge birds in action as they make their dramatic underwater swoops for fish at the world's first underwater viewing gallery for pelicans.

The Breeding & Research Centre provides a behind-the-scenes look at the growth process of birds from incubation to weaning. The center was incepted in 1988 but was officially opened for walk-in public viewing in 2012. By showcasing the work of avian keepers, it is hoped that visitors will walk away with a deeper appreciation of avian wildlife and the park's conservation efforts.

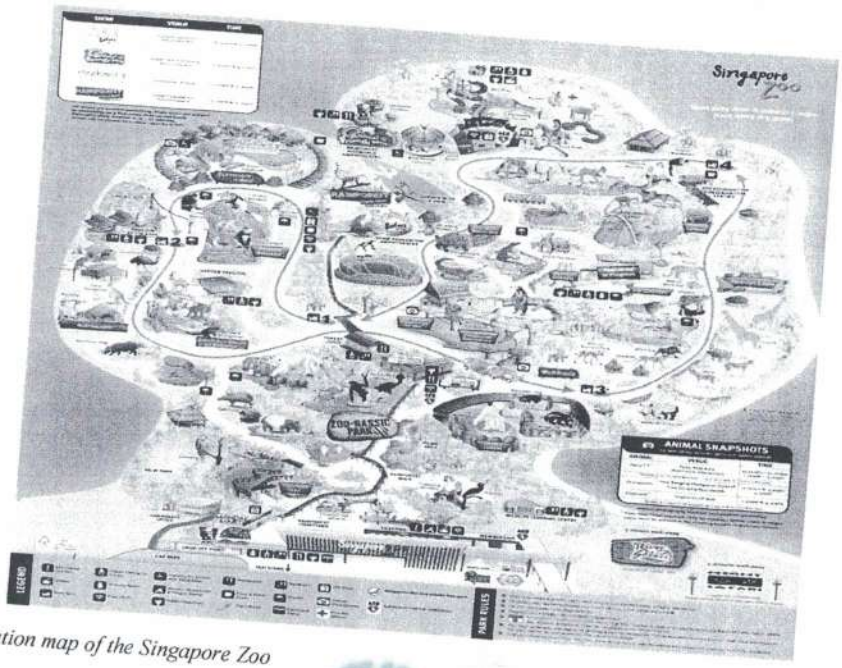


Figure 1: Information map of the Singapore Zoo

- **Central Zoo of Kathmandu**

Establishing protected areas alone is not enough to realize full conservation. Promotion of conservation education is only a potential key to enable people toward sustainable resource consumption. The zoo has its own place to achieve this goal. But a poor understanding of the people's demand and ecological issues is hindering progress in many places worldwide and the case of the zoo is no exception.

In this context, the Central Zoo (CZ) of Nepal covering an area of six hectares and located in Jawalakhel (Southern part of the Kathmandu Valley) provides facilities for viewing, studying, and preserving wildlife in captivity. Records have shown that about one million people visit the zoo annually *(Chaudhary1998)*. The zoo holds collection of fauna mainly threatened animals from the different ecological zone of Nepal and gifted by other institutions of the world. Notable collections include the Greater one-horned rhino, Royal Bengal tiger, Common Leopard, Garial crocodile, Himalayan black bear and hippopotamus. Since 1995 the National Trust Nature Conservation (NTNC) not for profit organization (which was established by the government with the legislative Act in 1982) is managing the Central Zoo.

The zoo is home to about 870 animals belonging to 109 species, including 15 endangered native as well as many animals from around the world including hippos, siamang, ostriches, and many birds. It also includes an aquarium for subtropical fish. Mammals at the zoo include Asian elephant, Assam macaque, barking deer, blackbuck, blue bull, common langur,

clouded leopard, porcupine, Himalayan black bear, Himalayan blue sheep, hippopotamus, jackal, jungle cat, leopard cat, Great one horned rhinoceros, Royal Bengal tiger, siamang, spotted deer, striped hyena, and wild water buffalo. Reptiles at the zoo include Aldabra tortoise, Burmese python and Asiatic Rock Python, Chinese alligator, common cobra, monitor lizard, gharial, and turtles. Birds at the zoo include African grey parrot, demoiselle crane, black-necked stork, black-headed ibis, budgerigar, dusky eagle owl, Eurasian eagle owl, steppe eagle, ostrich, bar-headed goose, grey heron, Himalayan griffon, kalij pheasant, red-headed vulture, sarus crane, Oriental pied hornbill, silver pheasant, white-napped crane, white pelican, white-eyed buzzard, sulphur-crested cockatoo, white stork etc.

Nepal government with motto to conserve endangered wild animals has decided to build the several zoological Gardens in the country. The first decision made was a zoo planned at Suryabinayak nearby the city in Bhaktapur. However, the project is still under construction phase. With inception of this zoological Garden, government has planned and produced several legal frameworks for biodiversity conservation to help improve husbandry standards and promote the conservation works.

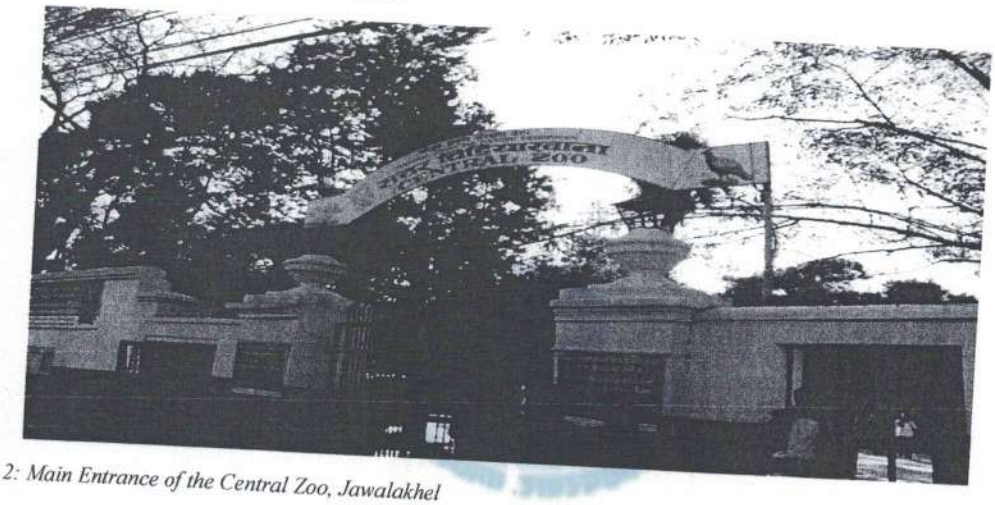


Figure 2: Main Entrance of the Central Zoo, Jawalakhel

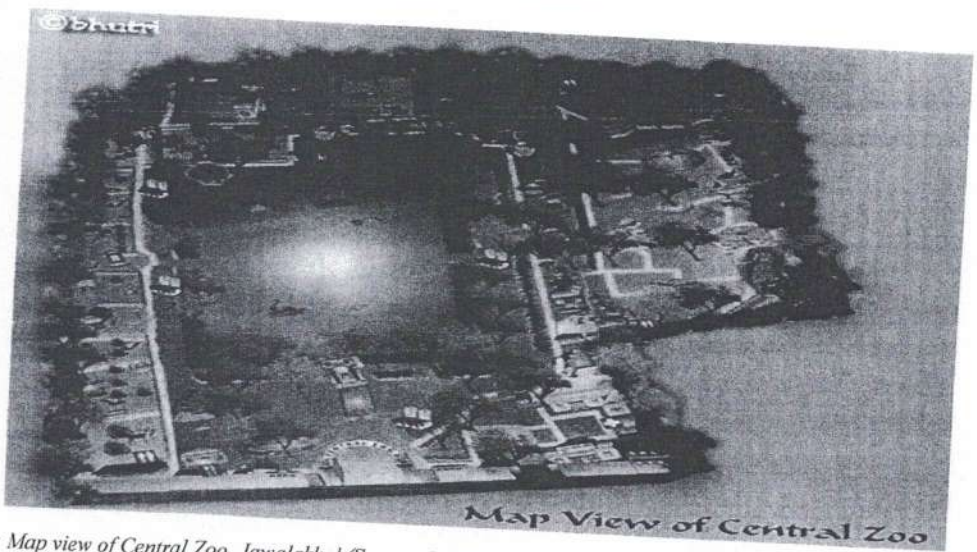


Figure 3: Map view of Central Zoo, Jawalakhel (Source: Internet, Photo by Bhutri)

- **National Zoological Garden, Suryabinayak**

National Zoological Garden in Suryabinayak, Bhaktapur is visited by team and reviewed the draft.

2.3 Reconnaissance

During the reconnaissance visit the main access options to the project site, the project layout and topographical survey boundary area, engineering hazards was studied. During this visit basic data regarding the existing religious and cultural sites were visited.

2.4 Field Survey

Field survey is carried out for both primary and secondary sources of data or information. Primary data are collected from different operational plan of community forest, leasehold forest. Similarly, information from district forest sector plan, municipalities profile and annual report were also reviewed and data from them are incorporated.

2.4.1 *Social Survey*

Focus Group Discussion and Key Informant Interview

The proposed master plan aims to adopt varied method that involves rational and participatory methods. Using rational method the expert team carried out the physical study and investigation of the site, a socio-economic study of the surrounding, case studies related to Zoological Garden and the data were collected through focus group discussion and key informant interview.

Figure 4: Public Consultation Workshop

2.4.2 *Topographical Survey*

The topographical survey of the BZG was carried out to get the detail information of the topography of that area. The topographical map should show the traverse lines, benchmarks reference lines and/or points with respect to which the present topographical map is prepared. The survey should also produce a map showing other important features and facilities in the surrounding areas including access roads, buildings, drainage, power supply, communication,

temple/cultural sites, historic buildings, disaster prone areas, water sources and water supply channel etc. Boundary Survey was done using Drone and competes with boundary map.

2.4.3 *Observation*

Various experts and teams have visited site for carry out the field investigations and data collection. The team conducted site investigations, topographic survey and geological investigation of proposed project area. During the field visit the main access options prepared during inception phase was studied further. Similarly a surface geological survey was made where suitable sites for construction works were identified.

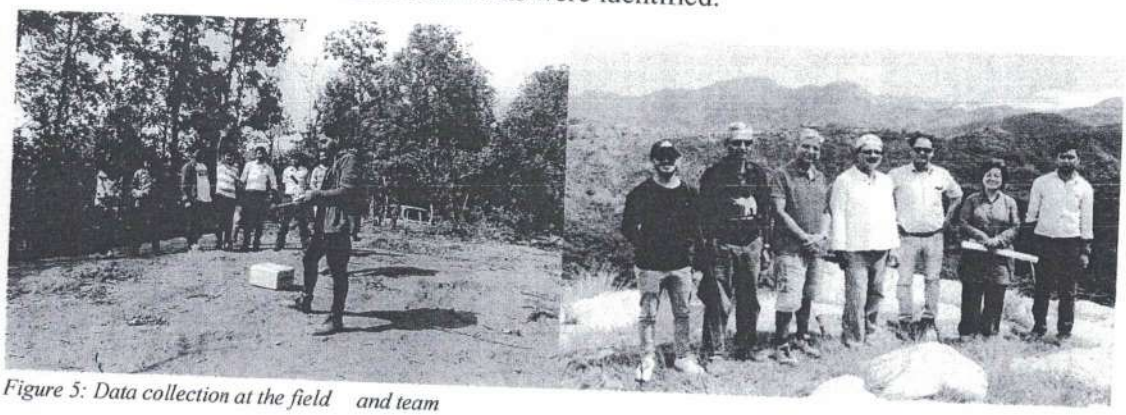


Figure 5: Data collection at the field and team

The team visited the site for carrying survey works. Initially, aerial survey was conducted by the team. Several ground control points were established during the survey works. A base map was prepared for the conceptual design of the Zoological Garden. After the conceptual planning a detail topographical survey was made. The methodology used for the entire survey works was developed as per the scope of works. The feature of terrain was surveyed. Every significant feature like riverbanks, landslides, cliffs, houses, roads, foot trails, boulders, rocks, school, Gully or Kholsi etc. were recorded.

The detail survey depicted following information on the ground:

- River or Stream
- Houses, Shed, Temples, etc.
- Boulders, Rock, Cliff, Landslides, Trees etc.,
- Tap, Water tank etc.
- Gullys or Kholsi etc,
- Road, Bridges, Tracks and Structures in the road etc.
- Agricultural, Forest Village Boundaries.
- School, Critical Area in Road and alignment and settlement beside road

Every data were properly processed and a map with topographical map of 0.5 m contour interval (Provided in Volume II) was development for further design works.

2.5 Consideration on Environment Protection

Environmental Consideration is considered since the beginning of the planning. Layout plan of the ZG surrounding is guided by environmental, physiographic and historical factors. The master plan preparation was mainly based on as less as destruction of existing wildlife

species during implementation of the project. The design of the master plan of ZG have incorporated environmental concepts such as avoiding/minimizing adverse environmental impacts, recycling or reusing and proper handling of wastes making optimal use of natural, health & safety as well as accident/emergency management measures. The unavoidable risks are mitigated through appropriate mitigation measures (technology, type of structures, management etc.). Appropriate suggestions are incorporated in the design for protection of surrounding environment.

2.6 Conceptual Planning and Design

Based on the collected information and results of the discussion, the detail master plan is prepared following the standard codes of practice, norms and guidelines. The relevant codes of IS for the design of Nepal National Building Code (NBC-1994) preexisted Municipality norms of the district. Rule and Regulation shall be followed. The list of all reference literature and materials is provided on the report. The final master plan of the ZG showing all the components and elements are prepared and provided along with the detail drawings of the elements and components allocated in the site.

2.7 Preparation of Specification and Quantity and Cost Estimate

The consultants have collected information on sources of materials and their lead distances and estimated the quantity based on the standard norms, conceptual architectural drawing and capacity. Tentative cost estimate is prepared for the whole tasks for design and construction using the all information.

2.8 Preparation and Sharing of Draft

With inputs based on the discussions from the experts, beneficiaries and the stakeholders including the project municipalities, the action plans were developed and a preliminary conceptual master plan was prepared. A presentation on the draft and overall findings were discussed and shared to respective municipalities and clients. The plan was revised to incorporate the suggestions and recommendations made during the consultation and presentation meetings. Two presentations were organized in the DNPWC including experts on zoo and related field and two presentations were organized in the Ministry with senior management team before final submission. All the comments and suggestions were incorporated in this plan.

2.9 Submission of Final Plan

Incorporating all the views of expert and their feedbacks, the draft report is finalized and submitted to client.

PART – 2

MASTER PLAN

CHAPTER 3 : EXISTING SITUATION

3.1 Project area description

3.1.1 *Location and Topography*

The proposed ZG site is situated in Tanahun district of Gandaki province of Nepal. It is located in Bhanu and Byas municipalities and precise its location is Latitude: 27° 59'13" N, Longitude: 84° 21' 16"E. The ZG covers the 11 and 12 ward of Bhanu and 5 and 6 ward of Byas Municipality The boundary of the ZG is as follows:

East : Way to Chhirkane Bhanjyang Jauwari Village - Pokhari Bhanjyang - Rai Kholsi - Chalise Khola - Shisha Khola and Garam Bhanjyang

West : Moti Chautara - Katahare Phant - Tin Pate Danda - Bhumitar Village - Sathimure Khola - Bhanjyang Chautara.

North : Mud road way to Nabrung and settalment - Baguwa village with Nepal Danda settlement, way to Bhanjyang Chautara through Simne khola and Bhalu Khola.

South : Chhirkan Bhanjyang through Prithvi Highway, Deaurali Settlement with Moti Chautara to Katahare Phant.

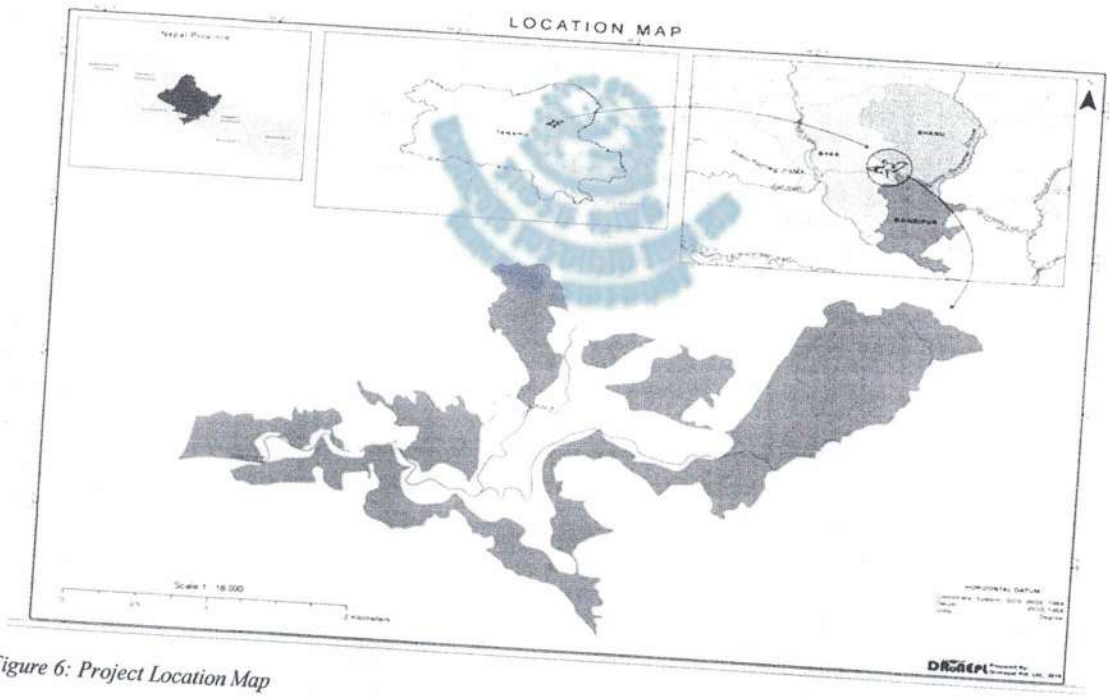


Figure 6: Project Location Map

The proposed ZG is situated on the alluvial deposits of two major streams Shisha Khola and Bhalu Khola, it is generally flat to moderately flopping with a natural meandering water body lying on the northern side. The topography of the site comprised is gentle slope to undulating and steep slope on hill tops. The elevation ranges from 450 m to 890 m.

3.1.2 *Slope and Aspect*

The slope of the proposed ZG is 0-57 degree however, the most of the area lies on 12-30 degree slope. Similarly the aspect of most of the area is northwest.

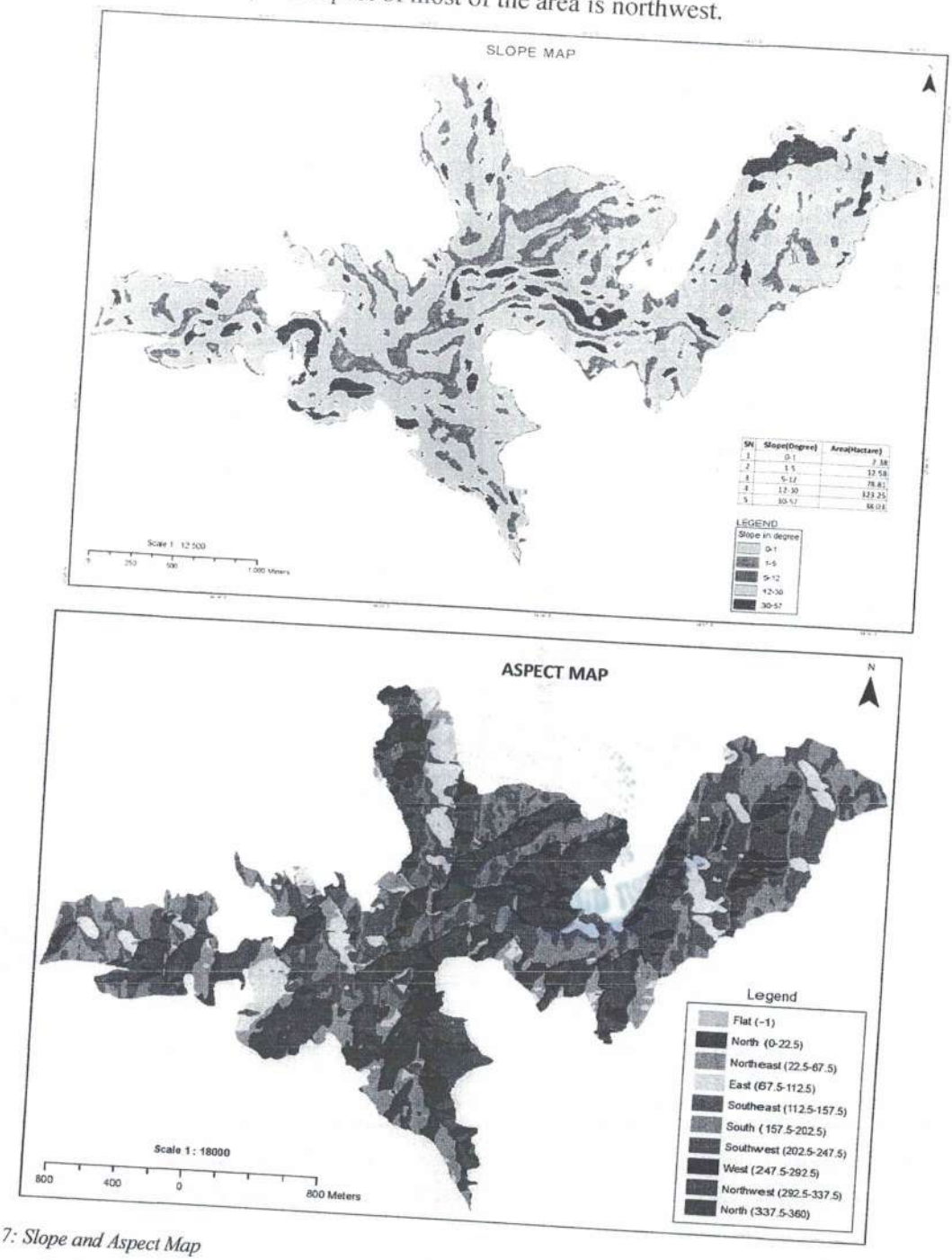


Figure 7: Slope and Aspect Map

3.1.3 *Land Use Area*

The government of Nepal has approved 425 ha area for the ZG that includes eight community forests, five leasehold forests and some parts of cultivated lands. Approximately, 87 % of total project area is covered by the forest, 11% by the cultivated land and 2% by the water

cover and remaining by settlement and road. Similarly, 93.71% of forest land is covered by community forest whereas leasehold forests contain 6.29%.

Table 2: Land Use Area

S.N	Description	Areas (Ha)	Percentage	Remarks
1	**Forest Land**	**369.75**	**87**	
	○ Community Forest	346.50	93.71	8 CFs
	○ Leasehold Forest	23.25	6.29	5 LFs
2	**Private Land/ Cultivated Land**	**46.75**	**11**	
3	**Water body**	**8.5**	**2**	

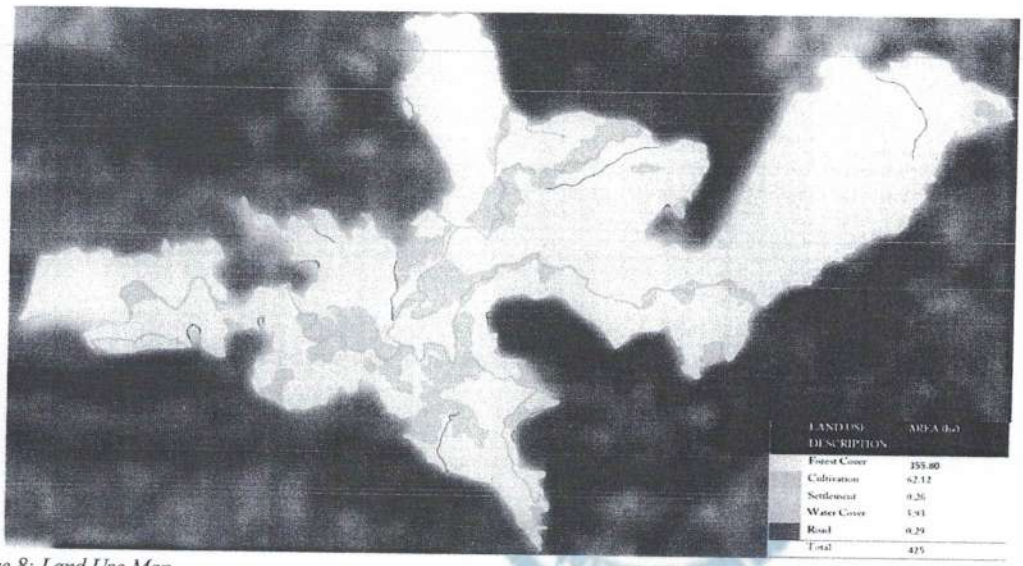


Figure 8: Land Use Map

3.1.4 *Accessibility*

The proposed ZG is accessible via the Prithvi Highway which is around 142 km west from Kathmandu and takes approximately four hours. It can be easily approached by road from Kathmandu, Chitwan, Pokhara etc. by bus on daily basis. Apart from the bus, local vehicles like Micro or Mini Buses, Private vehicles are available on rental basis.

Kathmandu	: 142 Km
Bharatpur	: 70 Km
Mugling	: 31 Km
Pokhara	: 59 Km
Damauli	: 11 Km
Dumre Bazar	: 7 Km
Kurintar	: 37 Km
Manakamana Temple	: 46 Km
Lumbini (E-W Hwy)	: 185 Km

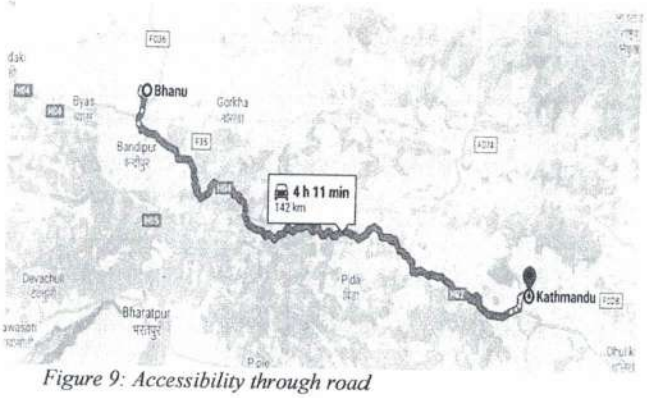


Figure 9: Accessibility through road

3.1.5 *Geology*

Geologically, the proposed ZG site is located in middle mountains. Geology of the project site is sound with respect to surface geological study. Surface big faults, big landslide or unstable geography are not visible anywhere. Surface geology of the site define the design type, quality etc. of any structure on or below the surface of earth. Basically, Grey, gritty chlorite muscovite sandstones grit stones with conglomerates do exist and white massive quartzite in the upper parts.

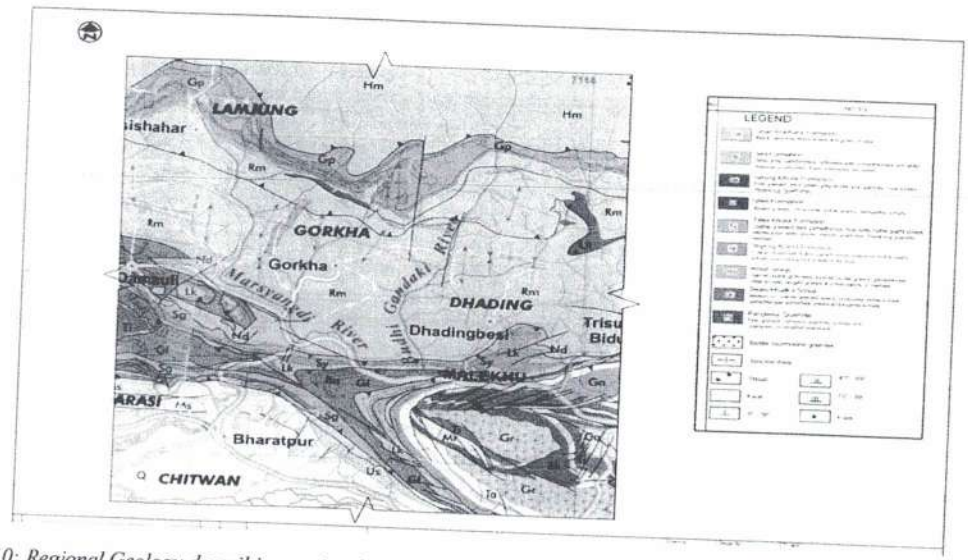


Figure 10: Regional Geology describing project location

3.1.6 *Climate and Rainfall*

The climate of this site is mild and generally a warm. It has subtropical climate with an average annual temperature of 23.1^{0}C. June, July and August are the warmest months with an average temperature above 27.9 °C and January is the coldest one with an average temperature of 15.1^0 C. It is the lowest average temperature of the whole year. The temperature generally varies based on the topographic variations.

Winter rains are more common in this sites however December is the driest months with an average of 7mm rainfall and most precipitation falls in July. The average annual rainfall is 1225 mm.

3.1.7 *Socio-Economic and Cultural Environment*

The project areas are famous for culture and historic. Byas Municipality is named after Maharshi Veda Byash, author of the great Hindu epic Mahabharata. He was born in Damauli at the confluence of River Seti and Madi whereas Bhanu Municipally is named after the first Nepali Poet Adikabi Bhanubhakta Acharya, who translated the great epic Ramayana from Sanskrit to Nepali language. His birthplace is Chundi Ramgha, Tanahu, Nepal. The socio-economic and cultural baseline profile, presented in this chapter is based on the census 2011.

- ***Demography***

The population density of districts is 323,288 with male 143,410 and 179,878 female. Tanahu has human development index (HDI) value of 0.506. Average percentage of household sizes

is 4.13. Byas and Bhanu Municipalities are the averagely populated Municipality of Tanahu district comprises 70,335 in Byas and 45,792 in Bhanu respectively. The total household of the Byas and Bhanu municapilities are 18,339 and 12,095.*(MoFAGA)*. The ZG comprises 5 and 6 ward of Bhanu where the populations are 3404 and 3266. Likewise 11 and 12 ward of Byas Municipality covers the population 5748 and 4495.

- ***Ethnicity***

Chhetri is dominant caste in these sites followed by Brahman, Magars, Thakuri and Dalits. Dalits include Damai, Kami, Sarki. Kumal, Chepang/Praja and Badi community area also exists. Dashain, Tihar, Maghi and Loshar are major festivals. Nepali is the most spoken language in this area.

- ***Education***

Literacy rate of Bhanu Municipality is 98 % and 96 % in Byas Municipality. The rate seems relatively higher in the urban part of the Municipalities. There is a secondary school near by the entrance of the proposed Zoological Garden area, presently about 500 students are enrolled in the school.

- ***Health and Sanitation***

The nearest government district Health Center where people rely on mostly is in Damauli. But both municipalities have health post for minor treatment. Sanitation is in the good condition; recently both the municipalities were declared as open-defecation free municipalities. Awareness rising on need of sanitation has been geared up by different projects and NGOs. The number of toilets in each hotel and in road side houses is being made. Most common diseases reported in the project area are common cold, eye infection, diarrhea, pneumonia, cough, malaria and dengue.

- ***Occupation and Income Level***

Most of the people of project area depend on agriculture, since the agriculture itself not able to sustain the life of poor communities, some skilled people rely on carpentry, mason works etc. Some peoples are in government jobs where as some are in teaching profession but some are local traders as well. Majority of people are jobless and they rotate their skill necessary with in the community and the household near the highway have small running businesses.

3.1.8 *Biodiversity and Natural Resources*

Tanahu district consists of ecological zones of both Mahabharat and Mid-hills and the estimated forest area is 78,111.22 hectare which is 50.52% of the total area of the district. Three types of climatic Zone are found in the district viz. Lower tropical, Upper Tropical and Subtropical. The lower tropical forest ranges from Devghat in the south to the elevation below 300 m consisting only 2.3% area. Upper tropical ranges from 300 to 1,000 meters consisting 88% whereas Subtropical ranges from 1,000 to 2,000 meters consisting 8.8%. The project area consists of dense forest with steep slope in some part. Various species of flora and fauna are found within this area.

- *Flora and Fauna*

Vegetation like Sal, Saj, Bot Dhaiyaro, Simal, Jamun and Camun are the major species found. Similarly, Chilaune, Katus, Utis Tanki etc. are found. (Annex-1). Major mammals found in Tanahu district are; Common leopard, Jungle cat. Golden jackal. Bengal fox, Yellow throated marten, Irrawaddy squirrel, Indian crested porcupine, Indian grey mongoose, Barking deer, Rhesus macaque, Tarai grey langur, Kalij, Common mynabulbul, Red-vented Slender-billed vulture, python, Golden monitor lizard, Frog, Tail Butterfly, Shallow–Tail Butterfly, Short Horn Grasshopper etc. and different species of fruit bats (Annex- 2).which area also visible near the ZG area. Civets, mongooses and fruit bats are the free ranging wild mammals of this ZG. Amongst the mentioned mammals, thousands of fruit bats of Zoological ZG draw the attraction to visitors. Species of flora and fauna are mentioned in Annex 1.

3.1.9 *Environmental Aspect*

The ZG is very important part of the district from the environment point of view. The ZG helps in regulating the micro-climate of that area. On the other hand, it serves as an exotic recreational place of the whole district. Also, from ecological point of view, ZG is the habitat for many plants, animals. Even birds flying in these are creates a beautiful and pleasant environment to watch. The area also consists of dense forest as government managed and community forest.

3.1.10 *Available Physical Infrastructure*

- ***Road***

The site is accessible from Kathmandu by Prithvi Highway. The site could be reached at a distance of 142 km from Kathmandu, around 6 km from the Dumre Chowk of Tanahu District. The site has a number of approach roads. There is a number of old and newly opened public roads that traverses from east to west and north to south within the proposed site.

- ***Electricity***

There are Nepal Electricity Authority installed external electrical sources located on the proposed site. There is number of transformers and three phase line that passes around the site. A newly high voltage transmission line passes through the north boundary of the project. A possible of peltric set could be planned due to access of water resources.

- ***Communication***

The facility for communication is average in the project area. The surrounding settlements have access to landline telephone and mobile services. A number of communication infrastructure service providers are available in the vicinity of settlements and market areas.

- ***Water Resources and Supply***

An independent team carried out a dedicated survey to identify and locate sources of water and create efficient and accessible water supply network for all locations. The water supply system within the site seems sounds enough. Several small streams were visible in the vicinity of the project area that can generate peltric set too.

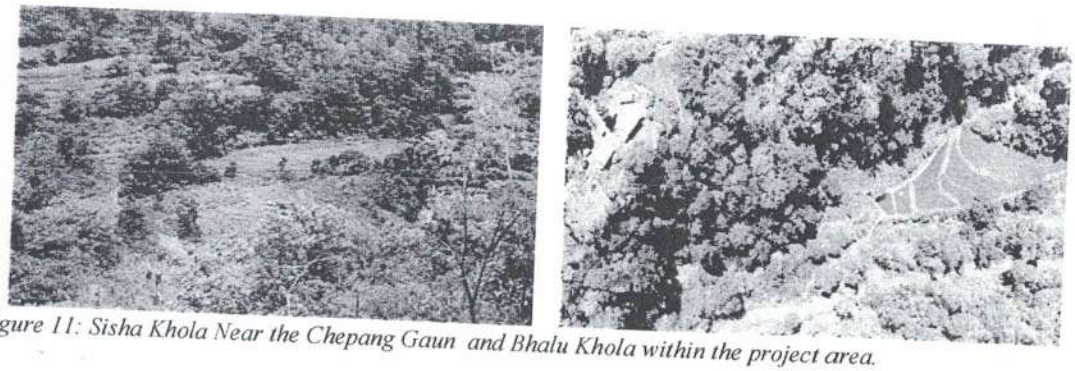


Figure 11: Sisha Khola Near the Chepang Gaun and Bhalu Khola within the project area.

- ***Sanitation and Waste Disposal System***

The overall drainage and sanitation system in settlements around the site area is good. People are aware and recently entire Municipality was declared as "Open Defecation-Free Zone". Since the site has sloped terrain with a good elevation in all four directions which culminates into the central valley. The gravity discharge of the rain is also noted.

- ***Tourist Destinations***

Tanahau is famous as the birth place of Poet Bhanubhakta Acharya. There are several other famous places like Bandipur, Tarebhir, Byas Gupha, Siddha Gupha and Khadgadevi, Thanimai temple in Bandipur. Historical sites comprise Tanahu sur Palace (16 km from Dumre), Bandipur, Bhanu birth place at Chudi, Ramgha and Rising Rani Pokhari (South West from Damauli).

Apart from these religious sites, Manakaman Temple in Gorkha district is also one of the most popular temple where 1 million visitors visited each year. Those visitors are possible to visit this projected area for recreational purpose. Similarly, tourists can fix other popular destinations like Fewa, Annapurna based camp, Ghale gau, Chitwan National Park, Narayani river etc. from this ZG. Lumbini visitors can also visits on the away to Pokhara.

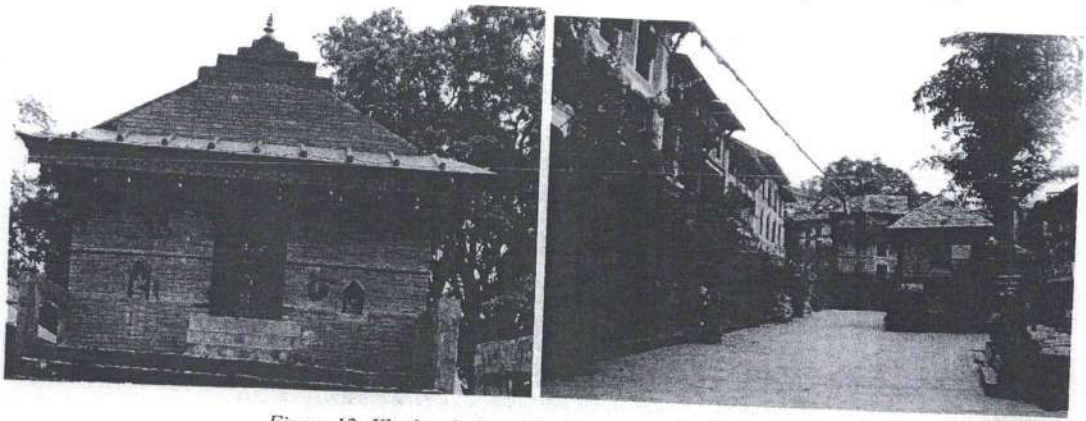


Figure 12: Khadga devi temple at Bandipur and Bandipur Bazar

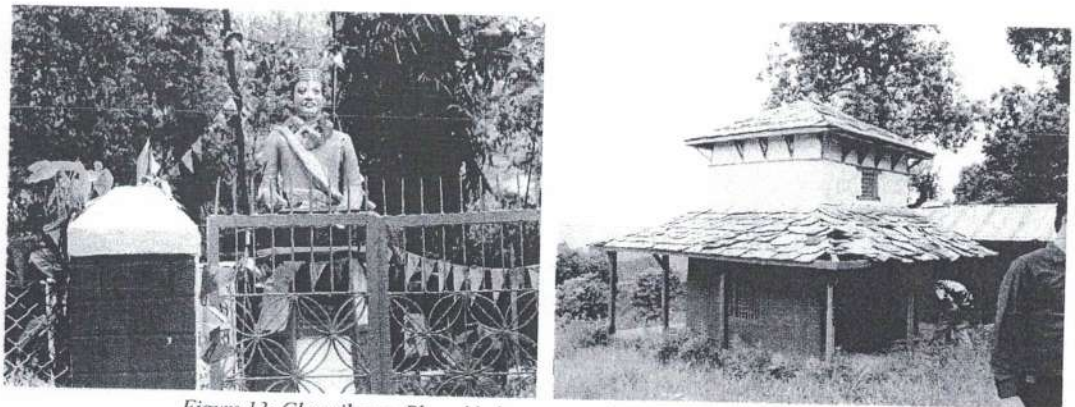


Figure 13: Ghansikuwa, Bhanubhakta memorial park and temple at the project Area

CHAPTER 4 – MASTER PLAN

The Master plan of the Bhanubhakta Zoological Garden is comprehensive documents to guide systematic and planned development of the ZG which has been prepared of 20 years considering its land use pattern, water resources, visitors flow, cost effective and aesthetic resources. The master plan is prepared to provide holistic nature conservation, ecosystem management, natural resource sustainability and continuation of co-existence between human and wild animal. Similarly, this ZG is expected to educate people and act as a hub for recreational centers that cater service to meet aspirations of people for recreation and amusement.

4.1 Vision

The Vision of the Bhanubhakta Zoological Garden master plan is to enhance ex-situ conservation of wildlife,

4.2 Goal

The goal of the Bhanubhakta Zoological Garden master plan is to develop well establish Zoological Garden bearing native and non-native wildlife species contributing to economic prosperity.

4.3 Objectives

The primary objective of the consulting service is to prepare the Master Plan and Conceptual Design of Bhanubhakta Zoological Garden in order to protect and conserve the animals, conduct research and promote education on animals and their habitat. The followings are the major objectives of Bhanubhakta Zoological Garden:

1. To conserve common to threatened species of native and exotic wildlife.
2. To educate and make aware on the importance of wildlife conservation.
3. To manage orphan, rescued and problematic wildlife by providing proper veterinary health care services.
4. To conduct researches on wildlife breeding at genetic level and establish database.
5. To promote tourism for livelihood improvement and employment generation.

The specific objectives of the projects given in the TOR are:

- Collection of baseline information on physical, socio-economic, cultural and biological aspects of the surrounding communities,
- Detailed assessment and investigation of the proposed site in terms of existing features,
- Preparation of the Topographic Map of the site area,
- Preparation of Master Plan of Bhanubhakta Zoological Garden to explore the appropriate design of Infrastructure like Landscape Design, entrance Gate, Improvement of Approach Roads, Water supply and Sanitation Facilities, Office

Building, Training Hall, View Tower, Meditation Centres, Lab and Livestock hospital, animal Sanitation Facilities, Wildlife Safety and Security, Visitors Information Centre, Rescue Centre of Wild Animal,

- Biodiversity Conference Hall with library, Guest Houses,
- Preparation of Conservation Education Centre,
- To develop a place that generates a sense of peace and research together with places for recreational activities, ZG, flora and fauna and provide research facilities for zoological activities and biodiversity etc.,
- Develop internal trekking trails for interconnection of the Zoological Garden and Recreation areas and Plan and basic design of animal rescue centre.

4.4 Scope of the Works

Since the primary scope of this study is to prepare Master Plan through the three stages as stated in the TOR, the scopes of the study largely includes the essentials related to arriving at such Master Plan through a methodological approach involving indicative plan preparation and the feasibility studies of programs and projects. The scope of the study necessarily includes but not restricted to the followings:

- Topographical surveys and geological investigation
- Review existing literature related to Community forestry, development of Sister ZG and Biodiversity Conservation etc.
- Prepare preliminary architectural plans and design and structural analysis and design of the ZG components.
- Prepare final structural design drawing and prepare cost projections
- Building services shall include electrical, water supply and sanitation, telephone lines and other specialization service inputs (e.g. plantation of various species and soil conservation, interior designing etc.) as required.
- Preparation of preliminary cost-estimates based on the plan and design.

4.5 Consideration of Master Plan

Zoological Garden is historically, geographically and religiously important place. The ZG is more significant for the wildlife species and tries to refer for maintaining their ecosystem friendly. Moreover the major consideration for the preparation of the master plan of the ZG and its surrounding includes:

4.5.1 *Accessibility and Convenience*

The ZG is located on easily accessible and convenient site. The entrance will be clear and visible from the distance and also information board will be placed near the gate above ticket counter as well as several sign post and information board will also be placed at major junction of both municipalities so that no one get confuse about the entry point. Besides that the ZG inside will have clear pathways and signage for guidance and directions of the people.

4.5.2 *Environment and Ecology*

The ZG is designed in such a manner that it makes minimal intervention in the existing environment and ecology. Destruction of wildlife species are also avoided as much as possible during any kind of constructions. The materials for the construction of infrastructure inside the ZG are prioritized with their ecofriendly environment and also the local material of the area.

4.5.3 *Service Area*

The service areas are places to locate information centers, maintenance facilities, and similar other essential functions. They are best located at the entrance of the zone with parking facility outside the boundary. The services areas with information center, rescue center, research center, meditation center etc. are also planned. The master plan also includes different facilities and service center under administration, display/exhibit, rescue & research and peace & mediation areas.

4.5.4 *Recreation and Exhibition*

The area is planned in such a way that it provides full recreation and refreshment to the visitors through exhibition and display of different wildlife species. The provision of View tower, Rock Garden, Children Park etc not only attracts different generations of visitors but also help in revenue for the ZG.

4.5.5 *Sustainability*

The master plan incorporates efforts to address the increasing negative effects of climate change and need to conserve natural resources by including sustainable approaches to preservation and management. Management of waste, water resources, drainage and sewerage, wild animal enclosure etc. is recommended for environmental and ecological sustainability. The plan also suggests ways of making the park socially sustainable, through engagement of community organizations and private sectors.

4.5.6 *Operation and Maintenance*

A proper management committee will guide and personnel staff will administer and manage the ZG in long run. Certain rules and guidelines should be prepared for the management and operation of the ZG.

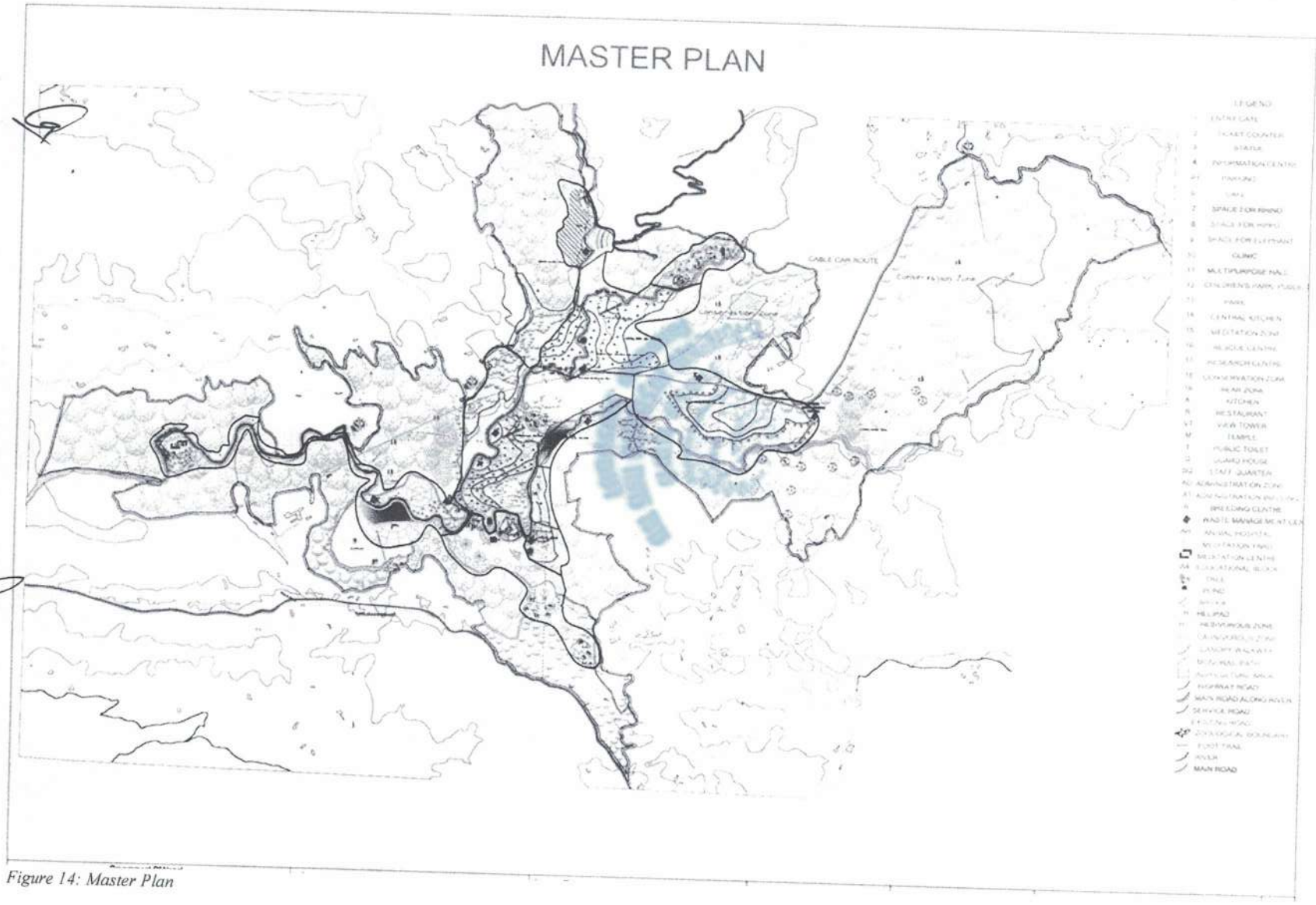


Figure 14: Master Plan

4.6 Strategies and Activities

The strategy and activities of the ZG will aim at achieving the vision and goal of the ZG. The master plan is a 20 year of vision plan for meeting the needs to achieve the vision and goal. The ZG authority will try its outmost effort to obtain requires funding for implementation of master plan from the major sources like entrance fee, parking and other facilities. Similarly, the grants from local, province and other conservation partners is another sources of the ZG. This ZG will also play significant role manage problem wildlife, so it has some social and other costs that is negligible counted in cost benefit analysis.

Objective 1: To conserve native and non-native wildlife species.

Strategy

- Zonation of the Zoological Garden.
- Ex-situ conservation of wildlife species.
- Develop wildlife facilities and accessories.
- Acquisition of native and non-native wildlife species.
- Production and supply of wildlife foods and forages.

Activities

- Zonation, land preparation and landscaping.
- Develop habitat (design and construction of enclosure).
- Establish and maintain garbage boxes in proper distances.
- Develop solid waste and waste water management system.
- Carcass disposal.
- Protect existing water sources and maintain regular water flow with proper inlet and outlet.
- Develop drainage and sanitation system.
- Wildlife acquisition, transportation & exhibition (Aagleraha, Dovan, Naubise, Dumre, Bhalukhola, Fatyadihi, Chisapani).
- Plant palatable grass and fodder species (Bojhe, Shankhar khola/Bhanjyang).
- Construct kitchen and cold storage for food and forage stocking.

Objective 2: To provide recreational value of wildlife and educate the visitors.

Strategy

- Establishment of visitor information center.
- Development of wildlife exhibition and recreational facilities.
- Preservation of religious, historical and cultural sites.
- Capacity building of staff and local.
- Development of outreach programs.

Activities

- Design and construct visitor information center.
- Regulate and provide information through signage and published materials.
- Give formal briefing and instructions to organized group of students, researchers and tour groups.
- Encourage visitors for wildlife recreation/fun.

- Develop children park, view tower, view point, water fall, canopy walk, nature walk as well as bridge, access and service road, power supply, charging center, souvenir shop, restaurant, etc.
- Renovate temples in and around the ZG (i.e. Siddha Baba).
- Training on wildlife interpretation, visitor's guide, wildlife handling, etc., based on TNA.
- Produce and disseminate information materials i.e. wildlife bulletin, hoarding boards, sign boards, brochure, leaflets and website.
- Awareness campaign and celebration of conservation days.

Objective 3: To conduct wildlife researches and establish database.

Strategy

- Establishment and management of well-equipped laboratory.
- Develop Management Information system (MIS)
- Promotion for research and publication

Activities

- Establish and manage well equipped research laboratory.
- Purchase equipment, kits, drugs and chemicals, etc.
- Develop system for documentation, storage, retrieved and data management.
- Support study, research and publication.
- Train and capacitate on wildlife forensic, visitor management, impact monitoring and research techniques.
- Capacity building through excursion and exposure visit for staff (inside/outside the country).

Objective 4: To promote livelihood and employment through tourism.

Strategies

- Promotion of micro enterprises and homestay.
- Employment generation
- Improve (Scale up) livelihood of local people

Activities

- Establish souvenir shop, restaurant, home stay and cultural center.
- Training on nature guide, home stay and hospitality management.
- Conduct orientation training on technical and business management skill for community (Deurali, Nabrung, Chhirkan).
- Promote and diversify local products, local/traditional handicrafts and souvenir (Nabrung, Garam/Bar Bhanjyang).
- Establish market linkage and value addition of local products.
- Facilitate cultural show with local and traditional food and costume.

Objective 5: To manage orphan, rescued and problematic wildlife.

Strategies

- Establishment of rescue center of Gandaki Province,
- Establishment of veterinary facilities, quarantine/Isolation center.
- Establishment and mobilization of Wildlife Rescue Team (WRT).
- Coordination with stakeholders for problem wildlife management

Activities

- Develop rescue center, holding center, quarantine center and isolation center (Simle area).
- Construct wildlife carriage devices, transportation.
- Inspection of wildlife foods and forages.
- Regular wildlife health checkup.
- Strengthen veterinary services.
- Training on animal husbandry, wildlife rescue, health condition assessment and handling.
- Procure wildlife ambulance, equipment, drugs, materials and logistic.
- Coordination with concerning PAs, DFOs, local governments and other stakeholders.

4.7 Limitation of Master Plan

In general, the master plan identifies and provides solutions to different problems. This document provides information in actionable format. Drawings enclosures are based on the survey. Meanwhile ground realities may be different than assumption. So detail survey of some areas may be required to incorporate detailed planning. It is visualized that provided data and design will lead to detailed engineering drawings.

4.8 Conceptual design of Zoological Garden

Various factors including geological and geomorphological distribution of land and accessibility were the primary criteria for Land Use planning by the components of ZG. The overall area is purposed for the Conservation Zone and Utility Zone based on the analysis of physical and social attributes. And the utility Zone serves as Administration Area, Exhibit/Display Area, Peace & Meditation Area and Rescue & Research Area. The main considerations made for the zoning includes but not restricted to:

- Consider the entire site for the integrated development of ZG, zoological facilities, recreational and allied facilities with modern service and utilities.
- Make the best use of the existing buildable areas and the different opportunity that the sloping land provides.
- Make the judicious use of the existing public roads in the master plan to avoid community conflicts.
- Make the best use of low land on the south edge of the site to develop service roads to cater to various service needs.

Criteria for Zonation

4.8.1 Conservation zone

Conservation zone is selected mainly on the basis of:

- Dense natural vegetation
- Topography (*Steep slope and elevation).*
- Mostly inaccessible.

4.8.2 Utility Zone

The utility zone is selected mainly on the basis of:

- Suitable habitat and land use pattern.
- Availability of water sources.
- Fewer disturbances from surrounding settlements.

Similarly, the areas are selected mainly on the basis of:

- Easy access
- Semi open enclosure
- Low gradient topography
- Cost effective
- Minimum level stress (Wildlife)

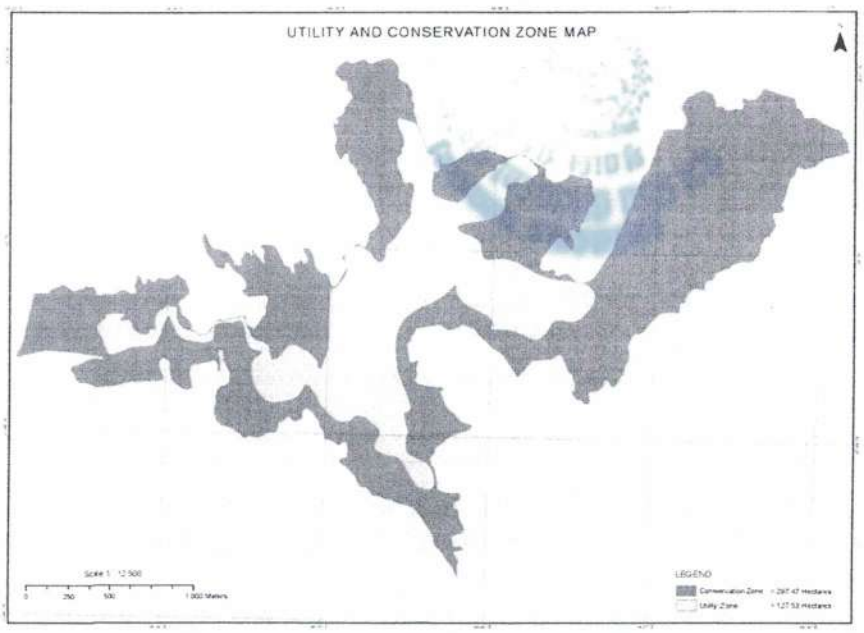


Figure 15: Utility and Conservation zone

Propose of infrastructure, enclosures and placement of animals in different areas is mainly guided by available habitat, resources, aspect and geology. Animals with similar habits and ecological requirements and taxonomic groups are segregated in transverse sections

providing the different areas to workout in varieties of then allocated areas are described below:

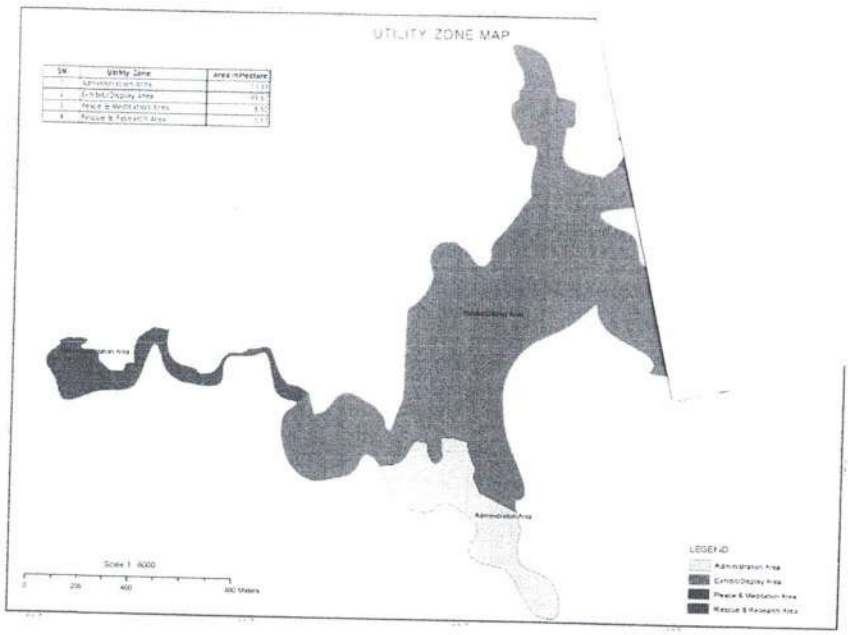


Figure 16: Utility Zone

Table 3: Areas with covered spaces

S.N.	Area	Total covered space (Ha)
1	Administration	13.89
2	Exhibit/Display	99.67
3	Peace & Meditation	8.8
4	Rescue & Research	5.17
	Total	**127.53**
	Rest of the area is allocated for the conservation	297.47
	Grand Total	**425**

4.8.3 Administration Area

The Administration area has planned close to the entrance for the office and administration activities comprises main office building, ticket counter, guard house, children park, public park etc. The area also covered of multipurpose conference hall with educational centre, information centre, staff quarters, clinic, café/restaurant. This area covered the sites of Shankar, Bhanjyang, Bajebajaithan and Ale gaun. The traversing pedestrian walkways from the main spinal road are designed in such a way that it allows visitors to provide walking experience through different levels and reach the designated viewing platforms for viewing the animal exhibits. Service way is segregated for service purpose and not allocated for the public. Its main concern is to serve the different services in the ZG. Office buildings with

multipurpose hall, restaurants and other recreational amenities are located at strategic locations to administration and cater to the visitors need.

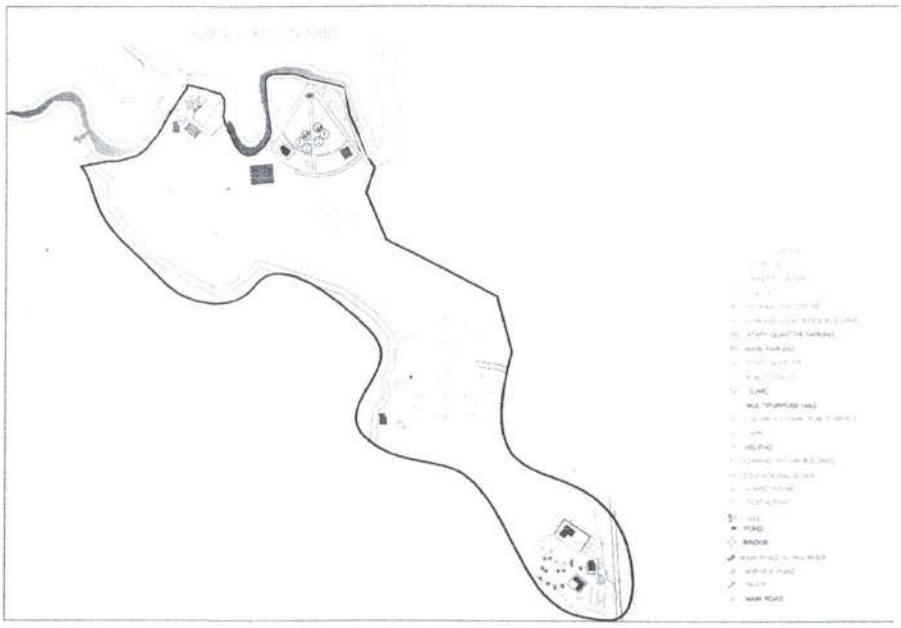


Figure 17: Administration area with major structures

The Administration area contains following major units:

S.N.	Administration Area	No.
1	Bhanubhakta Zoological Office Building	1
2	Educational Block	1
3	Parking near office building(P1)	1
4	Guard House	3
5	Staff Quarter Parking (P2)	1
6	Helipad	1
7	Staff Quarter	14
8	Main Parking(P3)	1
9	Clinic	1
10	Information Centre	1
11	Multipurpose Hall	1
12	Public Toilet	4
13	Boundary Entrance	1
14	Main Entrance	1
15	Child Friendly Tap	5
16	Restaurant/Café	1
17	Ticket Counter	1
18	Statue	1
19	Children Park	1
20	Public Park	1

4.8.4 *Exhibit/Display Area*

Exhibit & Display area has been completely isolated from other thematic areas within the project boundary and covers the sites of Agleraha, Dovan, Naubise, Dumre, Bhalukhola, Simle, Fatyadihi, Hattibandhne Dhunga.It is planned for providing similar habitat spaces for different species of wildlife along with the required services, amenities and facilities. Allocation of enclosures for different species of wildlife has been planned in several sections according to approved guideline of WAZA. The area is purposed with different species of herbivores, carnivores and omnivores. Moreover, rock garden, view tower, animal kitchen, etc. are also purposed. A central kitchen is also proposed which will overlook all other kitchens.

More than 200 species of wild animals are proposed in this area for display. Animals with different feeding characteristic will be placed separately maintaining significant separation distance. Core conservation zone will be left in its natural state. The main purpose of area is to provide the regular streams of revenue to sustain the whole ZG.

This area is further divided into eight sections based on the suitable habitat for wildlife. The section contains Avifauna, Bear, Carnivorous, Hare/mangoes/porcupine/civet, Herbivores, Herpeto fauna, Mega herbivores, Omnivorous.

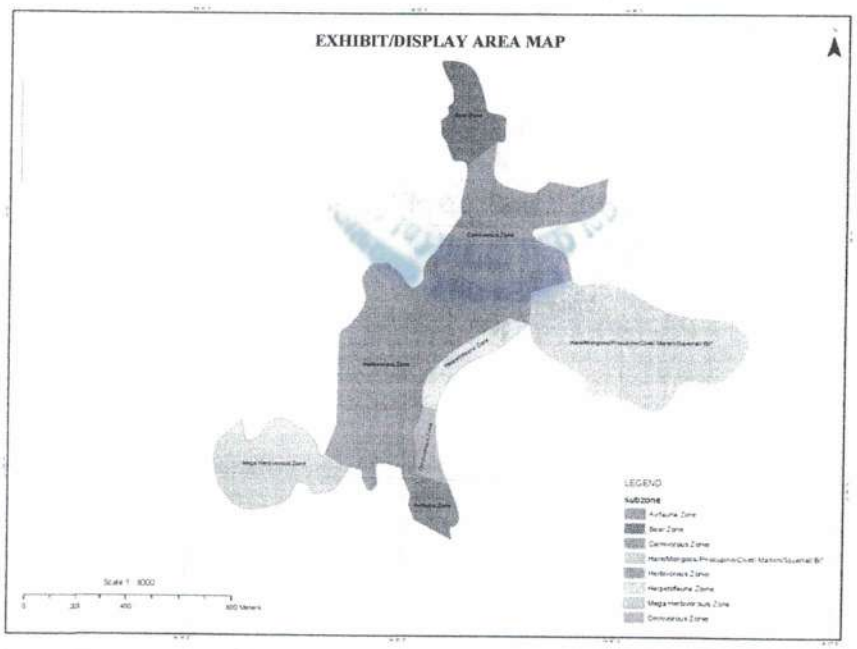


Figure 18: Exhibit /Display area

Table 4: Sections and space covered

S.N	Section	Areas (ha.) Excluding enclosure
A	Herbivores	29.42
B	Mega herbivores	11.02
C	Carnivorous	20.27
D	Bear	5.89
E	Hare/mangoes/porcupine/civet	24.38
F	Herpetofauna	3.55
G	Avifauna	2.99
H	Omnivorous	2.15

Basically following major structures are proposed for this area.

S.N.	Exhibit/Display Area	No.
1	Animal Kitchen	7
2	Central Kitchen	1
3	Pond	7
4	Rock ZG	1
5	Restaurant/Café	3
6	Guard house	8
7	Central Kitchen	1
8	View Tower	2
9	Public Toilet	12
10	Temple	1

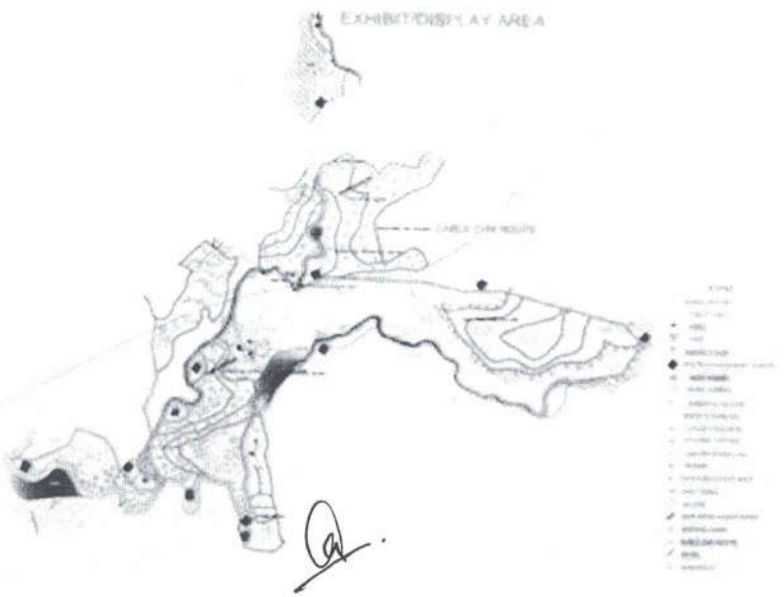


Figure 19: Exhibit area with major structures

4.8.5 Rescue & Research Area

In addition to Veterinary, Rescue centre, holding centre, quarantine house, isolation centre for specific animal species is proposed in Simle and Bojhe sites. It is established with objectives to treat injured, diseased/sick animals of ZG and also provide treatment to rescued/orphan animals from forest and rehabilitate them to their respective habitat as far as possible. Similarly, research centre will conduct the research for the wildlife species and their characteristics to outsider students as well as any institutions. It is planned near aviary section proper with dispensary, basic diagnostic facilities, operation theatre, X- ray facilities, indoor patient ward with squeeze cages, isolation ward, and quarantine ward and post-mortem room. The operations and execution of rescue centre will be carried out with the qualified and experienced veterinary support. A Pathological-cum-Diagnostic Laboratory will be established within for performing pathological and diagnostic tests of the zoo inmates.

It should have mobile squeeze cages, syringe projector, and immobilization drugs and chemicals apart from the common pharmaceutical and surgical equipment and other sundries used in the rescue center. A compendium of the drug dosage for the different taxa should be made available.

S.N.	Rescue & Research Area	No.
1	Rescue Centre	1
2	Pond	1
3	Animal Hospital	1
4	Restaurant/Café	1
5	Research Centre	1
6	Public Toilet	3
7	Child Friendly Tap	4
8	Guard House	1
9	Enclosure	

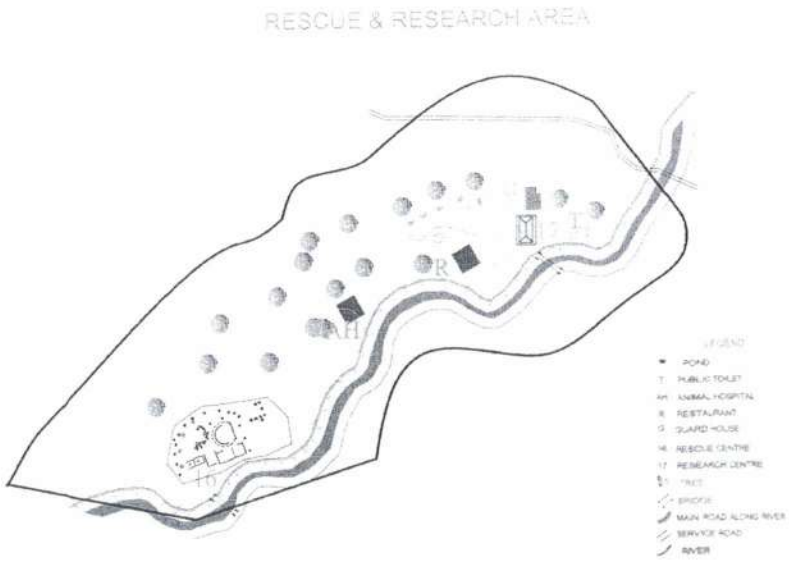


Figure 20: Rescue and Research area with major structures

The problem animal is categories and services based on:

Old Animal Care: With advancing age, wild animals should not be totally isolated from their families and fellow animals. If kept at a distance, they can suffer from mental stress and depression. Therefore, for the old animal, well-protected care centers should be constructed nearby the corresponding sites with proper ventilation, drainage and sanitation facilities.

Pregnancy Care: When the female animals reach advanced pregnancy, they should be kept in separate pens. Provision of proper diet, clean drinking water, protection from cold and heat waves, proper hygiene and sanitation under the control and management of caretaker is a must.

Sick Animal Care: Unless urgently needed, sick animals and birds of the Zoological ZG should not be rushed to the veterinary hospital. Whenever possible, they should be treated in their own captivity. If carried outside, they can suffer from psychological shock and in a strange environment, diseases cannot be cured easily. Therefore, in normal sickness, wildlife should be placed in sick animal pens and treatment carried accordingly.

Rescue/ Animal Care : Wild animal captured from conflict sites are kept in well-established cages. Provision of proper diet, clean drinking water, protection from cold and heat waves, proper hygiene and sanitation, proper veterinary care under the control and management of caretaker is a necessary.

Quarantine House : Quarantine" means the process to confirm any animal, animal products or animal production inputs whether diseased or not and put such animal, animal products or animal production or inputs in isolation in specific place, together with or separately for a period of time as prescribed for their inspection. In this regards, the ZG has proposed many economical important animals for display which should be introduce from outside. Thus, it is

essential to protect animal from diseases and to prevent the entry of exotic animal diseases the quarantine is very essential.

4.8.6 Peace & Meditation Area

A separate peace and meditation area has been proposed near to Dunde and Ramthunki sites for peaceful, calm and quite place. However, it's closer to second entrance and will be easily accessible by small vehicles. A significantly large hall for the meditators will be available equipped with required facilities such as meditation yurts, garden, café/restaurants and guard house. With the water stream flowing through the sides of the meditation yurt it will provide a more rejoicing view for nature lovers. A pocket of open spaces full of greeneries and shrubs along with the toilets facilities, cafe blocks are also provided along the main road where people can gather and have some spaces to rest, refresh and relax. The open spaces will also have benches where people can relax, work and enjoy the peaceful beauty of the area. The meditation hall will be major attraction for the meditators and yogis. A motor road from the service entrance goes to the meditation hall area while a foot trails from hall access visitor to meditation spot. The peace spots are situated at significantly higher points. The meditation centre will have lodging and food facilities for the visitors who wish to stay there for longer time. The primary structures of the Peace and mediation area are as follows:

S.N.	Peace & Meditation Area	No.
1	Pond	1
2	Meditation Centre	1
3	Meditation yard	3
4	Guard House	1
5	Public Toilet	1
6	Child Friendly Tap	2
7	Restaurant/Café	1

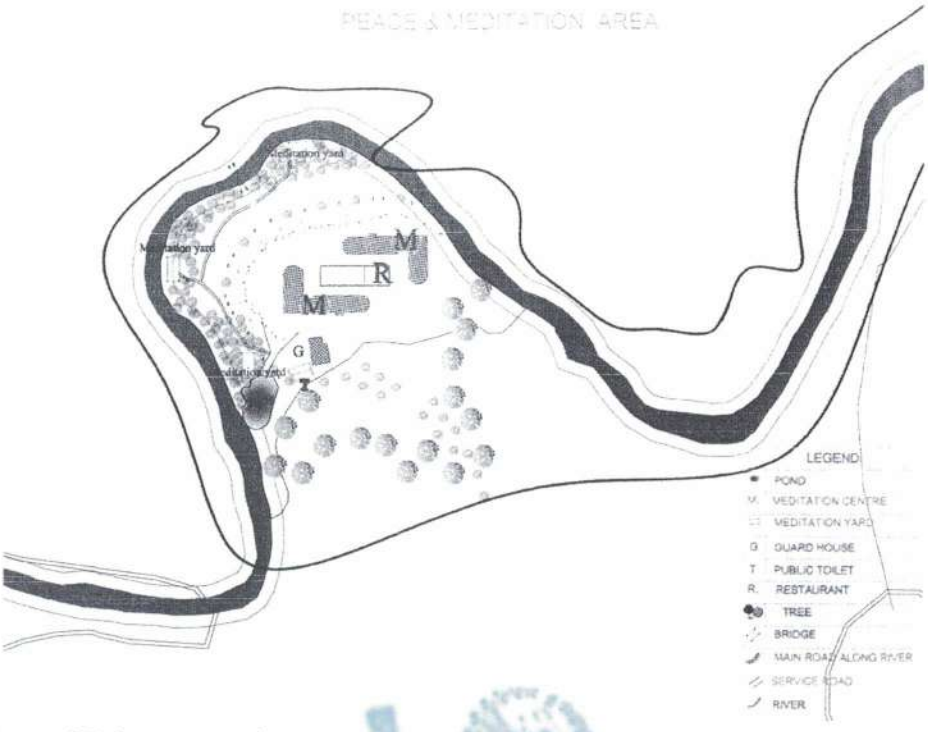


Figure 21: Peace and Meditation area with major structures

CHAPTER 5: CONCEPTUAL ENGINEERING DESIGN

5.1 Infrastructure Development

5.1.1 *Road (Pedestrians and Vehicular)*

Road transportation plays a dominant role in the development of the physical infrastructure of any location so there is no doubt to say transportation is the backbone of infrastructure and is one of the basic elements of tourism infrastructure. Without organizing and operating its transport system, which consists of a network of routes or means of transport and the modes of transport such as motorized vehicles like car, aircraft, boat, tourism development and effective utilization of destination's tourism resources for the present and future needs is impossible. The availability of adequate transport facility, safe, convenient, fast and cheapest prerequisites is the purpose of sustainable tourism.

The major transportation in the ZG is envisioned to be electric vehicle. Additionally, bicycles and elephant rides will also be used for the transportation. However, diesel service vehicles may be used occasionally, and the road needs to sustain their loads as well.

The present road network of Bhanubhakta ZG consists of about 51.12 km for a ZG area. This road section is divided into two categories which are Main Road and Service Road. Main road will be constructed with width of 12 m. Main road consist of carriageway, drain in one side, footpath and cycling lane. Around 25.15 km of service road will be constructed to provide easy access to the different zone from main road and also for the future extension of road to main road. Proposed road network will provide easy access to different zone (Admin zone, Conservation zone, Recreational zone and Meditation zone) and also facilitate interconnection between the different proposed zones.

The ZG touches about one km of the Prithivi Highway depending on land transport only for the means of travelling and transporting goods. Road network within the ZG plays significant role to develop different proposed zone within the ZG.

A trail is usually a path, track or unpaved lane or road. The width of trail road is proposed 2m which also include stone paved step.

Main Road:

Detail features of main road are as below:

- Carriage Way Width: 7m
- Tick Drain with Kerbstone: 1m (One side only)
- Cycle Lane width: 2m (Both side)
- Footpath: 1.5m
- Shoulder Width: 0.75m

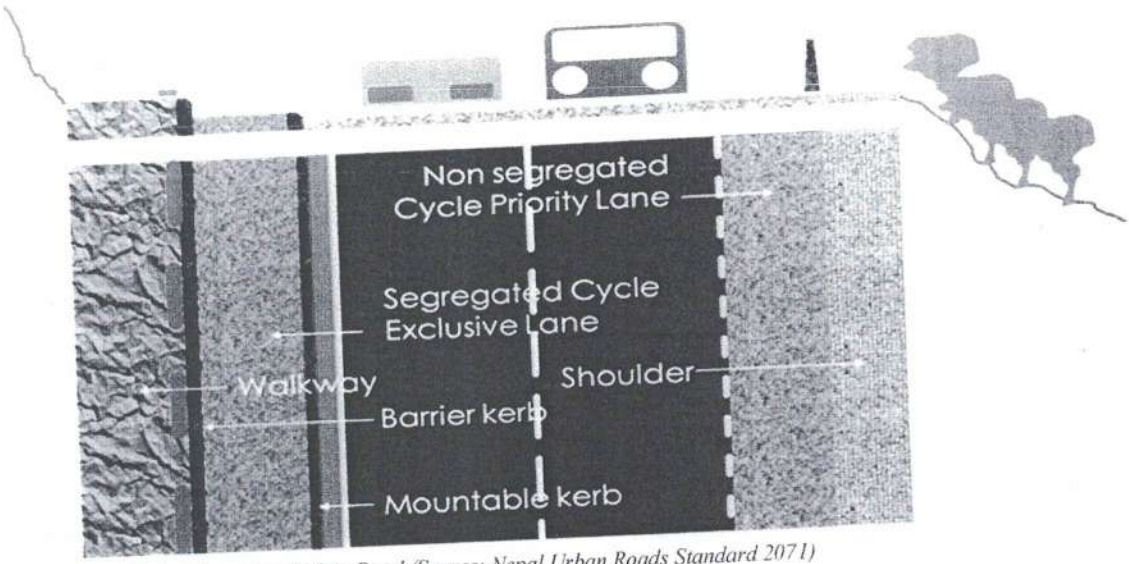


Figure 22: Typical Drawing of Main Road (Source: Nepal Urban Roads Standard 2071)

Service Road:

- Carriage Way Width: 3.75m
- Tick Drain with Kerbstone: 0.5m (One side only)
- Cycle Lane width: 2m (Both side)
- Shoulder Width: 0.75m:

The third type of road is a pedestrian road. It is considered to be 3m wide with a 1m drain on each side.

The details of the location and positioning of Main road and Service tracks are provided in the drawings. The design is considered based on the terrain, expected traffic, planned visitor's movement and location of other structures.

Road Network of Bhanubhakta Zoological Garden, Byas, Tanahau

Table 5: Road Network (Main Road, Service Road and Trail Road)

Road Code	Description	Chainage (m)	Remarks
MR1	Peace & Meditation area - Admin area - Display area - Rescue & Research area	5+650	Along the river bank
MR2	Peace & Meditation area - Admin area - Display area - Rescue & Research area	5+650	Along the river bank
MR3	From Entrance gate at Deurali - MR1(CH 2+450)	0+600	
MR4	From Boundary Entrance - MR1(CH 3+000) near Dovan	0+900	Starts from zoo boundary
MR5	From MR2(CH 2+450) -MR2(CH 3+100)	0+570	

MR6	From MR2(CH 3+300)- Entrance Gate	0+400	
MR7	From Dovaan at MR1(CH 3+100) - Conservation zone	3+200	Along the river bank
MR8	From Dovaan at MR1(CH 3+100) - Conservation zone	3+200	Along the river bank
MR9	From Dovaan at MR2(CH 4+700) - Conservation zone	1+100	Along the river bank
MR10	From Dovaan at MR2(CH 4+700) - Conservation zone	1+100	Along the river bank
MR11	From Entrance (4) – Helipad	0+800	
	Total	**23+170**	

MR= Main Road,

Road Code	Description	Chainage (m)	Remarks
SR1	Along the Boundary	23+650	
SR2	From SR1(CH 20+150) - MR7 (CH 1+450)	0+150	Meet at river crossing
SR3	From MR8(CH 2+200) - Waste Management Centre - Carnivorous Zone at MR1(CH 4+200)	1+350	
	Total	**25+150**	

SR= Service Road

Road Code	Description	Chainage (m)	Remarks
FT1	From End of MR1(CH 5+650) - Tare Vir	1+700	
FT2		1+100	
	Total	**2+800**	

Existing Road Network

S.N	Description	Chainage (m)
1	From Highway to Ghasekuwa	1+880
1.1	Branch Road	0+260
2	From Highway to Tare Vir	7+880
2.1	First Branch Road	0+850
2.2	Second Branch Road	0+700
2.3	Third Branch Road	0+740
2.4	Fourth Branch Road	0+980
2.5	Fifth Branch Road	0+800
	Total length of existing road	**14+090**

5.1.2 *Water Resources Planning*

The natural surface water source in the area is sufficient. There are two major free- flowing streams near the project zone. The water should at least filter and treated well before distribution to proposed over-head tanks. The location of overhead water tank is planed near the ridges of the hill. The water-lifting mechanism is required to store the water in the tanks. The location of tanks is to be selected in such a way that, gravity-flow is possible for the distribution. Some areas need special pumping provision too.

Further, there is large potential for rainwater harvesting which has been planned to be utilized. About 10% of building water requirements is estimated to be fulfilled by the rain-water harvested from roof of the buildings. Further, major water requirements for ponds are also planned to be provided from rain-water harvesting. Natural drains on the natural surface are to be provided such that, the surface runoff from clean area is collected to a natural collection pond. Then, the water from collection pond is passed through natural filter to collect the filtered water to next fenced storage pond. This water will be pumped into other ponds and utility facilities. This water is expected to meet 25% of the pond water requirements.

Water demand is one of the key factors in the formulation of any water supply project with its implication in project cost. Factors affecting the water demand are personal habits, industrialization and climatic condition, reliability of supply, cost of water and availability of supplementary sources. The water demand is calculated based on the infrastructure to be developed within the Bhanubhakta ZG such as, office building, educational center, multipurpose building, and resort, picnic spot, fun park, meditation hall, and also animal need in the conservation zone. The water demand is calculated with focusing on the flow of tourist/visitors in the ZG. Average tap flow requirement for the proposed different zone is estimated at 1.62 liter per second. Approximate length of transmission line pipeline is 9.28 km and that of distribution network is around 36.02 km.

Typical structure to be used during the development of water supply system are Break Pressure Tank (BPT), Collection Chamber (CC), Distribution Chamber (DC), Reservoir Tank (RVT), Ferro cement Tank, sedimentation and treatment plant, Intake structure and so on. All the structures are according to their purpose of requirement which is not compulsory for all structure to be present at the same scheme.

Table 6: Demand Calculation Sheet

Tap No	Description of Tap: Cluster Name or Locality	No.	Water Demand	Total Water Demand (lpd)	Wastage @10% of [12]	Grand Total Water demand	Tap Flow Calculation: Average Tap Flow (lps)	Peak Factor (Factor)	Peak Flow (lps)	Design flow (lps)	Adjusted Peak factor (lps)
	Admin Zone(RVT1)										
1	Bhanubhakta Zoological Office Building	1	4,000	4,000	400	4400	0.05	3.00	0.04	0.10	2.17
2	Educational Block	1	4,000	4,000	400	4400	0.05	3.00	0.14	0.10	2.17
3	Guard House	3	600	1,800	180	1980	0.02	3.00	0.06	0.10	4.76
4	Staff Quarter	14	1,500	21,000	2,100	23100	0.24	3.00	0.73	0.35	1.44
5	Clinic	1	1,000	1,000	100	1100	0.01	3.00	0.04	0.10	8.33
6	Information Centre	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
7	Multipurpose Hall	1	4,000	4,000	400	4400	0.05	3.00	0.14	0.10	2.17
8	Public Toilet	4	2,000	8,000	800	8800	0.09	3.00	0.28	0.10	1.08
10	Restaurant/Café	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.10	1.72
11	Ticket Counter	1	400	400	40	440	0.01	3.00	0.02	0.10	20.00
12	Children Park	1	3,000	3,000	300	3300	0.04	3.00	0.11	0.10	2.86
13	Public Park	1	4,000	4,000	400	4400	0.05	3.00	0.14	0.10	2.17
14	Statue	1	500	500	50	550	0.01	3.00	0.02	0.10	16.67
	Sub Total			58,700	5,870	64,670	0.880		1.942	1.550	
	Peace zone(RVT2)										
1	Meditation Centre	1	1,000	1,000	100	1100	0.01	3.00	0.04	0.10	8.33
2	Meditation yard	3	4,000	12,000	1,200	13200	0.14	3.00	0.42	0.42	3.02
3	Guard House	1	600	600	60	660	0.01	3.00	0.02	0.10	14.29
4	Public Toilet	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
6	Restaurant/Café	1	4,000	4,000	400	4400	0.05	3.00	0.14	0.14	3.04
	Sub Total			19,800	1,980	21,660	0.227		0.691	0.860	
	Exhibit/Display Zone(RVT-3)										
A	**Mega Herbivore Zone**										
1	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Guard House	1	600	600	60	660	0.01	3.00	0.02	0.10	14.29
3	Breeding Centre	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
B	**Herbivore Zone**										
1	Central Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
3	Guard House	3	600	1,800	180	1980	0.02	3.00	0.06	0.10	4.76
4	Public Toilet	3	2,000	6,000	600	6600	0.07	3.00	0.21	0.21	3.04
6	Mandir	1	1,000	1,000	100	1100	0.01	3.00	0.04	0.10	8.33
7	Multipurpose Hall	1	3,500	3,500	350	3850	0.04	3.00	0.12	0.13	3.17
8	Children Park	1	3,000	3,000	300	3300	0.04	3.00	0.11	0.11	3.14
9	Restaurant/Café & Souvenir Shop	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
10	View Tower	1	1,000	1,000	100	1100	0.01	3.00	0.04	0.10	8.33
C	**Avilfauna Zone**										
1	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Public Toilet	3	2,000	6,000	600	6600	0.07	3.00	0.21	0.21	3.04
D	**Omnivorous Zone**										
1	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Public Toilet	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
3	Guard House	1	600	600	60	660	0.01	3.00	0.02	0.10	14.29
4	Restaurant/Café	1	4,000	4,000	400	4400	0.05	3.00	0.14	0.14	3.04
E	**Harpetofauna Zone**										
1	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Public Toilet	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
	Sub Total			68,500	6,850	75,350	0.784		2.382	2.600	
	Exhibit/Display Zone(RVT-4)										
A	**Carnivore Zone**										
1	Guard House	3	600	1,800	180	1980	0.02	3.00	0.06	0.10	4.76
2	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
4	View Tower	1	1,000	1,000	100	1100	0.01	3.00	0.04	0.10	8.33
5	Rock Garden	1	800	800	80	880	0.01	3.00	0.03	0.10	11.11
6	Public Toilet	3	2,000	6,000	600	6600	0.07	3.00	0.21	0.21	3.04
7	Restaurant/Café	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
B	**Bear Zone**										
1	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Guard House	1	600	600	60	660	0.01	3.00	0.02	0.10	14.29
3	Public Toilet	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
C	**Dumsi Malsapromusa & Other Burrowing Animal**										
1	Animal Kitchen	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
	Sub Total			32,200	3,220	35,420	0.373		1.119	1.430	
	Rescue and Hospital zone(RVT6)										
1	Rescue Centre	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
2	Animal Hospital	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
3	Restaurant/Café	1	5,000	5,000	500	5500	0.06	3.00	0.17	0.18	3.10
4	Research Centre	1	2,000	2,000	200	2200	0.02	3.00	0.07	0.10	4.35
5	Public Toilet	3	2,000	6,000	600	6600	0.07	3.00	0.21	0.21	3.04
6	Guard House	1	600	600	60	660	0.01	3.00	0.02	0.10	14.29
	Sub Total			23,600	2,360	25,960	0.273		0.819	0.860	
				202,600	**20,260**	**222,860**	**2.36**		**6.94**	**7.66**	

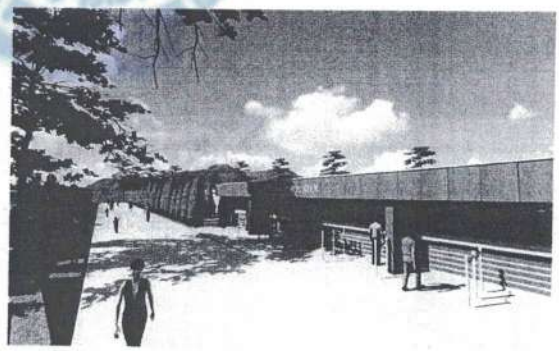
5.1.3 *Administration Area*

- ***Entrance Gate and Guard house***

One main entrance gate and four other secondary gates proposed for the visitors. The main entrance gate is at Dovan and other 4 secondary gates are on Chhirkan, Deurali, Bhumitar and Bhalu Khola. Visitors from secondary gate should be join in main gate for ticketing process but allows free entry for the local people who just want to visit for administration. Guard house will establish aside to gate with the duty of guard 24 hours for security as well as monitoring visitors with tickets and opening and closing gate. The building is proposed single story RCC structure.

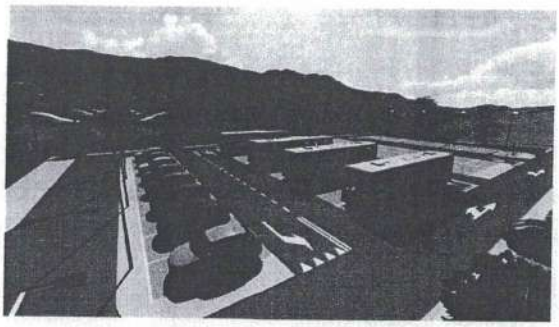
- ***Ticket Counter***

Ticket counter is proposed near the main Gate inside the boundary of the park. Ticket counter will face a window outside where visitors can buy ticket to get in the ZG. A board will be displayed above the building of Ticket counter showing information about the garden and tickets. The building is proposed single story RCC structure. The 4 counters are designed for ticketing.



- ***Parking Area***

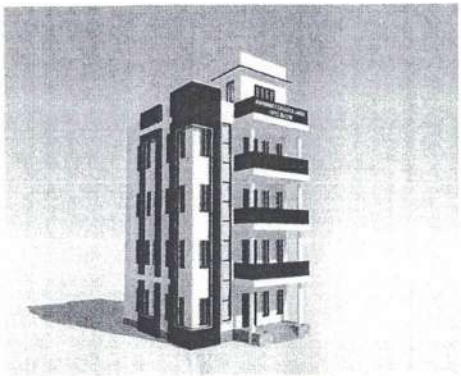
Parking area is proposed inside the administration area main gate on North-West corner. The parking area will accommodate all kinds of vehicles from big buses to small bikes or cycles. The visitors have to park their vehicle in parking area and walk inside. The capacity of the parking area is estimated for 120 cars, 350 bikes and 30 buses one at a time. Three parking areas are proposed.



- *Information Centre*

Information center is proposed nearby ticket counter. Information center will be provided information about the BZG and natural resources audio visual as well as through brochure. This place will also show the importance of the plants and animals available around. Service center will work as the station ready for any repair and maintenance around. The Structure is proposed with single story RCC.

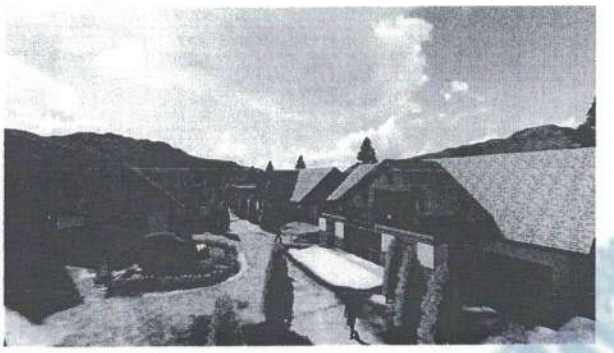
- ***Administrative block***



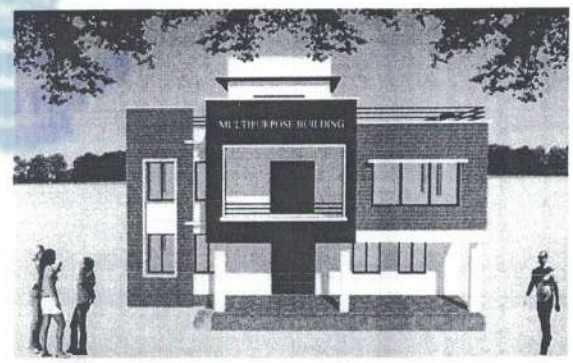
Administrative block is mainly purposed for official work where administrative staff purposed by the government will be work together. The block is managed with official parking surrounding with open garden. A meeting sizes hall (29'3"*13') is also designed inside the block.

- ***Staff Quarter***

Staff quarter lies near to admin building embracing traditional type of one story. 14 numbers of buildings are purposed for the permanent staff with the facilities of Road, Water Supply, Parking, Guard house. These quarters' areas are 300 m away from Office building.

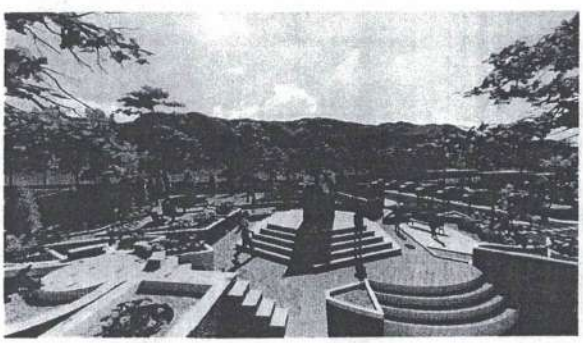


- ***Multipurpose Hall***



A multiple purpose hall is purposed with 2 stories within admin zone with the facilities of Library, Conference Hall and Canteen. It lies in Naubise Phat, Dovan. The hall is access with Road, Water Supply, Parking, Guard house.

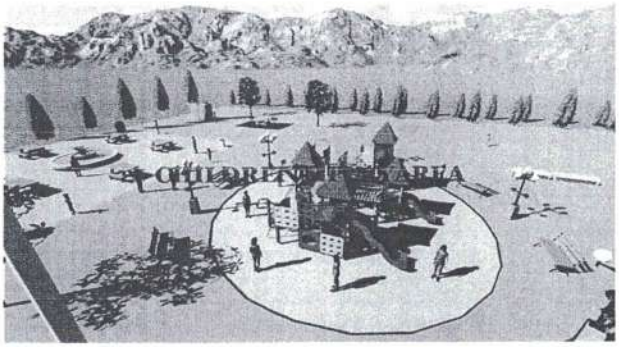
- ***Public Park***



The Public Park is mostly focused just in front of the ticket counter. The existing trees in the forest are protected with very little damage during construction of all type of structures and also more and more tree plantation is prioritized. Flower garden is proposed around the statue of Poetry Bhanubhakta which is proposed middle of the park. Apart from this foot trail and roads in the park are proposed for plantation of special types of flower, carpet grasses, show plants etc. The seating chair around the park is also proposed.

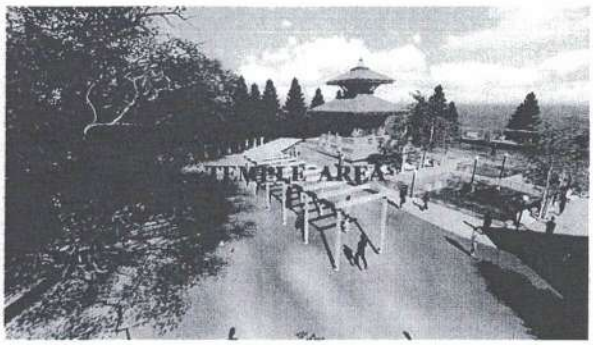
5.1.4 *Exhibit/Display Area*

- ***Children Park***



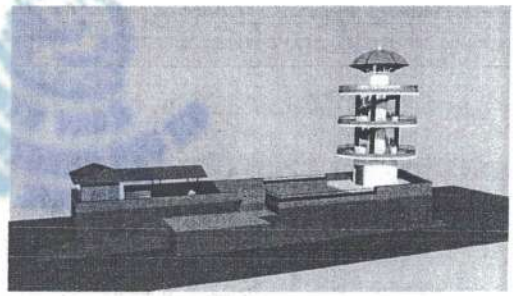
Children are also important portion of visitors who come to the park generally with their parents, so to let the children have fun in the park children playground are proposed with different categories of games, sitting chair etc.

- ***Temple area***



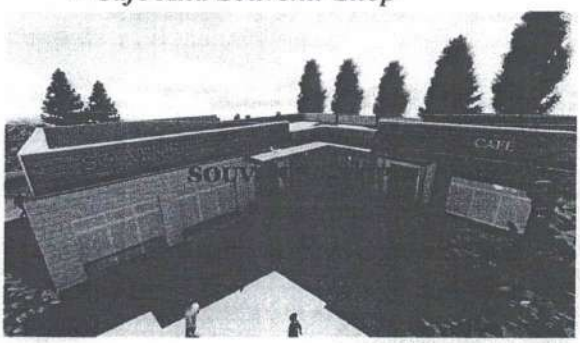
Temple area is located in Naubise phant. The area is famous for the Siddha Baba. Every year many people come for worship. The temple area is purposed with souvenir Shop. The pond is also purpose in front of temple with seating chair. The area is planned for the refreshment after visit of exhibit area.

- ***View Tower***



The view tower is proposed in 6 different sites inside the BZG with RRC frame building of three stories. There will be the provision of binocular at the roof top on two side platform of tower from where the whole beautiful panorama of the ZG can be viewed.

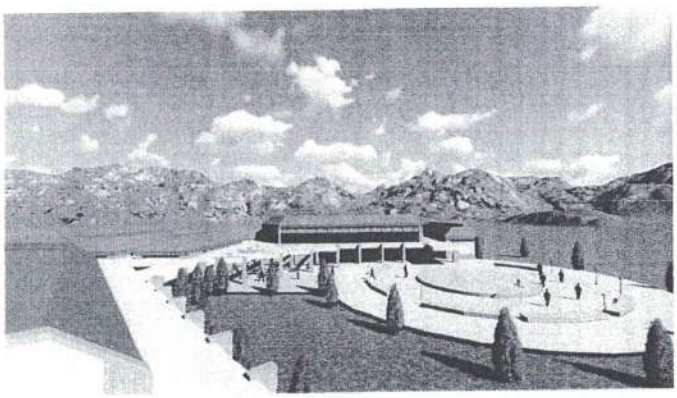
- ***Café And Souvenir Shop***



A building with cafeteria and souvenir shop is proposed Naubise phant inside the park. The shops will be selling some groceries; items for worship as well as one will be dedicated for souvenir shop which will just sell the local products. A cafeteria will also be attached to serve the food for visitors. The building is proposed single story RCC structure. It is also attached with separate ladies and gent restrooms inside. The shop is proposed in each zone.

5.1.5 *Rescue & Research Area*

- ***Research Center***



Hospital is located little bit far from the other area where the roads are connected and access from different sites. Water supply, waste disposal facility is proposed. The hospital is full of equipment and lab facility.

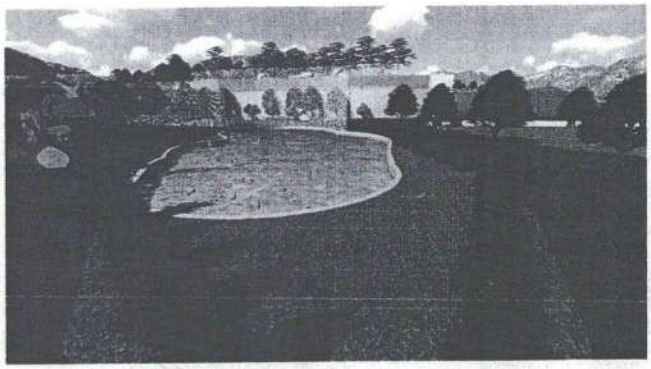
The research center is concerned for the students / professor / researcher who will proceed their research inside. The center is the facility of library and lab too. The parking area is also allocated

- ***Holding Center, Quarantine and Isolation center***

Holding center, Quarantine center and Isolation center will be managed within the rescue and research center. Animals brought from outsider will first kept in holding center and if the problem is seen then they are kept for the quarantine and rest of the animals will kept in isolation center.

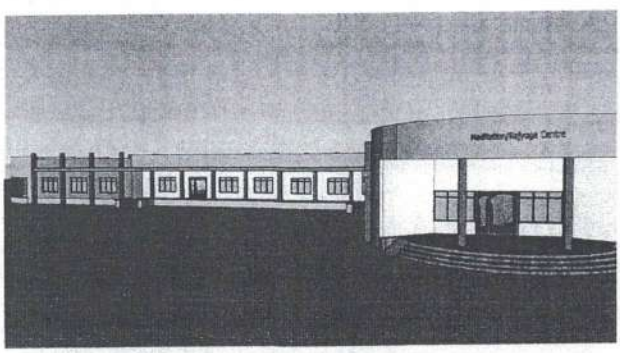
5.1.6 *Peace & Meditation Area*

- ***Pond***



The pond is proposed in each zone for the refreshment with seating chair around. The size of the pond will be designed as per the areas available in zone. Ponds for the aquatic animals have designed separately in herbivore zone. The water supply channel with outlet will be planned.

- ***Meditation building***



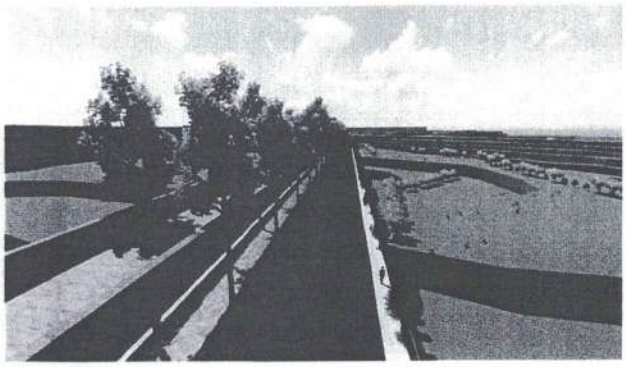
Mediation building is located west part of the BZG. The building is proposed for the mediation or yoga to local people as well as visitors. This area will be very peace with greenery. The building will be of RCC structure of one story with parking facility. The vegetarian canteen is also adjusted in this building.

5.1.7 *Others*

- ***Rock Garden***

The existing huge rock nearby Dumre phant is maintained for the garden named as rock garden. The rock is deposited for many years. It can be developed as selfie point.

- ***Canopy Walk***



Canopy walkways also called canopy walks, treetop walks or treetop walkways provide pedestrian access to a forest canopy. Early walkways consisted of bridges between trees in the canopy of a forest; mostly linked up with platforms inside or around the trees. It provides access to the upper regions of ancient forests for scientists conducting canopy research and makes attraction of tourist as it provide the beautiful view of natural forest. For the visitors who are most interested in birding canopy walkway is one of the good options as the view of birds can be easily seen from canopy walkway.

- ***Waste Management Center or Treatment Plant***

Multiple line of drainage is necessary at certain intervals. As there are existing natural drains on each side of the proposed area, the collected water can be safely disposed on these drains.

The main source of sewerage in the ZG is liquid waste originated from animals. It will be collected by well laid sewerage pipes and poured for the treatment. The solid waste originated from the animals left over feeds and the animal droppings. Bones will be physically collected from the enclosures and brunt in the incinerators. The heaps of animal dung and drooping will be physically collected and dump into the chamber of the sewerage treatment tank. The treatment plants will be planned in such a way that the level of exit of water in the tank should be above the general drain water level.

The degradable and non-degradable solid waste mainly from the canteen, guest house, animal hospital, visitors, and administrator will be categorized. Degradable wastes are managed for the recycling or reused for manure and non-degradable materials like glass, metal and plastics are dumped far from the affective lands.

- ***Wild Animal Enclosures (Semi open type)***

The enclosures are designed as semi open type. Each different species has its specific needs when it comes to housing and caring. It is important to design in a way that it guarantees safety and comfort for more than 200 animals to live, suited for staff to work and visitors to look at.

The master plan drawing presents the planning of different animals, their area, and arrangements considering the above-mentioned safety requirements. Each main gate will be covered by the CCTV coverage and manually regulated by the guards allotted for 24 hours.

Based on the type of animals, their characteristic and other governing factors, their numbers and the available area are suitably proportioned. Various factors were considered during this allocation and design of the space/enclosure. Size of animal, level of activity- (how to provide behavioral enrichment), social grouping (size/structure- family, solitary, sex ratio, etc.), natural habitat, feeding and water requirement, sleeping facilities/shade requirement are the primary consideration. Similarly some factors like security of enclosure, ease of access for maintenance, cleaning, feeding, etc., ease of viewing for health checks, need of suitable off limits areas with appropriate holding facilities (i.e. if breeding is to occur) are also considered. The allocated space for different species of the animals is given in Annex 5.

CHAPTER 6: THEMATIC PLANS

Zoological Garden is a public place where a variety of native and non-native animals are kept for exhibition. The animals kept in the ZG are housed in such a manner that they are easy to observe and study in their natural habitats. The ZG has plan to conserve of species in ex-situ, offering facilities in order to increase scientific knowledge and keep caring sick and injured, orphan and problem animals. It also promotes an increase awareness of the necessity for overall biodiversity conservation as well as ecosystem management and natural resource sustainability. Achieving the entire goal and the objectives, Master plan has determined various thematic plans which is described below:

6.1 Wildlife Management Plan

6.1.1 *Wildlife Collection Plan*

Every Zoo or ZG will take a strategic review of the species of animals and their number to be housed in the Zoo or ZG for preparation of appropriate animal collection plan, the Bhanubhakta ZG will also follow the national policy for the acquisition and collection of animals. While collecting the animals, space available to each species/ animal and space actually required for housing all the animals of all the species will be consider as per prescribed norms. The collected animals will first kept in holding centre than quarantine for the observation.

6.1.2 *Food and Nutrition/Supplements Plan*

All the central kitchen/store is planned near the administrative office of the zoo. The food and supplements will be collected from the clients after tendering process. The quality of the foods has to be checked daily by the Veterinary officer including monitoring team and offered to the animals. Every day after distribution of feed items, kitchen and floor of the store will be duly cleaned.

There will be one kitchen in the store building having gas oven wherein several food items are cooked and delivered to respective keepers for offering the same to the animals of the ZG. There will be a neat finished elevated concrete slab for preparation of food in order to avoid contaminations from the floor. After receiving required food items from the Store Keeper, respective keepers process it on the said elevated slab for offering to the inmates of the ZG. Fodder trees and Napier grass will be planted in conservation zone for the producing good quality fodder to supplement the feeding of ungulates. The details requirement of the food for the wildlife is given in Chapter 7.1.3.

6.1.3 *Veterinary Services*

All animals must be treated with respect, dignity and compassion as well as with thoughtful consideration for their species-typical biology and behavior. In this regards, the injured animals will be rescue and treated in rescue center depending upon the condition/suitability of the individuals. Regular supervision, monitoring and reporting the injured and treated wild animals will be the responsible by veterinary officer. With the coordination of PAs and DFO Authorities rehabilitation of the normal wildlife into their natural habitat is one important task

of veterinary team. Similarly, the capacity building of frontline staff to recognize, record and report disease of poor health condition of animals within the ZG will be the major task.

6.2 Environment and Crisis Management Plan

6.2.1 *Biodiversity Conservation Plan*

Forest is one of the major sources of biodiversity. It is the major habitat for terrestrial biodiversity which includes wild flora and fauna. Biodiversity being a common property engaged on forest protection, management and utilization. Strict protection of the conservation zone is necessary to protect unique biodiversity of mid hill region. Necessary fire line and fire control infrastructures are necessary to protect this zone in its virgin condition.

The ZG possesses a disproportionately rich diversity of flora and fauna at genetic, species and ecosystem levels. The flora and fauna of ZG is the pretty assets which need to conserve from any kind of calamities. Species with important values are preserving in both ex-situ and in-situ ways and attractive species for the visitors are promoted and conserve. Maintaining forest coverage will give positive results regarding biodiversity conservation. In this regards, ZG will provide seedling to local for plantation of multipurpose species annually and they will support for indigenous knowledge practices for biodiversity conservation.

6.2.2 *Solid Waste Management and Waste Water Treatment Plan*

Solid waste generated in and around ZG is the hardship part of the activities if not managed tactfully. The degradable and non-degradable solid waste mainly from the canteen, guest house, animal hospital, visitors, and administrator will be categorized. Degradable wastes are managed for the recycling or reused for manure and non-degradable materials like glass, metal and plastics are dumped far from the affective lands. Apart from this, the activities for preserving the water resources are also accomplished with the involvement of local people.

Multiple line of drainage is proposed at certain intervals for draining in road side and liquid waste originated from animals, will be collected by well laid sewerage pipes and poured for the treatment. The solid waste originated from the animals left over feeds and the animal droppings. Easily indigestible left over feeds like bones will be physically collected from the enclosures and brunt in the incinerators. The heaps of animal dung and drooping will be physically collected and dump into the chamber of the sewerage treatment tank. The treatment plants will be planned in such a way that the level of exit of water in the tank should be above the general drain water level. Marketing options for the solid wastes and other products will be explored with the consultation of experts using cutting edge technology.

6.2.3 *Disaster Risk Reduction Plan*

Seismic risk shall be managed by designing all the structures as per seismic design codes. Further, safe evacuation plans, and safe assembly locations needs to be marked in the design phase. While planning space for animals, it will be planned based on the expected behavior of animals. Fire-alarm and fire-fighting measures will also be appropriately provided based on the location of the structures susceptible to fires. Fire is a critical issue and its vulnerability

assessment and safe action plan will be developed. As, all the structures are to be designed appropriately, and drains and sewerage are provided flooding not expected. The drains need to be assessed for their capacity especially during high precipitation during the design phase. Mitigating the chance from the flood and landslide, bioengineering activities will be promoted.

6.2.4 *Crisis Management Plan*

There may be crisis in management arising out of natural disasters like storm, flood, drought and earthquake or accidental happening like fire, animal escape, outbreak of disease etc. The crisis may also arise out by unruly visitors, strike by staff and stoppage of supply of water, power and animal feed due to circumstances beyond the control of the ZG management. So the nature of the site of the proposed ZG provides a safe setting from the several expected disasters. The proposed master plan, therefore, conceptually provides the framework for the emergency management plan from the natural and manmade hazards. These include: Human organization plan for emergency management, Emergency infrastructure (Control room and media centres), Adequate communication and warning capabilities, Equipment and its storage (for fire, disease outbreaks etc.)

6.2.5 *Fire Management Plan*

Forest fire destroys not only the forest products but reduce the biological diversity also. In addition fire degrades the soil inducing flood and landslide damage thereby reduces aesthetic value for ecotourism. Controlled and prescribed fire must be recommended to the area where the chance of fire is high. The group enjoying inside the ZG will be convinced to take care on fire and prohibiting smoking in the ZG area. So fire prone area should be identified and marked as non-smoking zone. Animal enclosures, main gate, etc. should be provided with fire extinguisher as well as sand buckets for safe guarding against accidents of fire.

6.2.6 *Human Wildlife Conflict Management Plan*

The frequency and intensity of human wildlife conflict mostly arise from crop and livestock depredation, human injuries caused by wildlife, illegal logging, illegal grazing and fodder collection, poaching, and poor relations between local people and protection units. So it is very important to take consideration on protection and mitigation measure.

Human-wildlife conflict mitigation measures are direct methods, such as fencing, guarding, digging trenches, and indirect methods in the form of compensation and incentives, local participation, research, and environmental education. Among all the mitigation measures, electric fences are seen to be the most effective so far in controlling conflicts from the animals.

6.2.7 *Pest and Disease Control*

Pests, including insects, rodents, nuisance birds, and certain mammals, are common in ZG because of the ready availability of shelter, food, and water. Control of pests and disease is a critical aspect of preventive medicine at ZG. Pests are vectors or reservoirs of disease that can adversely affect animals. Pests can also significantly degrade the aesthetic quality of the ZG and cause economic loss from damage to stored foods and to physical facilities.

The most important control activities at ZG will be the integrated pest management wherein natural processes (natural pest mortality factors, pest-predator relationships, and genetic resistance) can be manipulated to maximize their effectiveness. Commonly, chemical controls are used only when natural processes of control fail and in a way that minimizes economic, health, and environmental risks. So promotion of bio-pesticides as alternative to chemical pesticides, conducting regular pest surveillance & monitoring to assess pest/disease situation and isolation of a potentially infected/infested animal, carrier or premises will be the major activities in ZG for pest and disease control.

6.3 Environmental mitigation plan and Framework

The term mitigation is used in environmental review of proposed transportation projects to refer to measures that reduce the project's impact on the environment. The avoidance and minimization of environmental impacts are the goals of mitigation.

Mitigation options are presented for the resource categories that are presumed to "have the greatest potential to restore and maintain environmental functions" (wetlands; streams; wildlife, threatened and endangered species; cultural resources; public recreation areas; and farmlands). In addition, some general discussion of the potential areas to carry out these mitigation options in framework are as follows:

Table 7: Environmental mitigation plan and framework

S. N	Major Issues	Activities/ Mitigation measure	Responsibility Unit	Collaboration with
1	Disaster Risk Reduction	• Seismic risk shall be managed by designing all the structures as per seismic design codes • Plantation of trees and promote bioengineering techniques • Safe evacuation plans, and safe assembly locations needs to be marked in the design phase • Instituting of people-friendly inside the ZG	ZG Unit	DNPWC, Division Forest Office, Local government, District Administration Office, Security Units
2	Crisis Management	• Bringing the wider community together to participate in activities • Informing the community on threats and encouraging them to take preventive measures	ZG Unit	DNPWC, Division Forest Office, Local government, District Administration Office, Security Units
3	Biodiversity Conservation	• Support for Indigenous knowledge (IK) practices, • Provide seedlings to local communities and encourage plantation in such suitable areas	ZG Unit	Local government, Division Forest Office, DNPWC, Universities and Research Institutions

		• Develop conservation awareness material-leaflets/posters of flagship species • Celebrate Conservation Day		
4	Solid Waste and Waste water Management	• Support to manage garbage for polluting items such as plastic bags, bottles • Provide water supply, toilet, drainage, garbage collection pots. • Support local Clubs and communities to organize clean-up campaign, • Promote lime or ash to kill fecal bacteria • Raise awareness on fecal management and disposal of solids through posters, leaflet and flip chart	ZG Unit	DNPWC, Division Forest Office, Local government, District Administration Office
5	Fire Management	• Increase public awareness through IEC material • Enhance capacity of local people • Hire seasonal fire watchers in conservation zone • Construct fire line, watch tower and initiate control burning • Established fire detection mechanism like participatory patrolling, wacky talky, fire extinguisher, fire management tools etc. • Initiate forest management plan close collaboration with community, stakeholders and Government staffs	ZG Unit	DNPWC, Division Forest Office, Local government, District Administration Office, Security Units, Local community
6	Human Wildlife Conflict	• Develop and implement supplementary mitigation strategies. • Aware people from the potential accident, • Aware and share knowledge on proper cropping patterns.	ZG unit local community	DNPWC, Division Forest Office, Local government, District Administration Office, Local community

6.4 Communication, Extension and Promotion

Extension and promotion of ZG is very important for the economic growth. This ZG is newly established and need to publish. Updating the digital database, maps, satellite imaginaries, development of signage will be the important task to delivered quick information. Development of modern devices like digital information display, digital ticketing etc. will be purposed. Broadcast the information, notice etc. through FM radio, publishing the brochure and leaflets are also the major extension and promotion activities. Besides theses, the ZG will celebrate the conservation days inviting the major stakeholders. It will also manage information center with all details of each zone areas and sections. Zoo outreach programs

will be conducted with the collaboration of school and colleges. Friends of zoo developed by Centre Zoo of Lalitpur will be one of the best options for conservation education.
Photographs of new born animals, press release on new acquisition, training camps and any other development related to ZG will be communicated to both print and electronic media through e-mail attached with digital format to large number of agencies and media channels. This would help the ZG to reach out to large public and would attract crowds with little expense in real time.

6.5 Tourism Promotion and Livelihood Plan

Development of tourism in and around the ZG will be the best ways of delivering economic benefits to local people by providing local employment opportunity through different services. Zoological Garden may produce both tangible and intangible environmental services. These services have huge potentiality to contribute in livelihood enhancement of the local people. ZG may contribute to cultural conservation and long-term sustainability of communities and natural resources. Local people outside the area may create a different kind of business services like hotel, guest house, tea shop, cafe, saloon, communication etc. Such activities or the services may generate an employment opportunities to the local. Besides this, cross-cultural activities for the promotion of culture heritage of the local people also the opportunity for income. This will put direct impacts on local economy and national economy. Cultural conservation activities will be implemented to minimize adverse impacts on cultural environment. Workers and visitors will be informed to respect the local culture and customs.

6.6 Human Resource Plan

Skilled and knowledgeable personnel are essential to maintain and up-keep ZG. As time changes the new challenges will emerge and the staff is required to upgrade their skills and potential to handle any eventualities. Capacity Building of different category of office staff and frontline personnel is very essential for better care of animals, providing better nature education and smooth function of the ZG. Similarly, local communities in different categories of business will be trained for the development of tourism.

Implementation of the various activities, caring of wildlife and look after the administration, following human resources and their role and responsibilities are purposed.

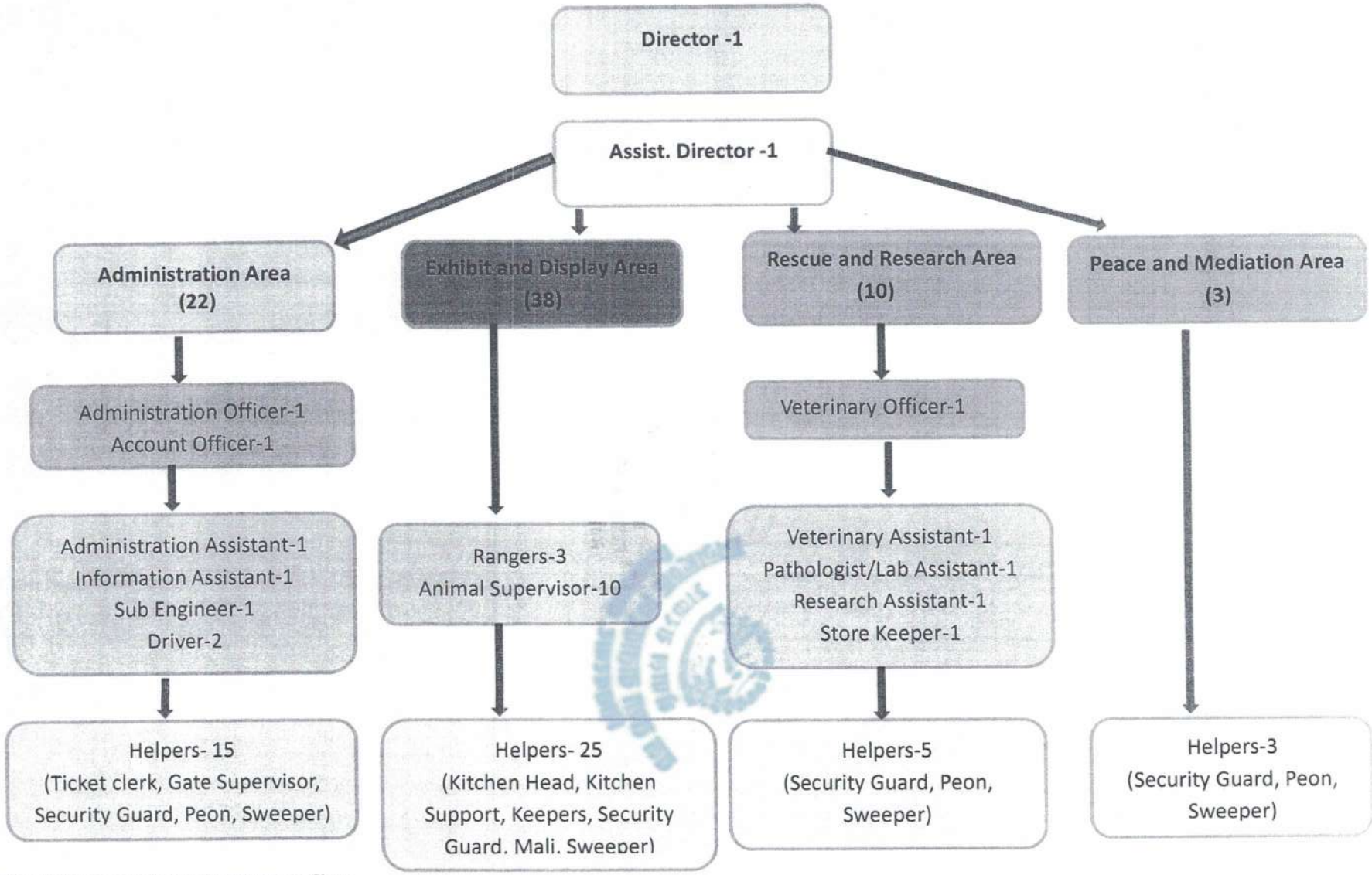


Figure 23: Organization and Management Chart

Director (1):

- Plan and design the construction and modification of animal enclosures, houses, cages etc. and other infrastructure required in order to meet the physiological and biological needs of the animal species.
- Promote educational programs in wildlife and environment conservation.
- Maintain law and order in the Zoological Garden.

Assistant Director (1):

- Responsible for the Animal Section (Maintenance and Security of ZG)
- Supervise and guide all other sub ordinate staff under him.
- Conduct basic and applied research in the field of wildlife health.
- Keep the Director updated about all the day to day activities in the ZG.

Admin and Finance Officer (1):

- Responsible for implementing policies, planning annual budget and managing expenditures,
- Conferring with executives to establish and improve procedures and goals,
- Assigning responsibilities and schedules, establishing work principles and conducting employee evaluations,
- Maintaining inventories and overseeing the ZG directing overall facility maintenance.

Na.Su (1):

- Provides general administration support for ZG team including internal/external enquiries, mail, travel arrangements, procurement processes,
- Coordination / planning, office support and other tasks as required.

Accountant (1):

- Handle finance and account matter of both Plan and Non-Plan, budget estimates.
- Scrutinize flow of recurring and non-recurring expenditure as well as miscellaneous expenditure.
- Check cash book, contingencies, cash ledger, and vouchers and review the progress of expenditure against sanctioned grants.
- Ensure booking of all expenditure and preparation of balance sheet as per the rules.

Sub Accountants (1):

- Sub Accountant will assist to Accountant in budget estimation, maintain cash book, cash ledger and record keeping of any income and expenditures of ZG.

Kharidar/Clerk (8):

- Maintain the records, arrange the logistic support etc.
- Issue gate entry tickets, car entry tickets, guide books, maps etc.
- Deposit of all the revenue with the account section.

- Maintain all the relevant records and submit to the accounts for verification and signing.

Store Keepers (2):

- Receive and check logistic materials, drugs and chemicals, quantity of animal diet articles and other rations from the contractors, its proper storage and timely distribution.
- Ensure proper and safe storage of food items in the store, maintenance of all the types of stock register, daily diet register,
- Take action for timely distribution of the food and fodder from the store,
- Overall supervision sanitation and hygiene i.e. cleaning of roads, footpaths, public conveniences etc.

Curator (1):

- Oversees the zoo's entire animal collection, manages the facility's staff members and completes various administrative tasks.
- Acquiring new animals for the zoo, making decisions involving animal diets, veterinary care, quarantine procedures, enrichment activities, animal transportation, and research projects,
- Reviewing reports from various keepers and compiling that information for zoo records etc.

Rangers (4):

- Patrol the park to check fences, monitor invasive species and visitor activities,
- Plan for developments within parks, including camping areas, recreational areas, tracks, trails and various outdoor activities.
- Represent the ZG and Wildlife on a daily basis and interacting with visitors to inform them of rules and regulations and conducting law enforcement duties
- Responding to emergency situations such as 'search and rescue'

Senior (4) /Game Scout (8):

- Explore the ZG learning about different animal habitats, what each animal needs to help them survive, and if anything is threatening their populations.
- Create their own habitat for an animal, and discuss what they can do to help protect animals in their natural range.
- Monitor on cleaning regularly the animal enclosures, animals wastes, leftout food and undesirable objects etc.
- Ensure timely feeding and watering of animals,
- Report to the superiors about the health condition, feeding condition and other observations immediately,
- Report any damage to the enclosures, cages, structures etc. for immediate repair,
- Carry the different feed items from the store to the respective animal enclosures/cages of the ZG,

- Help to the veterinarians in treating animals manually or through the process of chemical immobilization.

Veterinary Officer (1):

- Plan and establish adequate veterinary facilities in the zoo hospital and submit the details of requirements accordingly.
- Study specific causes of morbidity and mortality and accordingly formulate and adopt measures to prevent diseases among zoo collections.
- Prescribe and check the routine animal diet articles and drinking water quality, checkup health problems and dispense necessary medications, treat sick animals in the enclosures,
- Conduct pathological and microbiological examinations for specific diagnosis of etiology of the condition.
- Conduct post mortem examination and collect specimens for Laboratory investigations,
- Maintain records regarding medical history, procure, maintain and keep records of equipment and medicines, vaccines, reagents and chemical etc.

Veterinary Assistants (2):

- Arrange requisition for handling and operating medical cases.
- Assist Veterinary officer in day to day treatment/dressings and management of surgical and gynecological cases.

Research Assistant (2):

- Support to conduct basic and applied research studies on ecology, physiology and animal biology and behavior,
- Maintain Study books, history cards of various animals.
- Produce various publications like zoo guide books, brochures, handouts, leaflets, annual reports, magazine and management plans, articles, working manuals of animals etc.

Lab Assistant (2):

- Collect of specimens during Necropsy examination and their preparation for microbiological and pathological laboratory examinations.
- Process of relevant samples for detail lab test/examinations,
- Maintenance of museum specimen and up-keep of their history records, lab equipment/instruments in order and maintaining of their log books,
- Assist the Veterinary Officer in taking x-ray radiographs of sick animals
- Develop x-ray films and after results are recorded to preserve them properly along with the results.

Engineer (1):

- Undertake investigation, design and preparation of estimates, drawings with help of Draughtsman for various construction works.

- Prepare Technical Report for the works along with estimates.
- Prepare Schedules along with estimates of any infrastructures of ZG
- Arrange for timely and prompt issue of work order and commencement of works by contractor.
- Inspect the work regularly to ensure quality and timely completion.
- Check the quality of materials used for construction and reject materials below standard.

Sub Engineer-Civil, Electrical, Plumber (3):

- Sub engineer will prepare plan and estimates for all types of civil, electrical, plumber works of the ZG
- Supervise execution of the works of the ZG.
- Record all measurements in respect of any constructional or repairing works and certify the correctness of the same in the contractor's bill.

Information Assistant (1):

- Provide a welcoming, efficient, helpful and informative first point of contact for all enquiries relating to Services,
- Answer enquiries from the public face to face, on the phone or by email, or enrolling new users,
- Promoting and participating in cultural and community events.
- Provide information to tourists on historical sites and scenic places
- Plan and organize tourist itineraries for tourists and visitors.

Gardner (8):

- Undertake the landscaping of the ZG premise,
- Maintain the children parks and other recreational sites for the greenery of the Park.
- Supervise preparation of flower beds, lawn maintenance of nursery including preparation of seedlings & cuttings of various plant species.
- Ensure cleanliness of lawns, roads, pathways etc. of the ZG.

Supervisor (16):

- Supervise the cleanliness and maintenance work of the animal enclosures, cages and surroundings.
- Ensure daily supply of food and water to the animals and submit regular ration requisitions according to the need.
- Record and report daily on health, breeding and feeding conditions of the animals and birds, assist in capturing, crating and transportation of animals, maintain records of all the livestock and inventories of the animals,
- Prepare the animal statement of each month and submit to the Director or authorized officer.

Drivers (4):

- Operate ZG vehicles, ambulance and undertaking its petty maintenance works

- Maintenance of vehicle trolley, log book and any other work assigned by the administration.

Helpers (8):

- Maintain the well-being of animals by performing a number of tasks, such as feeding, watering, and training animals, as well as cleaning and maintaining their habitats. Assist to keepers, assistant, officers and any staff in the zoo.

The management modality of the ZG has not decided yet by the Government. So, human resources management options will be flexible based on management modality.

6.7 Contingency Plan

6.7.1 Animal Rescue

Fragmentation, degradation, and destruction will reduced the living space for wild animals. Natural calamities like forest fires, floods and cyclones have further compounded their problems, hindering their movement to safer habitats. The result of such man made pressures and natural calamities are animals getting displaced from their habitats. So ZG authority upon request is authorized animal rescuer. Rescued wild animals are treated in the Zoo Rescue centre and observed closely so as to release the same to their wild habitat safely.

6.7.2 Escape Animals Management

Every precaution will be taken by the ZG authorities to avoid the escape of the animals from the enclosures. ZG will have preparedness to act after the accidental escape. Tranquilising gun, blow pipes with darts, necessary tranquilising drugs and trained staff will be kept ready. Necessary trap cages shall be kept ready. The alarm system should be in place to alert the security personnel of the zoo to evacuate or cordon off visitors from the site of incident.

6.7.3 Aggression Animal Management

If incidence of fighting amongst animals occur, immediately steps are taken to separate those animals followed by securing them in the respective night shelters. After securing the animals in night shelter, the reason of such fighting is ascertained so as to stop any recurring incidence of fighting among animals. Due to fighting amongst animals if any, animal gets injury, immediately necessary treatment is rendered.

6.7.4 Epidemics

In general, animal diseases, which occur in any specific country or region, fall arbitrarily into one or more of three basic categories, namely indigenous diseases, which are endemic to the country or region and are generally maintained in the livestock herds and /or free-ranging wildlife population, Alien/exotic diseases, which have been introduced into a country or region, usually from the importation of infected animals or animal products emerging, re-emerging or truly novel diseases. Incidence of epidemics of animals of the ZG is very rare as these animals are not exposed to the free living animals. However, some vector borne diseases may occur and turn into epidemic.

If any animal would die in suspected case of epidemic, immediately post-mortem will be carried out to ascertain the disease and the pathological materials will be sent to the Veterinary Laboratory and immediately taken care of.

6.7.5 Alternative Food Storage

Kitchen with cold store will be constructed for storage the food. In case of strike, shortage etc the food will be managed and storage.

6.7.6 Alternative Power Supply

A power backup facility for critical essential area will be provided. Generator set to be installed to run the electronically operated gates, store and office of the ZG. Another set has also been installed at the Veterinary compound for smooth running of all the activities in case of any failure in power supply. Similarly, solar and biogas will also promote if necessary.

CHAPTER 7: COST ESTIMATE

The section describes the methodology used to derive the project cost. The cost estimate is based on the master plan of the project structures carried during this phase. The basis of arriving at a reasonable rate per unit work or supply of particular items are (i) detailed survey of materials, labor, equipment and their prevailing rates and (ii) its specification. Work volumes are estimated based on the drawing. However, some estimates were made upon the suggestion made by the experts.

7.1 Assumptions

Cost is estimated of most of the structures based on the basis of unit prices for each item of works. The following criteria and assumptions are considered:

- Costs are derived in local currency at September 2019 price level.
- All figures are expressed in Nepalese rupees.
- An exchange rate of 1 US$ = NRs. 114 is used for currency conversion.
- Construction equipment costs are included in each item of work.
- The cost and prices are based on the assumption that all goods, materials, and services used in the project will include all local taxes, duties and royalties.

7.1.1 *Pre-Operating Expenses*

Investment before starting project construction period is considered as pre-operating expenses which includes investment on developer's cost, consultant fee for study and design, and investigation, report preparation, staff salary and office expenses, promotional expenses.

Table 8: Pre Operating Expenses

S.N	**Pre Operating Expenses (Pre Implementation Cost)**	**Amount**
1	Administrative Expenses	30,000,000
2	Master Plan and Studies	15,000,000
	Total	45,000,000

7.1.2 *Infrastructure Development Cost*

Infrastructure development is required in order to facilitate the construction & supervision works, transportation of goods, machines and animals. The following budget is allocated for infrastructure development in different zones:

Table 9:Cost estimates for different items in different areas

	Administration area	No.	Unit Area (sqm)	Total Area (sqm)	Cost	Total Cost	Remarks
1	Bhanubhakta Zoological Office Building	1	234.000	234.000	21607794.82	21607794.82	
2	Educational Block	1	104.506	104.506	2502293.82	2502293.82	
3	Parking near office building(P1)	1	1020.000	1020.000	2353956.39	2353956.39	Car=30,Bike=40,Bus=10
4	Guard House	3	64.052	192.157	2705328.51	8115985.53	
5	Staff Quarter Parking (P2)	1	1020.000	1020.000	520537.67	520537.67	Car=30,Bike=40,Bus=10
6	Helipad	1	1277.267	1277.267	680659.58	680659.58	
7	Staff Quarter	14	95.420	1335.880	2799386.65	39191413.10	
8	Main Parking(P3)	1	2990.520	2990.520	6222255.34	6222255.34	Car=120,Bike=350,Bus=30
9	Clinic	1	173.394	173.394	5092172.41	5092172.41	
0	Information Centre	1	90.481	90.481	3248586.82	3248586.82	
1	Multipurpose Hall	1	125.407	125.407	8225756.86	8225756.86	
2	Public Toilet	4	68.850	275.399	2034651.67	8138606.68	
3	Boundary Entrance	1	9.868	9.868	561752.46	561752.46	
4	Main Entrance	1	17.000	17.000	1123504.92	1123504.92	
5	Child Friendly Tap	5	4.000	20.000	26859.69	134298.45	
6	Restaurant/Café	1	647.552	647.552	11285076.75	11285076.75	
7	Ticket Counter	1	131.000	131.000	2961294.57	2961294.57	
8	Statue	1	282.178	282.178	5000000.00	5000000.00	LS
9	Children Park	1	1497.630	1497.630	2000000.00	2000000.00	indiamarg.com
20	Public Park	1	1187.544	1187.544	2500000.00	2500000.00	LS
	Total Structure Area			12071.782			
	Remaining Area			126828.218			
					Sub Total Cost	131465946.2	

no	Peace & Meditation area	No.	Unit Area(sqm)	Total Area(sqm)	Cost	Total Cost	Remarks
1	Pond	1	353.190	353.190	1158247.57	1158247.57	
2	Meditation Centre	1	1260.399	1260.399	36298909.69	36298909.69	
3	Meditation yard	3	95.040	285.120	127250.00	381750.00	
4	Guard House	1	64.052	64.052	2705328.51	2705328.51	
5	Public Toilet	1	68.850	68.850	2034651.67	2034651.67	
6	Child Friendly Tap	2	4.000	8.000	26859.69	53719.38	
7	Restaurant/Café	1	647.552	647.552	11285076.75	11285076.75	
	Total Structure Area			2687.163			
	Remaining Area			85312.837			
					Sub Total Cost	53917683.57	

no	Exhibit/Display area	No.	Unit Area(sqm)	Total Area(sqm)	Cost	Total Cost	Remarks
A.	**Mega Herbivore section**						
1	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
2	Guard House	1	64.0523299	64.052	2705328.51	2705328.51	
3	Gate	1	9.868	9.868	561752.46	561752.46	
4	Breeding Centre	1	672.61	672.610	1553752.50	1553752.50	
5	Enclosure			16400.00			
					Sub Total Cost	7320833.47	
B.	**Herbivore section**						
1	Central Kitchen	1	2146.129	2146.129	29885603.98	29885603.98	
2	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
3	Guard House	3	64.052	192.157	2705328.51	8115985.53	
4	Public Toilet	3	68.850	206.549	2034651.67	6103955.01	
5	Child Friendly Tap	4	4	16.000	26859.69	107438.76	
6	Pond	1	353.19	353.190	1158247.57	1158247.57	
7	Mandir	1	64.743	64.743	1751068.49	1751068.49	
8	Multipurpose Hall	1	250.814	250.814	16451513.72	16451513.72	

9	Children Park	1	1375	1375.000	2000000.00	2000000.00	
10	Restaurant/Café & Souvenir Shop	1	647.552	647.552	11285076.75	11285076.75	
11	View Tower	1	71.250	71.250	1985970.86	1985970.86	
12	Restaurant/Café	1	647.552	647.552	11285076.75	11285076.75	
13	Enclosure			19400.00			
					Sub Total Cost	92629937.42	
C	**Carnivore section**						
1	Guard House	3	64.052	192.157	2705328.51	8115985.53	
2	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
3	Child Friendly Tap	4	4	16.000	26859.69	107438.76	
4	Pond	2	353.19	706.380	1158247.57	2316495.14	
5	View Tower	1	71.250	71.250	1985970.86	1985970.86	
6	Rock ZG	1	111.677	111.677	2500000.00	2500000.00	
7	Public Toilet	3	68.850	206.549	2034651.67	6103955.01	
	Restaurant/Café	1	647.552	647.552	11285076.75	11285076.75	
8	Enclosure			25300.000			
					Sub Total Cost	34914922.05	
D	**Avifauna section**						
1	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
2	Public Toilet	3	68.850	206.549	2034651.67	6103955.01	
3	Pond	1	353.19	353.190	1158247.57	1158247.57	
4	Enclosure			12500.000			
					Sub Total Cost	9762202.58	
E	**Omnivorous section**						
1	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
2	Public Toilet	1	68.850	68.850	2034651.67	2034651.67	
3	Guard House	1	64.052	64.052	2705328.51	2705328.51	
4	Restaurant/Café	1	647.552	647.552	11285076.75	11285076.75	
4	Enclosure			8400.00			

					Sub Total Cost	18525056.93	
F	**Harpetofauna section**						
1	Pond	3	353.19	1059.570	1158247.57	3474742.71	
2	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
3	Public Toilet	1	68.850	68.850	2034651.67	2034651.67	
4	Enclosure			7900.00			
					Sub Total Cost	8009394.38	
G	**Bear section**						
1	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
2	Guard House	1	64.052	64.052	2705328.51	2705328.51	
3	Public Toilet	1	68.850	68.850	2034651.67	2034651.67	
4	Child Friendly Tap	1	4	4.000	26859.69	26859.69	
5	Enclosure			10000.00			
					Sub Total Cost	7266839.87	
H	**Porcupine Mangoose & Other Burrowing Animal**						
1	Animal Kitchen	1	672.61	672.610	2500000.00	2500000.00	
2	Enclosure			5200.00			
	Total Structure Area			21855.426			
	Remaining Area			974844.574			
					Sub Total Cost	2500000.00	

no	**Rescue & Research area**	**No.**	**Unit Area (sqm)**	**Total Area(sqm)**	**Cost**		
1	Rescue Centre	1	2508.4	2508.400	10219613.17	10219613.17	
2	Pond	1	353.19	353.190	1158247.57	1158247.57	
3	Animal Hospital	1	192.29	192.290	729687.43	729687.43	
4	Restaurant/Café	1	647.552	647.552	11285076.75	11285076.75	
5	Research Centre	1	202.86	202.860	5004587.64	5004587.64	
6	Public Toilet	3	68.850	206.549	2034651.67	6103955.01	

7	Child Friendly Tap	4	4	16.000	26859.69	107438.76	
8	Guard House	1	64.052	64.052	2705328.51	2705328.51	
9	Enclosure			129.29			
	Total Structure Area			4320.183			
	Remaining Area			47379.817			
					Sub Total Cost	37313934.84	
no	**Additional Structure**						
1	Fencing	1	24 km		53199508.9	53199508.9	
2	Waste Management Centre	1	672.61		4000000.00	4000000.00	
4	Boundary entrance gate	4	9.868		561752.46	2247009.84	
					Sub Total Cost	59446518.74	
no	**Roads**						
1	Main Road	1	23		45000000.00	1042920000.00	
2	Service Road	1	25.15		20000000.00	503000000.00	
3	Trail Road	1	1.7		1000000.00	1700000.00	
					Sub Total Cost	1547620000.00	
			Total Cost			**2010693270.00**	

Others	
N	**Project**
1	Mono-Rail
2	Cable Car/Ropeway
3	Canopy Walk
4	Gorge Walk/Jeep Flier

7.1.3 *Cost Estimate of Foods for Animals in a Year*

The food and nutrition to wildlife will be managed through the tendering process. The cost of the food for each animal in a day is estimated below

Table 10: Cost estimate of foods for animal in a year

Estimated Food Expenses for Wildlife Animals in a Year								
	Mammals	**Habit**	**Habitat**	**Purposed Number**	**Cost/day/No**	**Cost by No**	**Total Cost in Year**	**Major Foods**
	Hare (Indian, Hispid) -2	H	T	2	11.64	23.28	8497.2	Gram, Carrot, Potato, cabbage etc.
	Marmot (Himalayan, Bobak)-2	H	T	2	11.64	23.28	8497.2	Gram, Carrot, Potato, cabbage etc.
	Squirrel (Red giant flying, Northern Palm, Irrawaddy, Black Giant, Orange-bellied Himalayan) -5	H	Ar/T	5	7.59	37.95	13851.75	Unhusked Rice, Gram, peanut, carrot, etc.
	Porcupine (Indian Crested, Malayan) -2	C/H/O	T	2	67.6	135.2	49348	Maize, Gram, Peanuts, Carrot, Pumpkins, Apple Potato bread etc.
	Pangolin (Indian and Chinese) -2	C	T	2	100	200	73000	Insects,
	Shrew (Asian House, Himalayan water, Elegant Water) -3	C/H/O	T	3	117.25	351.75	128388.75	Fruits, Meat
	Jungle cat	C	T	2	105	210	76650	Meat
	Fishing Cat	C	T/A	2	90	180	65700	Fist, Meat
	Leopard cat	C	T	1	90	90	32850	Meat (chicken)
0	Clouded leopard	C	T	1	582.15	582.15	212484.75	Meat
1	Snow leopard	C	T	1	582.15	582.15	212484.75	Meat (Buff)
2	Tiger	C	T	2	2160	4320	1576800	Meat (Buff)
3	Leopard	C	T	1	540	540	197100	Meat (Buff)
4	Mongoose (Small Indian, Indian grey, Crab-eating) -3	C/H/O	T	3	100	300	109500	Insects, crabs, earthworms, lizards, birds, eggs etc.
5	Bengal fox, Red fox, Spotted Linsang - 3	C	T	3	135	405	147825	Meat

6	Rat (Turkestan, House, Brown, Indian Bush, Eastern House, Fawn coloured, Little Indian Field) -7	C	T	7	100	700	255500	Meat
7	Jackal	C/H/O	T	1	135	135	49275	Meat
8	Grey wolf or Wild Dog	C	T	1	510	510	186150	Meat
9	Striped hyena	C	T	2	510	1020	372300	Meat
0	Himalayan black bear	C/H/O	T	1	429.56	429.56	156789.4	Molasses, Corn Flour, Peanuts, fruits, Green Veg, Bread, Egg, honey
1	Sloth bear	C/H/O	T	1	419.56	419.56	153139.4	Molasses, Corn Flour, Peanuts, fruits, Green Veg, Bread, Egg
2	Otter	C	T/A	2	150	300	109500	Fish, frogs, Crabs etc.
3	Yellow throated marten, Siberian Weasel -2	C	T	2	100	200	73000	rats, mice, hares, snakes, lizards, eggs
4	Red panda, Hogbadger, Honey Badger - 3	C/H	T	3	84.5	253.5	92527.5	Fruits, Bread, Milk
5	Bats (Flying fox, Intermediate Horseshoe, Roundleaf, Pipistrelle, Noctule) – 5	H	Ar	5	135	675	246375	Gram, Peanuts, Fruits, Green Veg, Bread
6	Langurs (Complex, Terai Grey, Nepal Grey)-3	C/H	Ar/T	3	128.95	386.85	141200.25	Gram, Peanuts, Fruits, Green Veg, Bread
7	Rhesus monkey	C/H	Ar/T	2	34.82	69.64	25418.6	Gram, Peanuts, Fruits, Green Veg, Bread
8	Assamese monkey	C/H	Ar/T	2	69.65	139.3	50844.5	Gram, Peanuts, Fruits, Green Veg, Bread
9	Wild boar	C/H	T	2	159.33	318.66	116310.9	Gram, Pea, Soybean, Fruits, Green Veg, Bread
0	Musk deer (Alpine and Himalayan) -2	H	T	2	101	202	73730	Gram, Pea, Soybean, Fruits, Green Veg, Bread
1	Barking deer	H	T	4	56.63	226.52	82679.8	Maize, Gram, Soybean, Bran, Wheat,
2	Swamp deer	H	T	4	148.46	593.84	216751.6	Gram, Pea, Soybean, Fruits, Green Veg, Bread

3	Sambar deer	H	T	4	148.46	593.84	216751.6	Maize, Gram, Soybean, Bran, Wheat,
4	Chital	H	T	4	71.31	285.24	104112.6	Maize, Gram, Soybean, Bran, Wheat,
5	Hog deer	H	T	2	148.46	296.92	108375.8	Gram, Pea, Soybean, Fruits, Green Veg, Bread
6	Blue bull/ Nilgai	H	T	2	210.45	420.9	153628.5	Maize, Gram, Soybean, Straw, Green Veg,
7	Four-horned antelope	H	T	2	134.9	269.8	98477	Maize, Gram, Soybean, Bran, Wheat,
8	Black buck	H	T	2	60.56	121.12	44208.8	Maize, Gram, Soybean, Bran, Wheat,
9	Blue sheep	H	T	2	180.96	361.92	132100.8	Maize, Gram, Soybean, Bran, Wheat, Banana
0	Himalayan thar	H	T	2	180.96	361.92	132100.8	Gram, Pea, Soybean, Fruits, Green Veg, Bread
1	Goral	H	T	2	180.96	361.92	132100.8	Maize, Gram, Soya bean, Straw, Green Veg,
2	Himalayan serow (Thaar)	H	T	2	180.96	361.92	132100.8	Gram, Pea, soya bean, Fruits, Green Veg, Bread
3	Gaur	H	T	2	390.13	780.26	284794.9	Gram, Pea, Soybean, Fruits, Green Veg, Bread
4	Water buffalo/ Arna	H	T/A	2	390.13	780.26	284794.9	Maize, Gram, Soybean, Straw,
5	Kiang/ Wild ass	H	T	2	134.9	269.8	98477	Fruits, Green veg,
6	Rhinoceros	H	T/A	2	1108.19	2216.38	808978.7	Maize, Gram, Gram, wheat, maize Flour Banana, Green Veg
7	Wild elephant	H	T	2	923.6	1847.2	674228	Unhusked Rice, Molasses, Straw, Green Veg
							8719700.35	
					Reptiles			
1	Turtle (Indian Eye, Crown river, Three Striped Roofed, Red Crowned Roofed, Black Pond) -5	C/H/O	T/A	5	11.45	57.25	20896.25	Green Veg, Fruits
2	Mugger	C	T/A	2	400	800	292000	Meat
3	Gharial	C	T/A	2	300	600	219000	Fish

	Monitor (Golden, Bengal) -2	C	T/A	2	54.5	109	39785	Meat, Eggs
	Poisonous Snakes (Python, Common Cobra, King Cobra, Common Krait, Banded Krait, Russell's Viper) -6	C	/TA	6	400	2400	876000	Meat, Fish
	Non Poisonous Snakes	C	T/A	15	100	1500	547500	Meat fish
							1995181.25	
				Fish				
1	Surface Dwellings Native species	C/H	A	20	50	1000	365000	insects, crawfish, benthic worms.
2	Carps and Other Commercial Verities (rohu, catla, mrigal, Ashla, mahseer, rainbow trout, grass carps, Chinese, Carps) -8	C/H	A	8	50	400	146000	insects, crawfish, benthic worms.
							511000	
				Avifauna (Birds and Butterflies)				
1	Ducks, Cranes, Cormorants, Storks, Egrets	C/H/O	T/A	20	88	1760	642400	
2	Kalij, monal, danfe, chilime, phukras, chukor	C/H/O	T	8	57.66	461.28	168367.2	
3	Babbler (Spiny, Black Chinese, Jungle) -3	C/H/O	T	3	90	270	98550	
4	Vultures (Oriental White Backed, Eurasian Griffon, Long billed, Red Headed) -4	C	T	4	90	360	131400	
5	Owlet (Asian Barred, Jungle, Spotted, Eurasian Eagle, Brown Fish) -5	C	T	5	90	450	164250	
6	Hornbills (Great, Rhinoceros, Indian Grey) -3	H	T	3	90	270	98550	
7	Eagle (Imperial, Steppe, Golden) - 3	C	T	3	54	162	59130	

8	Wood Peaker (Rufuos, Greater Yellow Naped, Grey Headed, Pale Headed) -4	C/H	T/A	4	43	172	62780	
9	Peacock	H/C	T	2	56	112	40880	
10	Talking Birds (Common Mynah, Jungle Mynah, Parrot) -3	H	T/Ar	3	68	204	74460	
11	Sarus Crane	C/H	T	2	54	108	39420	
12	Barbet (Blue throtened, Blue eared, Great, Copper Smith) -4	C/H	T	4	56	224	81760	
13	Martin (Plain, Sand, Nepal House) -3	C/H	T	3	56	168	61320	
14	Warbler (Golden Spectacled, Grey wooded, Greenish) -3	C/H	T	3	56	168	61320	
15	Beetles (Leaf, Tiger, Long horned, rhinoceros) -4						0	
16	Butterfly						0	
							1784587.2	
	Amphibians							
1	Himalayan newt	C	T/A	5	20	100	36500	
2	Toads (Burmese spadefoot, Himalayan, Black-spined)-3	C	T/A	3	20	60	21900	
3	Paahaa (Nepal, Tiny, Small paa frog) -3	C	T/A	3	20	60	21900	
4	Surface Dwellings Native species (Fish-20)	C	T/A	20	20	400	146000	
5	Frogs (Sikkimese caecilian, Giant treefrog, Chunam frog, Indian burrowing frog, Skittering frog, Tiger frog, Indian balloon frog, -7	C	T/A	7	20	140	51100	
							277400	
	Total Food and Forage						**13287869**	
	Straw (75Rs*25Spps*365days)						**684375**	

	Food Enrichments/Nutrients and medicines						**300000**	
	Other Live animals						**500000**	
	Grant total for Food						**14772244**	

7.1.4 *Cost Calculation of Water supply*

Table 11: Cost calculation of water supply

TRANSMISSION LINE

S.N.	Particulars	Length	Cost
1	RVT2 to RVT 3	1136.295	340888.5
2	RVT 3 to RVT 4	727.3595	218207.85
3	Source to RVT 4	1499.5261	449857.83
4	From RVT1	2682.8991	804869.73
5	RVT 4 to RVT 5	2108.1363	632440.89
6	From RVT5	1133.714	340114.2
Sum		**9287.93**	**2786379**

DISTRIBUTION LINE

S.N.	Particulars	Length	Cost
1	RVT1	15000	1500000
2	RVT2	2300	230000
3	RVT3	8500	850000
4	RVT4	7720	772000
5	RVT5	2500	250000
Sum		**36020**	**3602000**

S.N.	Particulars	Size	Cost
1	RVT1(RCC)	75	1292189.256
2	RVT2	12	224254.6791
3	RVT3(RCC)	75	1292189.256
4	RVT4(RCC)	32	1011087.744
5	RVT5	12	224254.6791
Sum			**4043975.614**
Total Cost(NRs.)			**10432354.61**

7.1.5 *Cost Estimate of Enclosures*

Similarly, infrastructure development is required in order to keep the animals with safety. The following budget is allocated for the enclosures:

Table 12: Cost Estimates of Enclosures

S.N	Species	Habit	Habitat	Gross Area (Sq.m)	Rate	Total Cost
Insects						**3000000**
1	Beetles (Leaf, Tiger, Long horned, rhinoceros)	C/H	T	300	5000	1500000
2	Butterflies	H	T	300	5000	1500000
				600		
Fish						**48000000**

1	Surface Dwellings Native species	C/H	A	3000	8000	24000000
2	Carps and Other Commercial Verities (rohu, catla, mrigal, Ashla, mahseer, rainbow trout, grass carps, Chinese, Carps)	C/H	A	3000	8000	24000000
				6000		
Amphibians						**9500000**
1	Himalayan newt	C	T/A	300	5000	1500000
2	Toads(Burmese spadefoot, Himalayan, Black-spined)-	C	T/A	300	5000	1500000
3	Paahaa (Nepal, Tiny, Small paa frog)	C	T/A	500	5000	2500000
4	Carps and Other Commercial Verities (rohu, catla, mrigal, Ashla, mahseer, rainbow trout, grass carps, Chinese, Carps)	C	T/A	500	5000	2500000
5	Frogs (Sikkimese caecilian, Giant treefrog, Chunam frog, Indian burrowing frog, Skittering frog, Tiger frog, Indian balloon frog	C	T/A	500	5000	2500000
				2100		
Reptiles						**37000000**
1	Turtle (Indian Eye, Crown river, Three Striped Roofed, Red Crowned Roofed, Black Pond)	C/H/O	T/A	800	10000	8000000
2	Mugger	C	T/A	500	10000	5000000
3	Gharial	C	T/A	500	10000	5000000
4	Monitor (Golden, Bengal)	C	T/A	300	10000	3000000
5	Poisonous Snakes(Python, Common Cobra, King Cobra, Common Krait, Banded Krait, Russell's Viper)	C	A	1100	10000	11000000
6	Non Poisonous Snakes	C	T/A	500	10000	5000000
				3700		
Birds						**59500000**
1	Ducks, Cranes, Cormorants, Storks, Egrets etc	C/H/O	T/A	3000	5000	15000000
2	Kalij, monal, danfe, chilime, phukras, chukor etc	C/H/O	T	3000	5000	15000000
3	Babbler (Spiny, Black Chinese, Jungle)	C/H/O	T	500	5000	2500000
4	Vultures (Oriental White Backed, Eurasian Griffon, Long billed, Red	C	T	2000	5000	10000000

	Headed)					
5	Owlet (Asian Barred, Jungle, Spotted, Eurasian Eagle, Brown Fish)	C	T	1000	5000	5000000
6	Hornbills (Great, Rhinoceros, Indian Grey)	H	T	500	5000	2500000
7	Eagle (Imperial, Steppe, Golden)	C	T	500	5000	2500000
8	Warbler (Golden Spectacled, Grey wooded, Greenish)	C/H	T/A	100	5000	500000
9	Peacock	H/C	T	500	5000	2500000
10	Talking Birds (Common Mynah, Jungle Mynah, Parrot)	H	T/Ar	300	5000	1500000
11	Sarus Crane	C/H	T	500	5000	2500000
12	Barbet (Blue throtened, Blue eared, Great, Copper Smith)	C/H	T/A	100	5000	500000
13	Wood Peaker (Rufuos, Greater Yellow Naped, Grey Headed, Pale Headed)	C/H	T/A	100	5000	500000
				12100		
Mammals						**1201500000**
1	Hare (Indian, Hispid)	H	T	600	15000	9000000
2	Marmot (Himalayan, Bobak)-	H	T	600	15000	9000000
3	Squirrel (Red giant flying, Northern Palm, Irrawaddy, Black Giant, Orange-bellied Himalayan)	H	Ar/T	300	15000	4500000
4	Porcupine (Indian Crested, Malayan)	C/H/O	T	1000	15000	15000000
5	Pangolin (Indian and Chinese)	C	T	1000	15000	15000000
6	Rat (Turkestan, House, Brown, Indian Bush, Eastern House, Fawn coloured, Little Indian Field)			300	15000	4500000
7	Shrew (Asian House, Himalayan water, Elegant Water)			300	15000	4500000
8	Common/ Asian palm civet	C/H/O	T	300	15000	4500000
9	Jungle cat	C	T	300	15000	4500000
10	Fishing Cat	C	T/A	500	15000	7500000
11	Leopard cat	C	T	500	15000	7500000
12	Clouded leopard	C	T	1000	15000	15000000
13	Snow leopard	C	T	1500	15000	22500000
14	Tiger	C	T	8000	15000	120000000
15	Leopard	C	T	5000	15000	75000000
16	Mongoose (Small Indian, Indian grey, Crab-eating)	C/H/O	T	800	15000	12000000
17	Bengal fox, Red fox, Spotted Linsang	C	T	600	15000	9000000

18						
19	Jackal	C/H/O	T	500	15000	7500000
20	Grey wolf or Wild dog	C	T	3000	15000	45000000
21	Striped hyena	C	T	1500	15000	22500000
22	Himalayan black bear	C/H/O	T	5000	15000	75000000
23	Sloth bear	C/H/O	T	5000	15000	75000000
24	Otter	C	T/A	1000	15000	15000000
25	Yellow throated marten, Siberian Weasel	C	T	500	15000	7500000
26	Red panda, Hogbadger, Honey Badger	C/H	T	1000	15000	15000000
27	Bats (Flying fox, Intermediate Horseshoe, Roundleaf, Pipistrelle, Noctule).	H	Ar	500	15000	7500000
28	Langurs (Complex, Terai Grey, Nepal Grey)	C/H	Ar/T	1600	15000	24000000
29	Rhesus monkey	C/H	Ar/T	1500	15000	22500000
30	Assamese monkey	C/H	Ar/T	1600	15000	24000000
31	Wild boar	C/H	T	1000	15000	15000000
32	Musk deer (Alpine and Himalayan)	H	T	1000	15000	15000000
33	Barking deer	H	T	800	15000	12000000
34	Swamp deer	H	T	1000	15000	15000000
35	Sambar deer	H	T	1500	15000	22500000
36	Chital	H	T	1500	6000	9000000
37	Hog deer	H	T	1200	15000	18000000
38	Blue bull/ Nilgai	H	T	1500	15000	22500000
39	Four-horned antelope	H	T	1000	15000	15000000
40	Black buck	H	T	1400	15000	21000000
41	Blue sheep	H	T	2000	15000	30000000
42	Himalayan thar	H	T	2000	15000	30000000
43	Goral	H	T	900	15000	13500000
44	Himalayan serow (Thaar)	H	T	1000	15000	15000000
45	Gaur	H	T	1500	15000	22500000
46	Water buffalo/ Arna	H	T/A	2200	15000	33000000
47	Kiang/ Wild ass	H	T	1200	15000	18000000
48	Rhinoceros	H	T/A	5000	15000	75000000
49	Wild elephant	H	T	8000	15000	120000000
				81000		
	Total			**105500**		**1358500000**

7.1.6 *Initial Project Management, Engineering and Supervision Cost*

There will be a dedicated team for construction supervision and management. The consultants and expert visits shall be occasional as per the need of the project. The site office and head office shall coordinate resources for the successful construction and operation of the project. The total budget is allocated for project management and supervision cost for 18

months of project construction. This is based on monthly expenditure for 18 months only. This cost also includes the consultancy fees and charges for DPR and project supervision.

Table 13: Initial Project Management Cost

Project Management & Supervision	Month	Rate	Amount (Rs.)
Management (Kathmandu)	3	500,000	15,00,00,000
Site management and supervision	3	1,000,000	30,00,00,000
Engineering and maintenance Cost	3	500,000	15,00,00,000
Operation and office expense	3	1,500,000	45,00,00,000
DPR Cost		4,00,00,000	4,00,00,000
Total			**1,09,00,00,000**

7.1.7 *Management and operation Cost*

Management and Operating costs are expenses associated with the maintenance, administration, environmental and others related costs. The management cost for the ZG is concerned to awareness, extension and promotion also. The initial management and operating cost of the ZG is estimated below:

Table 14: Management and Operation Cost

1	**Management and Operation Cost**	**40180294**
A	Institutional and Administration Cost	22908050
B	Wild life Food enrichment and Management Cost	14772244
C	Environment and crisis management cost	1500000
D	Communication, Extension and Promotion	1000000
E	Procurement of equipment, tools and logistic etc.	1000000

7.1.8 *Administration Cost*

The human resources for the administration, conservation, veterinary and engineering sections are proposed with 81 personnel for the effectiveness implementation of activities determined in Master plan. The cost of human resources for one year is estimated below:

Table 15: Administration Cost

Administration Cost

Administration Area	Number	Rate	Months	Amount
Director	1	40380	13	524940
Assistant Director	1	35990	13	467870
Admin and finance officer	1	35990	13	467870
Curator	1	35990	13	467870
Veterinary Officer	1	35990	13	467870
Engineer	1	35990	13	467870
Na.Su	1	28200	13	366600
Accountant	1	28200	13	366600
Sub Accountant	1	26610	13	345930
Kharidar/Clerk	8	26610	13	2767440

Store Keeper	2	26610	13	691860
Ranger	4	26610	13	1383720
Senior game scout	4	26610	13	1383720
Game Scout	8	20680	13	2150720
Veterinary Assistant	2	28200	13	733200
Lab Assistant	2	28200	13	733200
Research Assistant	2	28200	13	733200
Sub Engineer (Civil)	1	28200	13	366600
Sub Engineer (Electrical)	1	28200	13	366600
Sub Engineer (Plumber	1	28200	13	366600
IT Assistant	1	28200	13	366600
Gardner	8	20680	13	2150720
Supervisor	16	22010	13	4578080
Driver	4	22010	13	1144520
Helper	8	20680	13	2150720
Sub Total	**81**			**26010920**
Coordination	**LS**			**1000000**
Grand Total				**27010920**

7.1.9 *Community Development, Capacity Building and Income Generation*

Achieve the goal and objectives of the master plan, human resources are mobilize and their capacity are very important. Here some major training, education and other activities are proposed with cost estimates:

Table 16: Community development, capacity building and income generation cost

S.N	Activities	Frequency	Unit	Rate	Amount (Rs.)
1	Training to local people (entrepreneurship development, nature guide, hospitality etc.)	3	Acti/Yr	150,000	450,000
2	Training to staff (wildlife handling, forensic, rescue, visitor management,	2	Acti/Yr	150,000	300,000
3	Non-formal education (visit, excursion)	2	Acti/Yr	75,000	150,000
4	Local Development activities (micro-enterprise development, diversification of products)	3	Acti/Yr	200,000	600,000
	Total				**1,500,000**

CHAPTER 8: BUSINESS PLAN

The cost of conservation may not be justified based on cost benefit analysis. This center will be developed to manage problem wild animals of Gandaki Province. With input from experts, planners and stakeholders a general business plan has been developed striving to provide unique and personalized best quality services to its customers, promote internal and external tourism, enhance socio-economic value to the society, thus contributing towards the economic prosperity of the country. However, a detail business plan has to further develop in detail designing stage. The project aims at enhancing the stakeholder value by taking human and nature friendly professional approach, exceeding the expectations of its customers and continuously improvising on the understanding of overall "beings" in and around the area.

Bhanubhakta ZG is at a strategically advantageous location at the mid of hill reaching to Pokhara from Kathmandu surrounded by diverse species of flora and fauna within settlement around it.

8.1. Target Market

A target market is a group of customers within a business's serviceable available market at which a business aims its marketing efforts and resources. A target market is a subset of the total market for a product or service. The market generally falls into two broad type namely Consumer markets and Business Market. Here, Consumer markets are basically consist where individuals or households who purchase goods for private consumption and do not intend to resell those goods for a profit. The major consumer segment or markets of the ZG will be the value of the followings:

- Eco-friendly concept close to nature
- High quality service
- Unique and differentiated experience
- Diverse Species
- Peace and good environment

Followings shall be the potential customer segments of the ZG as seen from the perspective of segments of tourism industry customers in Nepal:

8.1.1 Individual and Personal Group Customers

These are the customers of the ZG who shall visit there for the fulfillment of personal need of recreation, amusement and study. They generally come with existing social circle (family/relatives/friends/colleagues) or special purpose group coming individually. These types of customers are sensitive towards creative marketing and referral extended by some reference group with good credibility.

Tourists are mainly categorized into three different sectors and the fees from them are also varied.

- Foreign Tourists
- SAARC Tourists
- Nepalese Tourists

The projections of visitors in BZG are:

Table 17: Projection of Visitors

S.N	Particulars	Unit	Yearly Projected	Per Day Projection
1	Local Visitors	Person	180000	493
2	SAARC Visitors	Person	13000	36
3	Foreigner	Person	87000	238

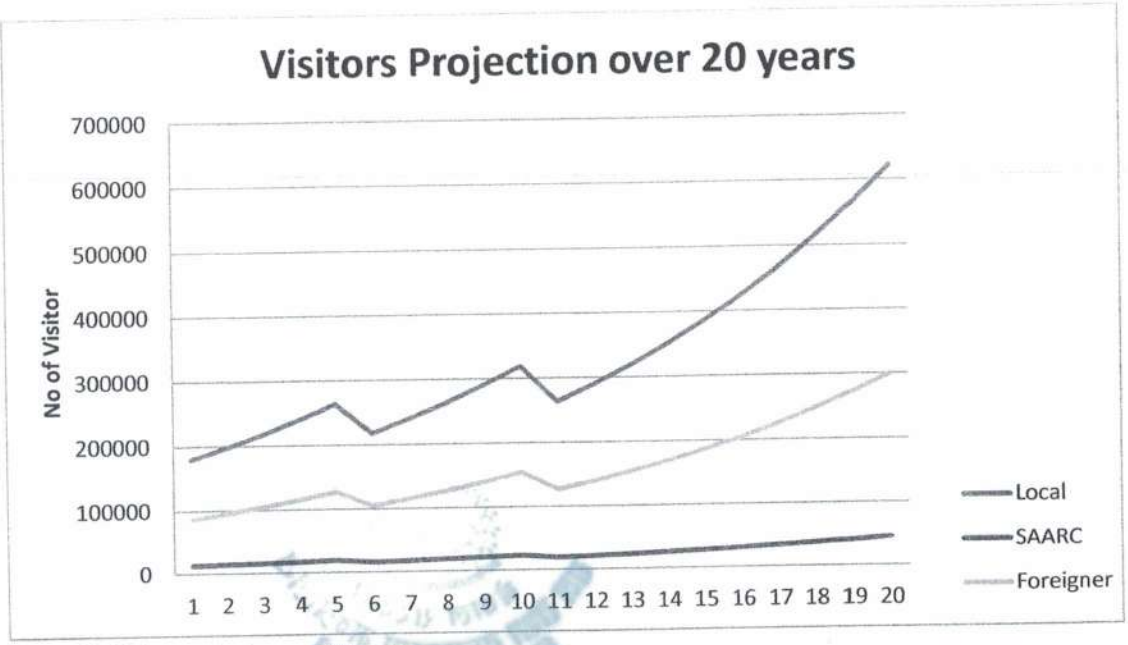


Figure 24: Visitors projection over 20 years

Business Customers

Local as well as national business man will be highly priorities for conducting the business inside the area by facilitating the leasing concept in different items. The leaseholders will be contracted for certain year with relevant amounts.

Universities and Research Wings

Various Secondary and Primary sources of data have been explored/surveyed in order to understand the need, taste, behavior and economics of these potential customer segments, on the basis of which, following description about the target market and service offerings has been incorporated in the business model of Bhanubhakta ZG.

8.2. Tourism Considerations

The main tourism product will be the Bhanubhakta ZG and natural forests of nearby places. Furthermore, the following areas could be developed as particular ethnic group-based cultural villages, including home-stay facilities in some selected households with entirely "organic foods".

- Chepang Gaun: Chepang Community
- Machan Gaun : Brahman/Chhetri community
- Chhirkan Gaun: Newar Community

These cultural villages could also be linked with the hotels and guest houses at mentioned villages. Some of the settlements/ households can be developed as Live Handicraft Villages (metal, pottery, wood-carving, etc.)

Key features of the area

- Foreign Tourists visiting Pokhara is more than 10 lakhs
- Potential Hotspot Tourist Sites
- Natural Sites
- Tare vir (view points)
- Ghansikuwa
- Ramgha Gaun (Birth Place of Poet Bhanubhakta)

8.3. Community Rights

Community Rights include environmental rights, legal rights, social rights etc. that includes the responsibility as well as utilization. Different activities that communities are doing inside will be excluded with understanding but the rights towards the communities will always secure. The major right that could be addressed is foot trails and water sources inside the proposed ZG that local people are using and water for irrigation and drinking which should be guarantee. Besides these, employment opportunities to local communities will be highly prioritize. And their responsibility and support for the activities carried out for the management of ZG will be appreciated.

8.4. Financial Plan

8.4.1. Zoological Garden Business Model

Over the long run, one of the most significant sources of revenue will be the park itself. With a proper business plan, the park can collect revenues in a number of ways through various activities.

8.4.2. Ticket Sales

The major source of revenue from the park will be the direct ticket sales for entering the park. The model has been so planned that specific costs will be charged for people of specific categories for the entrance into the park. The ticket will provide them privileges to surf the zoological park and get access to any part of the park.

Entrance ticket: This will be the ticket to allow free roaming to any section of the park. This ticket will be of few varieties, depending on the duration of stay. For a single day visit, there will be a one-day ticket that the visitor can use for a single day of entrance. Increasing the days for staying either inside or outside the park, a separate multi-day pass shall be issued costing twice of the single day pass, but validity will be of 3 days.

Recreational ticket: Apart from roaming and visiting the animals and conservation areas, there are few recreational activities that require separate ticket. In the exhibit/display zone, visitors can get separate passes for watching animals and other recreational activities.

Meditation pass: Access to the peace zone will require a separate kind of ticket based on the number of days of stay. The ticket would provide the visitors with access to the peace zone and its facilities including the lodging and food. Its price will be determined by the nature and duration of the stay.

8.4.3. Lease of Structures and Land

Another major source of revenue will be the lease money obtained from various business owners leasing the structures and lands inside the park to conduct their business. Souvenir shops, jeep safari, children Park etc. There will be a number of restaurants, hotels and entertainment services like the fun park that business owners will be given on lease. Either land or structures will be given as per the requirements for specific monthly rentals. This type of revenue will gradually grow into a large source of income in the later years of running of the park.

8.4.4. Video Shooting

Another source of income of the ZG is video shooting. Short and long documentary, Tele serial, films and visual songs can be shooting within this ZG. So administration can charge for each type of shooting.

8.4.5. Government Support

- Federal, Province and Local

The Government of Nepal will be the upper hand in providing budget support to the project when it comes to the administrative costs including the salary for the personnel working for the park. The government will provide budgetary support for the development expenditures which are aimed at implementing the activities and plans laid out in the proposal. Similarly province and local government also takes interest for the development of ZG. Right now all the level of Government has been providing human wildlife conflict mitigation programs for PAs, DFOs and other institutions. So, such support will be the major funding sources for smooth running of the ZG.

8.4.6. Conservation Support

Apart from all the aforementioned sources, another significant financing will be done through two major kinds of external assistances viz. grants from various bi- or multi-lateral organizations and through the donations from various non-government or community based organizations.

The detailed study of the financial aspect of this project in the future will be able to reveal the exact amount of revenues and provide projections for the years to come. This financial study, however, sets a foundation for the revenue streams and the business models to be implemented in the park to make the park sustainable.

Table 18: Tentative 20 years of income of ZG

S. N	Particulars	First Phase (Rs) (1-5 yrs)	Second Phase (Rs) (6-10 yrs)	Third Phase (Rs) (11-20 yrs)	Grand Total
1	Entrance	622157139	875197339	3311942984	4809297461
2	Parking	9704691	19378617	76220058	105303366
3	Recreational Activities	55578524	41608390	52349777	149536691
4	Government (Federal)	218973690	190204004	757030443	1166208136
5	Government (Province and local)	131384214	114122402	454218266	699724882
6	Conservation Partners	87589476	76081601	302812177	466483254
	Total	**1,12,53,87,733**	**1,31,65,92,354**	**4,95,45,73,704**	**7,39,65,53,790**

(Note: Number is increased by 10 % generally (As per visitor data) but rate is relevant to other ZG)

*Local –Assuming 10% from Manakamana Temple and rest from different places

*Foreigner- Assuming 20% visitor from Chitwan and 40% from Annapurna CA

*SAARC-13% of total foreigners

*All the costs are discounted at 8%

The Total Expenditure of BZG are:

Table 19: Tentative 20 years of expenditure of ZG

S. N	Particulars	First Phase (1-5 yrs)	Second Phase (6-10 yrs)	Third Phase (11-20 yrs)	Phase (1+2+3)
1	**Infrastructure Development Cost**	**3176222231**			**3176222231**
2	**Acquisition and Collection of Species**	**74074074**			**74074074**
3	**Management and Operation Cost (a to f)**	**232963229**	**244058943**	**560723143**	**1037745315**
a	Administration	136506849	142237577	326789505	605533931
b	Wildlife Foods and Forages Management	74655454	77789583	178720840	331165877
c	Environment and Crisis Management	6064520	6319114	14518106	26901740
d	Communication, Extension and Promotion	5053766	5265929	12098422	22418117
e	Procurement of Equipment, Tools and Logistic	5053766	5265929	12098422	22418117
f	Engineering and Maintenance	5628873	7180812	16497848	29307533
4	**Capacity Development and Income Generation**	**7580649**	**7898893**	**18147633**	**33627175**
	Total	**3,49,08,40,183**	**25,19,57,836**	**57,88,70,775**	**4,32,16,68,794**

Note: The details of above mentioned income and expenditure is given in Annex 7

8.5. Cost Benefit Analysis

There are various benefits of the project that needs to be elaborated in economic aspects of the project. Here financial benefit cost analysis has been done to compare direct project cost and direct project revenue. Based on the discussed project number of visitors, the proportion of various categories expected ticket rate, the ticket revenue has been calculated. Similarly, based on the project implementation strategy discussed above and project cost at various phase, the direct expenditure has been estimated each year.

Based on the direct expenditure and income, the cumulative income and cost have been calculated to estimate benefit to cost benefit ratio presented in the table above. For preliminary calculate time value of money is considered. The analysis shows that the return of investment will occur approximately 12 years after the operation. Figure shows that cost revenue and B/C show that expenditure is high in initial year of the project while the income is higher in the last year.

Table 20: Net profit and loss

Particulars	**Over 20 years**			
	First Phase	**Second Phase**	**Third Phase**	**Total**
Total Income	1125387733	1316592354	4954573704	7396553790
Total Expenditure	3490840183	251957836	578870775	4321668794
Net Profit/Loss	-2365452450	1064634518	4375702928	3074884996
Benefit Cost Ration (Rate of Return)				1.71
Break Even Point (BEP)				12 years

CHAPTER 9: IMPLEMENTATION PLAN

The implementation schedule for development of the Bhanubhakta ZG is summarized in Table 18. As indicated in the schedule, the total development period of the project is estimated to be 20 years. This period includes pre-construction activities such as detailed engineer and study, Fencing and Boundary demarcation land acquisition. The actual construction works, including the construction of Admin Building and related structures, development of the ZG infrastructures, construction of wild animal enclosures and recreational structures is expected to be completed within this 20 year period.

9.1. Phase-wise Development Plan

Each item of infrastructures and animals are carefully evaluated for their importance in a different phase of construction. Accordingly, their proportion to be developed or implemented in each phase is assigned.

- Short Term Plan (1-5 Years)
- Mid Term Plan (6-10 Years)
- Long Term Plan (11-20 Years)

9.1.1. Short Term Plan

This phase (Short term phase) begins from the date of the approval of the master plan to next five years. Immediately after the approval of the master plan, the detail engineering of the ZG will begin. Private land acquisition process will be completed within this period. In the meantime, boundary demarcation and boundary fencing will begin. Primary admin building construction will be constructed within the zoological ZG for smooth operation and management of the works.

Basic infrastructures like, road construction, water supply management and infrastructures to facilitate electricity will be constructed in priority orders. Likewise, wild animal enclosure, enclosures for birds and reptiles, viewing decks will be constructed in between this period. A nursery and botanical ZG and other ZGs will be developed within this phase.

9.1.2. Mid Term Plan

The planning made for 6^{th} to 10^{th} year is called midterm plan for the further development of zoological ZG and collection of exotic wildlife.

9.1.3. Long Term Plan

Remaining recreational infrastructures construction works will be planned and constructed in this phase. A standard Resort has also been planned to be constructed in the same phase. The summary of the overall estimated cost in a different phase of various categories of infrastructures and animals in different phases are tabulated below:

Table 21: Implementation of phase wise development

S.N	Description	Total Cost		
		Short Term (%)	Mid Term (%)	Long Term (%)
1	**Preparatory works**	**100.00**		
2	**Land Acquisition**	**100.00**		
3	**Property Fencing**	**100.00**		
4	**Infrastructure Development**	**71.11**	**20.00**	**8.89**
4.1	Access Road Development	100.00		
4.2	Water Supply	60.00	40.00	
4.3	Ropeway			100.0
4.4	Temple	60.00	40.00	
4.5	Statue	100.00		
4.6	View Tower	100.00		
4.7	Helipad	20.00	80.00	
4.8	Power arrangement	100.00		
4.9	Telephone line connection	100.00		
5	**Development activities in community**	**30.00**	**30.00**	**40.00**
6	**Administration Area**	**96.00**	**4.00**	
6.1	Bhanubhakta Zoological Office Building	100.00		
6.2	Educational Block	100.00		
6.3	Parking near office building(P1)	100.00		
6.4	Guard House	100.00		
6.5	Staff Quarter Parking (P2)	100.00		
6.6	Helipad	100.00		
6.7	Staff Quarter	100.00		
6.8	Main Parking(P3)	100.00		
6.9	Clinic	100.00		
6.10	Information Centre	100.00		
6.11	Multipurpose Hall	100.00		
6.12	Public Toilet	100.00		
6.13	Boundary Entrance	100.00		
6.14	Main Entrance	100.00		
6.15	Child Friendly Tap	100.00		
6.16	Restaurant/Café	100.00		
6.17	Ticket Counter	100.00		
6.18	Statue	100.00		
6.19	Children Park	100.00		

6.20	Public park	100.00		
7	**Exhibit/Display Area**	**82.22**	**15.56**	**2.22**
7.1	Animal Kitchen	100.00		
7.2	Central Kitchen	100.00	50.00	
7.3	Pond	40.00	40.00	20.00
7.4	Rock Garden	100.00		
7.5	Restaurant/Café	40.00	60.00	
7.6	Guard house	60.00	40.00	
7.7	View Tower	100.00		
7.8	Public Toilet	100.00		
7.9	Temple	100.00		
8	**Rescue and Animal Hospital Area**	**64.44**	**31.12**	**4.44**
8.1	Rescue Centre	60.00	40.00	
8.2	Pond	40.00	40.00	20.00
8.3	Animal Hospital	60.00	40.00	
8.4	Restaurant/Café	60.00	40.00	
8.5	Research Centre	60.00	40.00	
8.6	Public Toilet	60.00	40.00	
8.7	Child Friendly Tap	100.00		
8.8	Guard House	100.00		
8.9	Enclosure	40.00	40.00	20.00
9	**Peace and Mediation Area**	**70.00**	**21.42**	**8.57**
9.1	Pond	40.00	40.00	20.00
9.2	Meditation Centre	40.00	40.00	20.00
9.3	Meditation yard	70.00	30.00	
9.4	Guard House	100.00		
9.5	Public Toilet	100.00		
9.6	Child Friendly Tap	100.00		
9.7	Restaurant/Café	40.00	40.00	20.00

CHAPTER 10: MONITORING AND EVALUATION

10.1. Coordination and Collaboration

When a team of people work together towards achieving a common goal, effective collaboration and coordination could be a main factor that contributes to the success of their efforts. The team comprises of federal, province, local government, local community and other stakeholders. This team may have different wings and play different role that gives the good results in overall management of ZG. Local Government including Division Forest Office, Municipality, Security agency paly in policy level with allocating some amount for the management. Similarly, other stakeholders like chamber of commerce, different association, federation, and alliance may promote and built network, same as community based organization like CFUGs, Club, Women group voluntarily support for the overall coordination between ZG and community.

Besides these donors like WWF, ZSL, IUCN, NTNC and other conservation partners generates the fund for the ZG. The private sector involvement can invest for the betterment of the ZG in certain fields.

Development of coordination committee for the management of the ZG will be the best monitoring and evaluation practices. So coordination committee and mechanism will be formed including various stakeholders, government agencies and local communities.

10.2. Monitoring

Monitoring is the systematic process of collecting, analysing and using information to track a programme's progress toward reaching its objectives and to guide management decisions. Monitoring usually focuses on processes, such as when and where activities occur, who delivers them and how many people or entities they reach. Monitoring is conducted after a programme has begun and continues throughout the programme implementation period. It is routinely carried out by project staff, project partners and peer educators as they keep track of their work. It keeps track of project inputs and outputs such as:

- Activities;
- Reporting and documentation;
- Finances and budgets;
- Supplies and equipment.

10.3. Evaluation

An evaluation is a systematic and objective examination concerning the relevance, effectiveness, efficiency and impact of activities in the light of specified objectives. The idea in evaluating projects is to isolate errors not to repeat them and to underline and promote the successful mechanisms for current and future projects.

An evaluation asks whether a project is achieving what it set out to do, and whether it is making a difference. If this is happening the evaluation seeks to understand how and why the intervention has worked so well. If the project is unsuccessful, questions are raised as to what could have been done better or differently. Evaluations can be performed by external

agencies or by project staff, peer workers and stakeholders, or by a combination of the latter three groups and external agencies. External involvement lends technical expertise and objectivity to evaluations

The monitoring and evaluation plan for the development of ZG will serve two functions: first, periodic assessment of project implementation and performance of activities and second, evaluation of their results in terms of relevance, effectiveness and impacts. Each short term, mid-term and long term activities will be monitored and evaluated by the team of experts within the administration committee of the Bhanubhakta ZG.

After operation, it will be evaluated regularly by Federal Government through Ministry of Forests and Environment or other Authority in coordination with Province.

CHAPTER 11: CONCLUSION AND RECOMMENDATION

11.1. Conclusion

The study has found that the project is technically possible and financially viable project for development for Zoological Garden. It has a tremendous potential to allow surrounding cities to tackle many environmental problems, managing problem wildlife to minimize human wildlife conflict and help them become more sustainable. The ZG do justice to natural as well as cultural ecological settings of the area. Plan is prepared in such a way that it has a minimum intervention to the natural environment. The area and its surrounding are developed in such a way so that no any environmental and ecological will be disturb. Moreover, as per the name Bhanubhakta Acharya, the plan tried to maintain his ideology with peace. In addition, following conclusions are drawn from the present study.

- Four separate areas will be developed in which various sections will be separated so that the conflict among the wildlife species will be minimized.
- In the first year infrastructures development in Administration area will be prioritized and it will be followed for the arrangement of wildlife including enclosures in exhibit/display area.
- Similarly, the remaining infrastructure will be prepared with the collaboration of stakeholders in the same time.

11.2. Recommendation

This study is general master planning of the ZG. A detail project engineering and geological/geophysical investigation of some major sites within the ZG is recommended.

While preparing the Detail Project Report (DPR), geophysical investigation will be highly concerned. Similarly, the path within conservation area for the public will be guaranteed and water supply for drinking and irrigation will also be assured. The conflict between human and wildlife in such area is very risky and the project should take high interest to mitigate such matter. Livelihood or income generating activities for the local people is very important. So the project may plan such activities to local people that may enhance their life. The waste management for the environmental aspect is very crucial part which should be managed properly inside the ZG. Considering the complexity of the project with significant amount of structural works study recommends using experienced builders and planners. It is also recommended to keep the herbivores and carnivores little bit far with good enclosures.

The coordination committee will be highly recommended for the supervision, monitoring and overall effective management of ZG. After completing land acquisition and DPR approval, management modality of the ZG will be finalized by the Government. There are four options for future management; first manage by Federal Government, second managed by Gandaki Provinces and third manage by NGO or other organizations including local government, four manage by collaboration among different agencies. The establishment and management of ZG must not be evaluated only based on cost benefit analysis. This has more social, environment and moral value which are generally excluded in present context.

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ANNEXES

Annex 1: List of Flora and Fauna

S.N	Nepali Name	Scientific Name	Family
1	साल	*Shorea robusta*	Dipterocarpaceae
2	असना	*Terminelia tomentosa*	Combretaceae
3	उत्तिस	*Alus nepalensis*	Betulaceae
4	टाँकी	*Bauhinia purpurea*	Leguminosae
5	कोइरालो	*Bauhinia variegate*	Leguminosae
6	सिमल	*Bombax ceiba*	Bombacaceae
7	गायो	*Bridelia retusa*	Euphorbiaceae
8	ढाल्ने कटुस	*Castanopsis indica*	Fagaceae
9	मुसुरे कटुस	*Castanopsis tribuloides*	Fagaceae
10	खरी	*Celtis australis*	Ulmaceae
11	लाम्पाते	*Duabanga grandiflora*	Sonneratiaceae
12	पहाडी मौवा	*Engelhardtia spicata*	Juglandaceae
13	फलेदो	*Erythrina stricta*	Leguminosae
14	वर	*Ficus bengalensis*	Moraceae
15	वोटधाइरो	*Lagerstroemia parviflora*	Lythraceae
16	खोटेसल्ला	*Pinus roxburghii*	Pinaceae
17	पैयु	*Prunus cerasoides*	Rosaceae
18	लालीगुराँस	*Rhododendron arboreum*	Ericaceae
19	चिलाउने	*Schima wallichii*	Theaceae
20	भलायो	*Semicarpus anacardium*	Anacardiaceae
21	जामुन	*Syszygium cumini*	Myricaceae
22	क्यामुन	*Syszygium operculata*	Myricaceae
23	बाँझ	*Quercus spp.*	Fagaceae
24	सांदन/पानन	*Ogeinia Oojeinensis*	Leguminosae
25	कुसुम	*Schleichera oleosa*	Sapindaceae
26	सिरिस	*Albizia spp.*	Leguminosae
27	सतिसाल	*Dalbergia latifolia*	Leguminosae
28	दवदवे	*Garuga pinnata*	Burseraceae
29	खमारी	*Gmelina arborea*	Verbenaceae
30	आँप	*Mangifera indica*	Anacardiaceae
31	बाझी	*Anogeisus latifolia*	Combretaceae
32	भिँगन	*Lannea grandis*	Anacardiaceae
33	तिजु/खल्लुक	*Diospyros embryopteris*	Ebenaceae
34	भिमसेनपाते	*Buddleja asiatica*	Buddlejaceae
35	दारगिठी	*Boehmeria rugulosa*	Urticaceae
36	चाँप	*Michelia champaca*	Magnoliaceae

37	कुटमिरो	*Litsea monopetala*	Lauraceae
38	खिरौं	*Sapium insigne*	Euphorbiaceae
39	पलास	*Butea monosperma*	Leguminosae
40	फल्दु	*Mitragyana parviflora*	Rubiaceae

List of Mammals

S. No.	Nepali Name	English Name	Scientific Name
1	चितुवा	Common Leopard	*Panthera pardus*
2	वन विरालो	Jungle Cat	*Felis chaus*
3	स्याल	Golden Jackal	*Canis aureus*
4	फ्याउरो	Bengal Grey Fox	*Vulpes bengalensis*
5	मलसाप्रो	Yellow Throated Marten	*Martes flavigulia*
6	खैरो लोखर्के	Irrawaddy Squirrel	*Callosciurus pygerythrus*
7	दुम्सी	Indian Crested Porcupine	*Hystrix indica*
8	न्याउरीमुसो	Indian Grey Mongoose	*Herpestes edwardsi*
9	रतुवा मृग	Barking Deer	*Muntiacus vaginalis*
10	चमेरो	Fruit Bat	*Rousettus spp*
11	खरायो	Indian Hare	*Lepus nigricollis*
12	रातो बाँदर	Rhesus Macaque	*Macaca mulatta*
13	लंगुर बाँदर	Tarai Grey Langur	*Seminopithecus hector*
14	चमेरो (ठूलो)	Indian Flying Fox	*Pteropus giganteus*

List of Birds

S. No.	Nepali Name	English Name	Scientific Name
1	कालो तित्रा	Black Francolin	*Francolinus francolinus*
2	कालिज	Kalij Pheasant	*Lophura leucomelana*
3	वन कुखुरा	Red Jungle Fowl	*Gallus gallus*
4	न्याउली	Great Barbet	*Megalaima virens*
5	कुथुर्के	Blue Throated Barbet	*Magalaima asiatica*
6	ढुकुर	Dove	*Streptopelia spp*
7	कालो चिल	Black Kite	*Milvus Migrans*
8	सेतो गिद्ध	Egyptian Vulture	*Neophron Percnopterus*
9	डगर गिद्ध	White-rumped Vulture	*Gyps bengalensis*
10	सानो खैरो गिद्ध	Slender-billed Vulture	*Gyps tenuirostris*
11	वाज	Eurasian Hobby	*Falco subbuteo*
12	लामपुछ्रे	Red-billed blue magpie	*Urocissa erthrorhyncha*
13	कोकले	Grey Treepie	*Dendrocitta formosae*
14	काग	House Crow	*Carvus splenders*

15	डाडेग्रे	Common Myna	*Acridotheres tristis*
16	जुरेली	Red-vented Bulbul	*Pycnonotus cafer*
17	तोरीगाडा	White Crested Laughing thrush	*Garrulax leucolophus*
18	घर भगेरो	House Sparrow	*Passer domesticus*
19	चिवे	Black Drongo	*Dicrurus macrocercus*
20	रानीचरी	Scarlet Minivet	*Pricrocotus flammeus*
21	ठेउवा	Indian Roller	*Coracias bengalensis*
22	कोइली	Indian Cuckoo	*Cuculus micropterus*
23	लाटो कोसेरो	Barn Owl	*Tyto alba*
24	काकाकुल	Crested Serpent Eagle	*Spilornis cheela*
25	हलेसो	Yellow Footed Green Pigeon	*Treron phoenicoptera*

List of Reptiles and Amphibians

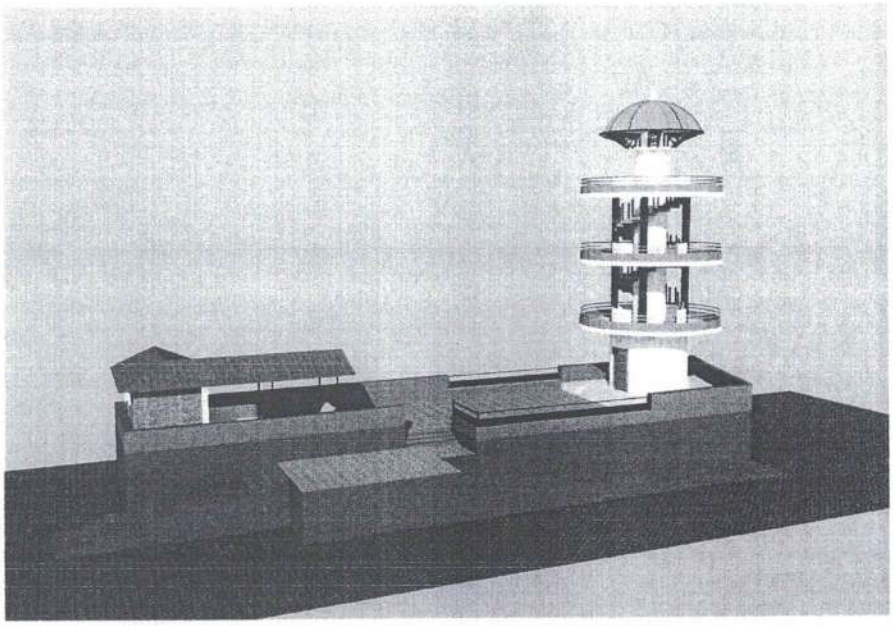
S. N	Nepali Name	English Name	Scientific Name
1	साधारण सर्प	Common cat Snake	*Bioga trigonata*
2	धामन सर्प	Rat Snake	*Ptyas mucosus*
3	गोहोरो	Common Indian Monitor	*Varanus bengalensis*
4	सुन गोहोरो	Golden Monitor	*Varanus flavescens*
5	माउसुली	Wall Lizard	*Hamidactylus spp.*
6	भ्यागुता	Frog	*Frog spp.*
7	अजिङ्गर	Burmese Rock Python	*Python bivittatus*

List of butterflies and insects

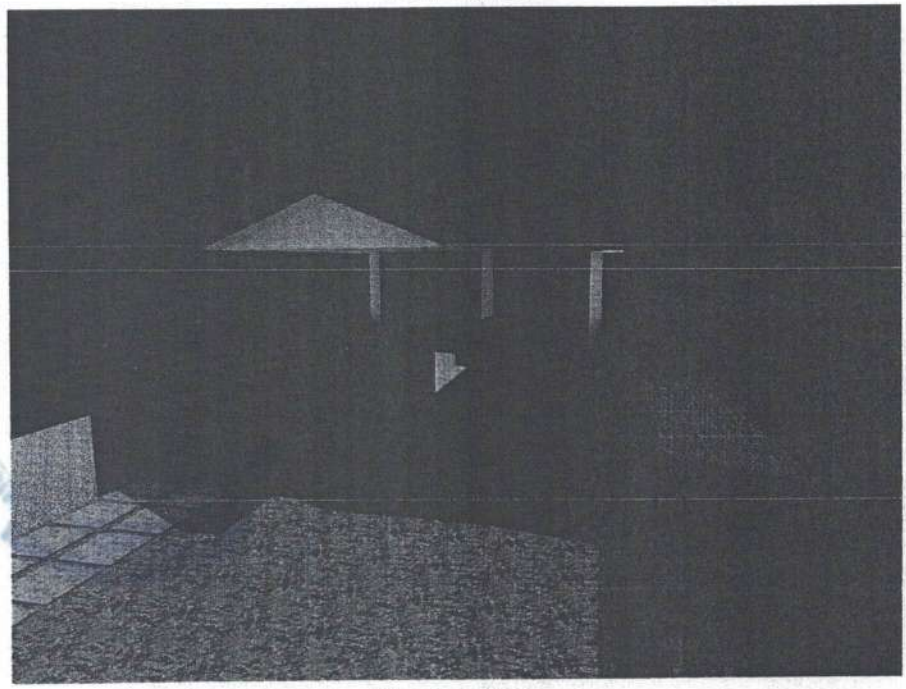
S. N.	Nepali Name	English Name	Scientific Name
1	कागती पुतली	Lima Swallow Tail Butterfly	*Papilio demoleus*
2	गौथली पुच्छे पुतली	Shallow–Tail Butterfly	*Papilio polyctor*
3	सेतो पुतली	Cabbage Butterfly	*Pieris brassica*
4	कैलो पुतली	Common Evening Brown Butterfly	*Melanitis leda*
5	बाघे पुतली	Tiger Butterfly	*Salartira spp*
6	फट्याङग्रा	Grasshopper	*Catantops spp*
7	भमरा	Bumble Bee	*Xylocope spp*
8	भिर माहुरी	Rock Bee	*Apis dorsata*

Source: Tanahu District Forest Operation Plan 2073 BS

Annex 2: Design of the different structures



View Tower

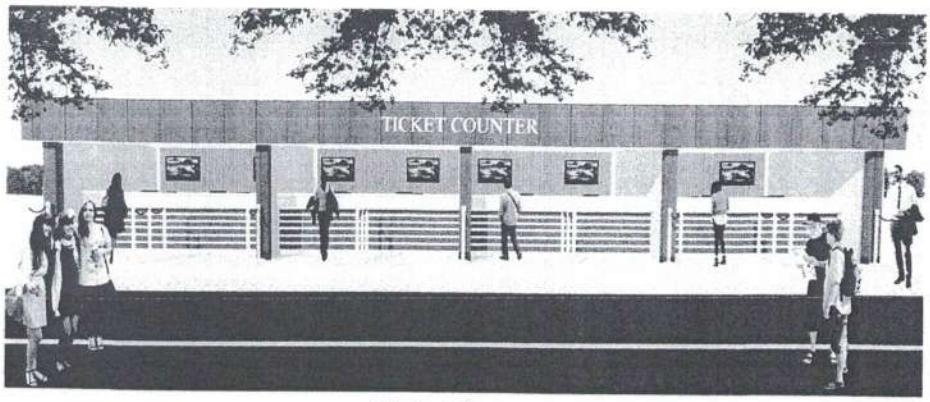


Service block

Office Building

Multipurpose Building

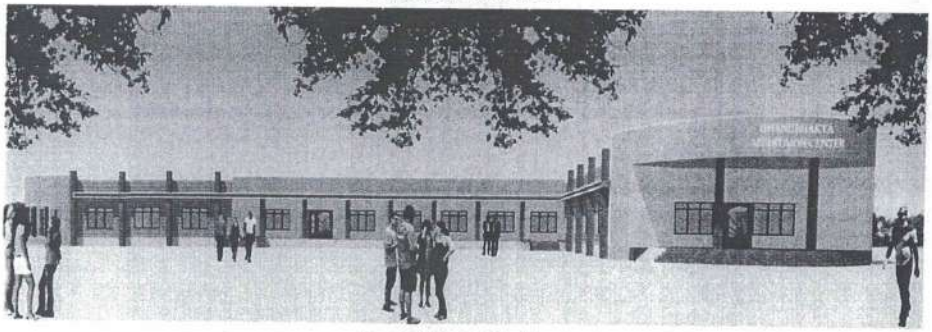
Guard House



Ticket Counter

Café

Central Kitchen



Resort meditation

Annex 3: Coordinates of Major Structures

S.N.	Description	X	Y
1	Admin/Office Building	239462.34	3098813.305
2	Staff Quarters	239437.265	3099073.655
3	Aviary Exhibit	239265.489	3099050.372
4	Botanical ZG	239174.472	3098925.488
5	Carnivorous Exhibit	240102.368	3099592.504
6	Herbivorous Exhibit	239353.331	3099219.189
7	Pond	238757.885	3099231.744
8	Cafeteria	239050.625	3099220.102
9	Meditation Zone	237833.429	3099425.287
10	Hospital	239255.964	3099105.405
11	Rescue Center	239331.106	3099140.330
12	Rock ZG	239284.539	3099391.156
13	Aquatic Exhibit	239141.664	3099330.831
14	Reptile Exhibit	239266.548	3099539.323
15	View Tower	241061.881	3100601.288
16	Temple (Siddha Mandir)	239463.850	3098813.305
17	Chepang Gaun Homestay	239216.497	3099676.796
18	Machan Gaun Homestay	240482.266	3099822.486

Annex 4: Staff recruitments and their description

[illegible] कर्मचारी विवरण

[illegible]

[illegible]				[illegible]		[illegible]			[illegible]
सि.नं.	पद नाम	श्रेणी	सेवा समूह, उपसमूह	संख्या	[illegible]	[illegible]	[illegible]	[illegible]	
१	[illegible]	[illegible]	नेपाल [illegible]	१	१	१	०	१	स्थायी
२	सिभिल इन्जिनियर	[illegible] तृतीय श्रेणी	नेपाल इन्जिनियरिङ [illegible]	१	१	१	०	१	स्थायी
३	सहायक [illegible]	[illegible]	नेपाल वन [illegible]	२	१	२	०	२	स्थायी
४	पशु चिकित्सक	[illegible]	नेपाल कृषि, [illegible]	१	१	१	०	१	स्थायी
५	लेखापाल	[illegible]	नेपाल प्रशासन, लेखा	१	०	१	०	१	स्थायी
६	नायब सुब्बा	[illegible]	नेपाल प्रशासन, सामान्य प्रशासन	[illegible]	१	१	०	१	स्थायी
७	[illegible]	[illegible]	नेपाल वन [illegible]	३	०	३	०	३	स्थायी
८	पशु स्वास्थ्य प्राविधिक	[illegible]	नेपाल कृषि, [illegible]	१	१	[illegible]	०	१	स्थायी
९	सब-इन्जिनियर	[illegible]	नेपाल इन्जिनियरिङ [illegible]	१	[illegible]	१	०	१	स्थायी
१०	कम्प्युटर अपरेटर	[illegible]	नेपाल विविध	१	१	१	०	१	करार
११	खरिदार	[illegible]	नेपाल प्रशासन, सामान्य प्रशासन	१	१	१	०	१	स्थायी
१२	[illegible]	श्रेणी विहीन		२	०	२	०	२	करार
१३	कार्यालय सहयोगी	श्रेणी विहीन		२	०	२	०	२	करार
१४	गेमस्काउट	श्रेणी विहीन	नेपाल वन [illegible]	१०	१०	१०	०	१०	स्थायी
				२८	११	२८		२८	

कर्मचारी विवरण तयार गर्ने :

नाम थर :

पद :

दस्तखत :

मिति :

कर्मचारी विवरण प्रमाणित गर्ने :

नाम थर :

पद :

दस्तखत :

मिति :

०६४-०४-०६

कार्यालय प्रमुख

Annex 5: Section wise enclosures in BZG

S.N	Species	Habit	Habitat
A.	**Herbivore Section**		
1	Hare (Indian, Hispid) -2	H	T
2	Bats (Flying fox, Intermediate Horseshoe, Roundleaf, Pipistrelle, Noctule) – 5	H	Ar
3	Musk deer (Alpine and Himalayan) -2	H	T
4	Barking deer	H	T
5	Swamp deer	H	T
6	Sambar deer	H	T
7	Chital	H	T
8	Hog deer	H	T
9	Blue bull/ Nilgai	H	T
10	Four-horned antelope	H	T
11	Black buck	H	T
12	Blue sheep	H	T
13	Himalayan thar	H	T
14	Goral	H	T
15	Himalayan serow (Thaar)	H	T
16	Gaur (Mega)	H	T
	Total		
B.	**Mega Herbivore Zone**		
17	Water buffalo/ Arna	H	T/A
18	Kiang/ Wild ass	H	T
19	Rhinoceros	H	T/A
20	Wild elephant	H	T
C	**Carnivore Zone**		
21	Jungle cat	C	T
22	Fishing Cat	C	T/A
23	Asiatic Golden Cat		
24	Leopard cat	C	T
25	Clouded leopard	C	T
26	Snow leopard	C	T
27	Tiger	C	T
28	Leopard	C	T
29	Bengal fox, Red fox, Spotted Linsang - 3	C	T
30	Jackal	C/H/O	T
31	Grey wolf or Wild dog	C	T
32	Striped hyena	C	T
33	Mugger crocodile	C	T/A
34	Gharial crocodile	C	T/A

35	Monitor (Golden, Bengal) -2	C	T/A
36	Poisonous Snakes (Python, Common Cobra, King Cobra, Common Krait, Banded Krait, Russell's Viper) -6	C	A
37	Non Poisonous Snakes-15	C	T/A
C1	**Bear Zone**		
38	Himalayan black bear	C/H/O	T
39	Sloth bear	C/H/O	T
40	Himalayan Brown bear		
C2	**Harpetofauna Zone**		
41	Surface Dwellings Native species (Fish-20)	C/H	A
42	Carps and Other Commercial Verities (rohu, catla, mrigal, Ashla, mahseer, rainbow trout, grass carps, Chinese, Carps) -8	C/H	A
43	Himalayan newt	C	T/A
44	Toads (Burmese spadefoot, Himalayan, Black-spined)-3	C	T/A
45	Paahaa (Nepal, Tiny, Small paa frog) -3	C	T/A
46	Frogs (Sikkimese caecilian, Giant treefrog, Chunam frog, Indian burrowing frog, Skittering frog, Tiger frog, Indian balloon frog, -7	C	T/A
C3	**Aviifauna Zone (Birds & Butterflies)**		
47	Ducks, Cranes, Cormorants, Storks, Egrets etc-20	C/H/O	T/A
48	Barbet (Blue throtened, Blue eared, Great, Copper Smith) -4		
49	Wood Peaker (Rufuos, Greater Yellow Naped, Grey Headed, Pale Headed) -4		
50	Eagle (Imperial, Steppe, Golden) – 3		
51	Martin (Plain, Sand, Nepal House) -3		
52	Warbler (Golden Spectacled, Grey wooded, Greenish) -3		
53	Babbler (Spiny, Black Chinese, Jungle) -3		
54	Kalij, monal, danfe, chilime, phukras, chukor etc-8	C/H/O	T
55	Vultures (Oriental White Backed, Eurasian Griffon, Long billed, Red Headed) -4	C	T
56	Owlet (Asian Barred, Jungle, Spotted, Eurasian Eagle, Brown Fish) -5	C	T
57	Hornbills (Great, Rhinoceros, Indian Grey) -3	H	T
58	Peacock	H/C	T
59	Talking Birds (Common Mynah, Jungle Mynah, Parrot) -3	H	T/Ar
60	Sarus Crane	C/H	T
61	Beetles (Leaf, Tiger, Long horned, rhinoceros) -4	C/H	T
62	Butterflies-30	H	T
C4	**Small Mammals (Hare, Mongoose & Other Burrowing animal)**		
63	Marmot (Himalayan, Bobak)-2	H	T
64	Porcupine (Indian Crested, Malayan) -2	C/H/O	T
65	Squirrel (Red giant flying, Northern Palm, Irrawaddy, Black Giant, Orange-bellied Himalayan) -5	H	Ar/T
66	Mongoose (Small Indian, Indian grey, Crab-eating) -3	C/H/O	T

67	Otter-1	C	T/A
68	Yellow throated marten, Siberian Weasel -2	C	T
69	Pangolin (Indian and Chinese) -2	C	T
70	Rat (Turkestan, House, Brown, Indian Bush, Eastern House, Fawn coloured, Little Indian Field) -7		
71	Shrew (Asian House, Himalayan water, Elegant Water) -3		
D	**Omnivorous Zone**		
72	Turtle (Indian Eye, Crown river, Three Striped Roofed, Red Crowned Roofed, Black Pond) -5	C/H/O	T/A
73	Marmot (Himalayan, Bobak)-2	C/H/O	T
74	Red panda, Hogbadger, Honey Badger – 3	C/H	T
75	Langurs (Complex, Terai Grey, Nepal Grey)-3	C/H	Ar/T
76	Rhesus monkey	C/H	Ar/T
77	Assamese monkey	C/H	Ar/T
78	Wild boar	C/H	T

Annex 6: **Recommended Wildlife Species for display and their gross area (First Lot):**

S.N	Species	Proposed No.	Habit	Habitat	*Gross Area (Sq.m)	Remarks
Insects						
1	Beetles (Leaf, Tiger, Long horned, rhinoceros)	4	C/H	T	300	
2	Butterflies	20	H	T	300	
					600	
Fish						
1	Surface Dwellings Native species	20	C/H	A	3000	Spot Fishing
2	Carps and Other Commercial Verities (rohu, catla, mrigal, Ashla, mahseer, rainbow trout, grass carps, Chinese, Carps)	8	C/H	A	3000	feeding birds, turtles, crocodiles etc
					6000	
Amphibians						
1	Himalayan newt	1	C	T/A	300	
2	Toads(Burmese spadefoot, Himalayan, Black-spined)-	3	C	T/A	300	
3	Paahaa (Nepal, Tiny, Small paa frog)	3	C	T/A	500	
4	Carps and Other Commercial Verities (rohu, catla, mrigal, Ashla, mahseer, rainbow trout, grass carps, Chinese, Carps)	8	C	T/A	500	
5	Frogs (Sikkimese caecilian, Giant treefrog, Chunam frog, Indian burrowing frog, Skittering frog, Tiger frog, Indian balloon frog	7	C	T/A	500	Supplying to Academic institutions
					2100	
Reptiles						
1	Turtle (Indian Eye, Crown river, Three Striped Roofed, Red Crowned Roofed, Black Pond)	5	C/H/O	T/A	800	
2	Mugger	2	C	T/A	500	
3	Gharial	2	C	T/A	500	
4	Monitor (Golden, Bengal)	2	C	T/A	300	

5	Poisonous Snakes(Python, Common Cobra, King Cobra, Common Krait, Banded Krait, Russell's Viper)	6	C	A	1100	
6	Non Poisonous Snakes	15	C	T/A	500	
					3700	
			Birds			
1	Ducks, Cranes, Cormorants, Storks, Egrets etc.	20	C/H/O	T/A	3000	
2	Kalij, monal, danfe, chilime, phukras, chukor etc	8	C/H/O	T	3000	
3	Babbler (Spiny, Black Chinese, Jungle)	3	C/H/O	T	500	
4	Vultures (Oriental White Backed, Eurasian Griffon, Long billed, Red Headed)	4	C	T	2000	
5	Owlet (Asian Barred, Jungle, Spotted, Eurasian Eagle, Brown Fish)	5	C	T	1000	
6	Hornbills (Great, Rhinoceros, Indian Grey)	3	H	T	500	
7	Eagle (Imperial, Steppe, Golden)	3	C	T	500	
8	Warbler (Golden Spectacled, Grey wooded, Greenish)	3	C/H	T/A	100	
9	Peacock	2	H/C	T	500	
10	Talking Birds (Common Mynah, Jungle Mynah, Parrot)	3	H	T/Ar	300	
11	Sarus Crane	2	C/H	T	500	
12	Barbet (Blue throtened, Blue eared, Great, Copper Smith)	4	C/H	T/A	100	
13	Wood Peaker (Rufuos, Greater Yellow Naped, Grey Headed, Pale Headed)	4	C/H	T/A	100	
					12100	
			Mammals			
1	Hare (Indian, Hispid)	2	H	T	600	
2	Marmot (Himalayan, Bobak)-	2	H	T	600	
3	Squirrel (Red giant flying, Northern Palm, Irrawaddy, Black Giant, Orange-bellied Himalayan)	5	H	Ar/T	300	

4	Porcupine (Indian Crested, Malayan)	2	C/H/O	T	1000	
5	Pangolin (Indian and Chinese)	2	C	T	1000	
6	Rat (Turkestan, House, Brown, Indian Bush, Eastern House, Fawn coloured, Little Indian Field)	7			300	
7	Shrew (Asian House, Himalayan water, Elegant Water)	3			300	
8	Common/ Asian palm civet		C/H/O	T	300	
9	Jungle cat	2	C	T	300	
10	Fishing Cat	2	C	T/A	500	Must be provided a small pond
11	Leopard cat	1	C	T	500	
12	Clouded leopard	1	C	T	1000	
13	Snow leopard	1	C	T	1500	
14	Tiger	2	C	T	8000	
15	Leopard	1	C	T	5000	
16	Mongoose (Small Indian, Indian grey, Crab-eating)	3	C/H/O	T	800	
17	Bengal fox, Red fox, Spotted Linsang	3	C	T	600	
18	Jackal	1	C/H/O	T	500	
19	Grey wolf or Wild dog	1	C	T	3000	both species are difficult to procure
20	Striped hyena	2	C	T	1500	
21	Himalayan black bear	1	C/H/O	T	5000	
22	Sloth bear	1	C/H/O	T	5000	
23	Otter	2	C	T/A	1000	whatever species available, they can be kept in a single enclosure, but it must have a small pond)
24	Yellow throated marten, Siberian Weasel	2	C	T	500	
25	Red panda, Hogbadger, Honey Badger	3	C/H	T	1000	very difficult to raise, enclosure with enough bamboo and other vegetation required
26	Bats (Flying fox, Intermediate Horseshoe,		H	Ar	500	

	Roundleaf, Pipistrelle, Noctule).	5				
27	Langurs (Complex, Terai Grey, Nepal Grey)	3	C/H	Ar/T	1600	all species cannot be kept in a single enclosure
28	Rhesus monkey	2	C/H	Ar/T	1500	
29	Assamese monkey	2	C/H	Ar/T	1600	
30	Wild boar	2	C/H	T	1000	
31	Musk deer (Alpine and Himalayan)	2	H	T	1000	
32	Barking deer	4	H	T	800	
33	Swamp deer	4	H	T	1000	
34	Sambar deer	4	H	T	1500	
35	Chital	4	H	T	1500	
36	Hog deer	2	H	T	1200	
37	Blue bull/ Nilgai	2	H	T	1500	
38	Four-horned antelope	2	H	T	1000	
39	Black buck	2	H	T	1400	
40	Blue sheep	2	H	T	2000	
41	Himalayan thar	2	H	T	2000	
42	Goral	2	H	T	900	
43	Himalayan serow (Thaar)	2	H	T	1000	
44	Gaur	2	H	T	1500	
45	Water buffalo/ Arna	2	H	T/A	2200	
46	Kiang/ Wild ass	2	H	T	1200	
47	Rhinoceros	2	H	T/A	5000	
48	Wild elephant	2	H	T	8000	
					81000	
	Total Gross Area (Sq.m)				**105500**	

Wildlife Recommended for Second Lot

S.N	Species	Habit	Habitat	*Gross Area (Sq.m)	Remarks
			Mammals		
1	Pigmy hog	H	T	300.00	
2	Eurasian lynx	C	T	500.00	
3	Spotted linsang	C	T	300.00	
4	Stone marten	C	T	300.00	
5	Honey badger	C	T	300.00	
6	Pikas	H	T	300.00	
7	Weasel	C	T	500.00	
8	Tibetan Argali	H	T	2000.00	
9	Tibetan Gazelle	H	T	1000.00	
10	Asiatic golden cat	C	T	500.00	
11	Binturong	C	T	300.00	

12	Tibetan fox	C	T	300.00	
13	Giraffe	H	T	1000.00	
14	Zebra	H	T	1000.00	
15	Hippopotamus	C/H	T/A	2000.00	
16	Gorilla	C/H/O	T	500.00	
17	Orangutan	C/H/O	T/Ar	500.00	
18	Chimpanzee	C/H/O	T/Ar	500.00	
Birds					
1	Ostrich	H	T	1000.00	
2	Kiwi	H/C	T	500.00	
3	Penguin	C	T/A	500.00	

Legend: A- Aquatic, Ar- Arboreal, C-Carnivores, H-Herbivorous, O-Omnivorous, T- Terrestrial
** Area allotted to the animals is based on requirements of a medium sized zoological par*

Annex 7: Business Plan (Projected Income)

		1				2				3							4	5	6	7
Phase	Particulars	Intrance Fee	a. Local*	b. SAARC*	c. Foreigner*	Parking	a. Bike	b. Car	c. Bus	Stalls/Lease/ Rent	a. Souvenir Shop (2*50000*12)	b. Cafe and Resturent (4*50000*12)	c. Children Park (50000*12)	d. Conference hall (5*2000*12)	e. Mediation (75000*12)	f. Jeep Safari (1000*2*10*30*12)	Video shooting (5*25000*12)	Government Budget (Federal)	Province and local government	Conservation Partners
	Unit		person	Person	person		no	no	no											
First Phase	1st		180000	13000	87000		20000	5000	5600		1200000	2400000	600000	120000	900000	7200000	1500000	50000000	8000000	2000000
	2nd		198000	14300	95700		22000	5500	6160		1200000	2400000	600000	120000	900000	7200000	1500000	52500000	8400000	2100000
	3rd		217800	15730	105270		24200	6050	6776		1200000	2400000	600000	120000	900000	7200000	1500000	55125000	8820000	2205000
	4th		239580	17303	115797		26620	6655	7454		1200000	2400000	600000	120000	900000	7200000	1500000	57881250	9261000	2315250
	5th		263538	19033	127377		29282	7321	8199		1200000	2400000	600000	120000	900000	7200000	1500000	60775313	9724100	2431013
	Rate		200	500	1000		20	100	200											
	Grand Total Discounte at 8 %	622157139	172954880	31227965	417974294	9704691	1921721	2402151	5380819	55578524	4791252	9582504	2395626	479125	3593439	28747512	5989065	218973690	131384214	87589476
Second Phase	6th		289892	20937	140114		32210	8053	9019		1320000	2640000	660000	132000	990000	7920000	1650000	63814078	38288447	25525631
	7th		318881	23030	154126		35431	8858	9921		1320000	2640000	660000	132000	990000	7920000	1650000	67004782	40202869	26801913
	8th		350769	25333	169538		38974	9744	10913		1320000	2640000	660000	132000	990000	7920000	1650000	70355021	42213013	28142008
	9th		385846	27867	186492		42872	10718	12004		1320000	2640000	660000	132000	990000	7920000	1650000	73872772	44323663	29549109
	10th		424431	30653	205141		47159	11790	13205		1320000	2640000	660000	132000	990000	7920000	1650000	77566411	46539846	31026564
	Rate		300	600	1200		50	200	300											
	Grand Total Discounte at 8 %	875197339	284360146	41074243	549762949	19378617	5265929	5265929	8846760	41608390	3586930	7173860	1793465	358693	2690198	21521581	4483663	190204004	114122402	76081601
	11th		466874	33719	225656		51875	12969	14525		1452000	2904000	726000	145200	1089000	8712000	1815000	199714204.9	119828522.9	79885681.96
	12th		513561	37091	248221		57062	14266	15977		1452000	2904000	726000	145200	1089000	8712000	1815000	209699914.1	125819948.4	83879965.64
	13th		564917	40800	273043		62769	15692	17575		1452000	2904000	726000	145200	1089000	8712000	1815000	220184909.8	132110945.9	88073963.93
	14th		621409	44880	300348		69045	17261	19333		1452000	2904000	726000	145200	1089000	8712000	1815000	231194155.3	138716493.2	92477662.13
	15th		683550	49367	330382		75950	18987	21266		1452000	2904000	726000	145200	1089000	8712000	1815000	242754863.1	145652917.8	97101945.22
	16th		751905	54304	363421		83545	20886	23393		1452000	2904000	726000	145200	1089000	8712000	1815000	254892606.2	152935563.7	101957042.5
	17th		827095	59735	399763		91899	22975	25732		1452000	2904000	726000	145200	1089000	8712000	1815000	267637236.5	160582341.9	107054894.6
	18th		909805	65708	439739		101089	25272	28305		1452000	2904000	726000	145200	1089000	8712000	1815000	281019098.3	168611458.4	112407638.9
	19th		1000785	72279	483713		111198	27800	31136		1452000	2904000	726000	145200	1089000	8712000	1815000	295070053.2	177042031.9	118028021.3
	20th		1100864	79507	532084		122318	30580	34249		1452000	2904000	726000	145200	1089000	8712000	1815000	309823755.8	185893653	123929102
	Rate		500	750	2000		100	300	500											
	Grand Total Discounte at 8 %	3311942984	1088857967	117959613	2105125403	76220058	24196844	18147633	33875581	52349777	4512912	9025824	2256456	451291	3384684	27077471	5641140	757030443	454218266	302812177
Third Phase	Phase (1+2+3) discounted at 8 %	4809297461	1546172994	190261821	3072862647	105303366	31384493	25815713	48103160	149536691	12891094	25782188	6445547	1289109	9668321	77346565	16113868	1166208136	699724882	466483254
Total Projected Income																				7396553790

Projected Expenditure

S.N	1	a	b	c			2	3	a	b	c	d	e	4	
Particulars	Infra structure Development cost	Construction Cost	W/L Enclousure Cost	Water Supply Cost	Total (a+b+c)	DPR Cost (1.5%)	Acquisition and collection of animals	Management and Operation Cost	Coordination, Institutional and Administration Cost	Wild life Food and Forage Management Cost	Environment and Crisis Management cost	Engineering and maintenance cost	Communication, Extension and Promotion	Capacity Development and Income Generation	Total
1st	3430320009	2010693270	1358500000	10432355	3379625625	50694384	80000000	44983164	27010920	14772244	1200000		1000000	1500000	3556803173
2nd								50981480	29712012	16249468	1320000	1500000	1100000	1650000	52631480
3rd								56079628	32683213	17874415	1452000	1650000	1210000	1815000	57894628
4th								61687591	35951535	19661857	1597200	1815000	1331000	1996500	63684091
5th								67856350	39546688	21628042	1756920	1996500	1464100	2196150	70052500
Grand total discounted at 8 %	3176222231	1861753028	1257870370	9659587.96	3129282986	46939245	74074074	232963229	136506849	74655454	6064520	5628873	5053766	7580649	3490840183
6th								74641985	43501357	23790847	1932612	2196150	1610510	2415765	77057750
7th								82106184	47851492	26169931	2125873	2415765	1771561	2657342	84763525
8th								90316802	52636642	28786924	2338461	2657342	1948717	2923076	93239878
9th								99348483	57900306	31665617	2572307	2923076	2143589	3215383	102563866
10th								109283331	63690336	34832179	2829537	3215383	2357948	3536922	112820252
								0							0
Grand total discounted at 8 %								244058943	142237577	77789583	6319114	7180812	5265929	7898893	251957836
11th								120211664	70059370	38315396	3112491	3536922	2593742	3890614	124102278
12th								132232830	77065307	42146936	3423740	3890614	2853117	4279675	136512505
13th								145456113	84771838	46361630	3766114	4279675	3138428	4707643	150163756
14th								160001725	93249022	50997793	4142725	4707643	3452271	5178407	165180132
15th								176001897	102573924	56097572	4556998	5178407	3797498	5696248	181698145
16th								193602087	112831316	61707329	5012698	5696248	4177248	6265872	199867959
17th								212962296	124114448	67878062	5513968	6265872	4594973	6892459	219854755
18th								234258525	136525893	74665868	6065364	6892459	5054470	7581705	241840231
19th								257684378	150178482	82132455	6671901	7581705	5559917	8339876	266024254
20th								283452816	165196330	90345701	7339091	8339876	6115909	9173864	292626679
															0
Grand total discounted at 8 %								560723143	326789505	178720840	14518106	16497848	12098422	18147633	578870775
Phase (1+2+3) discounted at 8 %	3176222231	1861753028	1257870370	9659588	3129282986	46939245	74074074	1037745315	605533931	331165877	26901740	29307533	22418117	33627175	4321668794

Calculation of Break Even

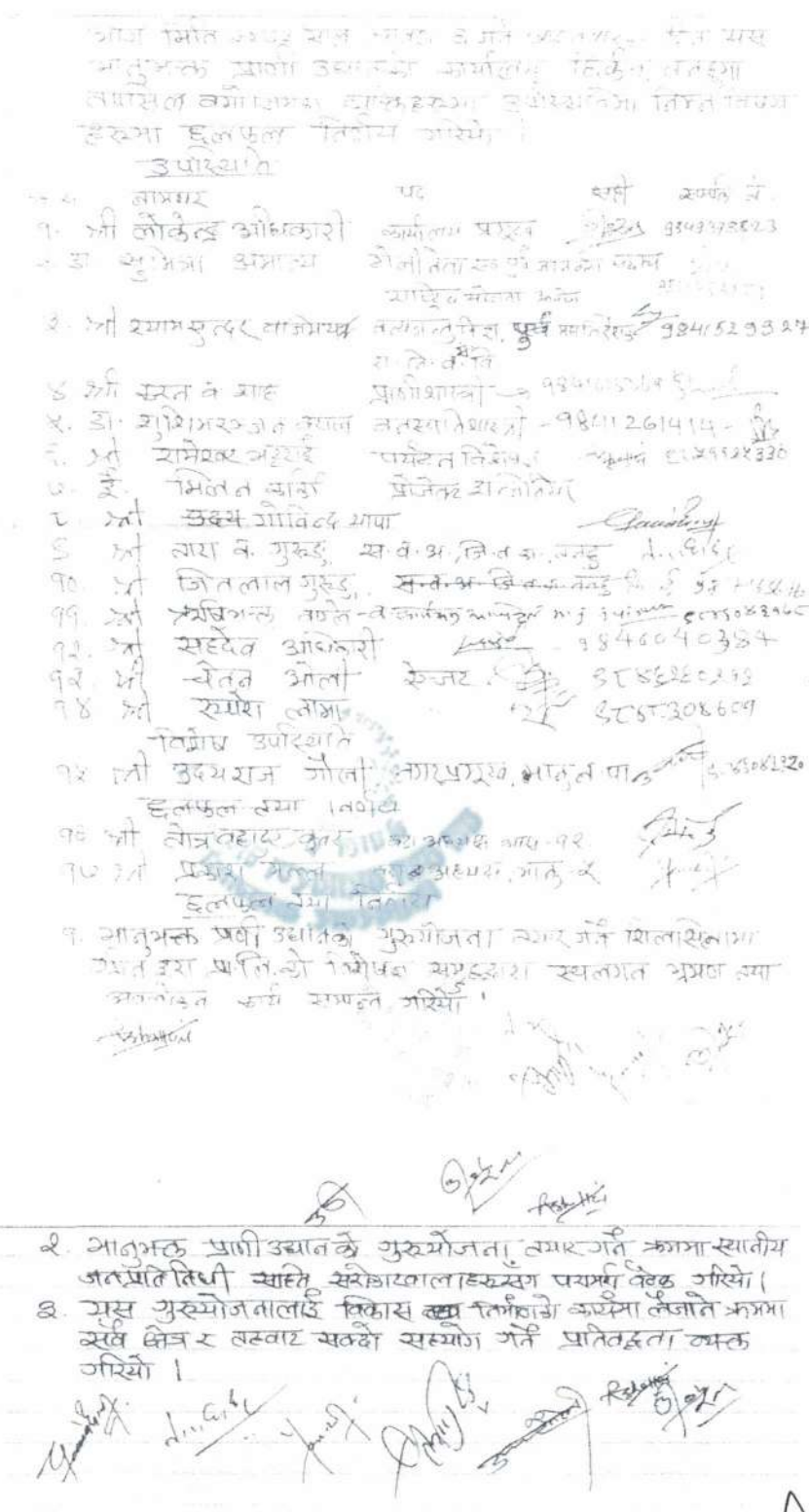
PV Formula and Calculation

Present Value! = FV / (1+r) n where: FV=Future Value, r=Rate of return, n=Number of periods

Phase	Year	Particulars	1							2								
			Intrance Fee							Parking								
			a. Local*		b. SAARC*		c. Foreigner*			a. Bike		b. Car		c. Bus		Total	a. Sovionir Shop (2*50000*12)	b. Cafe and Resturent (4*50000*12)
		Unit	person	Amount	Person	Amount	person	Amount	Total	no	Amount	no	Amount	no	amount			
1st	1	1st	180000	36000000	13000	6500000	87000	87000000	129500000	20000	400000	5000	550000	5600	1120000	2070000	1200000	2400000
	2	2nd	198000	39600000	14300	7150000	95700	95700000	142450000	22000	440000	5500	605000	6160	1232000	2277000	1200000	2400000
	3	3rd	217800	43560000	15730	7865000	105270	105270000	156695000	24200	484000	6050	665500	6776	1355200	2504700	1200000	2400000
	4	4th	239580	47916000	17303	8651500	115797	115797000	172364500	26620	532400	6655	732050	7454	1490720	2755170	1200000	2400000
	5	5th	263538	52707600	19033	9516650	127377	127376700	189600950	29282	585640	7321	10000	8199	1639792	2235432	1200000	2400000
		Rate	200	219783600	500	39683150	1000	531143700	622157139	20	2442040	100	805255	200	6837712	9704691	6000000	12000000
2nd	6	6th	289892	86967540	20937	12561978	140114	168137244	267666762	32210	1610510	8053	1610510	9019	2705657	5926677	1320000	2640000
	7	7th	318881	95664294	23030	13818176	154126	184950968	294433438	35431	1771561	8858	1771561	9921	2976222	6519344	1320000	2640000
	8	8th	350769	105230723	25333	15199993	169538	203446065	323876782	38974	1948717	9744	1948717	10913	3273845	7171279	1320000	2640000
	9	9th	385846	115753796	27867	16719993	186492	223790672	356264460	42872	2143589	10718	2143589	12004	3601229	7888407	1320000	2640000
	10	10th	424431	127329175	30653	18391992	205141	246169739	391890906	47159	2357948	11790	2357948	13205	3961352	8677248	1320000	2640000
		Rate	300	530945528	600	76692132	1200	1026494688	875197339	50	9832325	200	9832325	300	16518305	19378617	6600000	13200000
3rd	11	11th	466874	233436821	33719	25288989	225656	451311188	710036998	51875	5187485	12969	3890614	14525	7262479	16340577	1452000	2904000
	12	12th	513561	256780504	37091	27817888	248221	496442307	781040698	57062	5706233	14266	4279675	15977	7988727	17974635	1452000	2904000
	13	13th	564917	282458554	40800	30599677	273043	546086538	859144768	62769	6276857	15692	4707643	17575	8787599	19772099	1452000	2904000
	14	14th	621409	310704409	44880	33659644	300348	600695191	945059245	69045	6904542	17261	5178407	19333	9666359	21749309	1452000	2904000
	15	15th	683550	341774850	49367	37025609	330382	660764710	1039565169	75950	7594997	18987	5696248	21266	10632995	23924240	1452000	2904000
	16	16th	751905	375952335	54304	40728170	363421	726841181	1143521686	83545	8354496	20886	6265872	23393	11696295	26316663	1452000	2904000
	17	17th	827095	413547569	59735	44800987	399763	799525300	1257873855	91899	9189946	22975	6892459	25732	12865924	28948330	1452000	2904000
	18	18th	909805	454902326	65708	49281085	439739	879477830	1383661241	101089	10108941	25272	7581705	28305	14152517	31843163	1452000	2904000
	19	19th	1000785	500392558	72279	54209194	483713	967425613	1522027365	111198	11119835	27800	8339876	31136	15567768	35027479	1452000	2904000
	20	20th	1100864	550431814	79507	59630113	532084	1064168174	1674230101	122318	12231818	30580	9173864	34249	17124545	38530227	1452000	2904000
		Rate	500	3720381740	750	403041355	2000	7192738031	3311942984	100	82675150	300	62006362	500	115745710	76220058	14520000	29040000
		Total (Phase 1+2+3)		4471110869		519416637		8750376420	4809297461		94949514		72643942		139101227	105303366	27120000	54240000

3						5	6	7		Income	Expenditure					
Stalls/Lease/Rent													Cumulative			
c. Children Park (50000*12)	d. Conference hall (5*2000*12)	e. Mediation (75000*12)	f. Jeep Safari (1000*2*10*30*12)	Video Shooting	Total	Government budget (Federal)	Province and Local governmet	Conservation Partners	Total	discounting at 8 %	Total	discounting at 8 %	Cumulative Income discounting at 8 %	Cumulative Expenditure discounting at 8 %	Difference discounting at 8 %	Year
600000	120000	900000	7200000	1500000	13920000	50000000	30000000	20000000	245490000	227305556	3556803173	3293336272	227305556	3293336272	-3066030716	1
600000	120000	900000	7200000	1500000	13920000	52500000	31500000	21000000	263647000	226034808	52631480	45123011	453340364	3338459283	-2885118919	2
600000	120000	900000	7200000	1500000	13920000	55125000	33075000	22050000	283369700	224948004	57894628	45958623	678288368	3384417906	-2706129538	3
600000	120000	900000	7200000	1500000	13920000	57881250	34728750	23152500	304802170	224038694	63684091	46809708	902327062	3431227614	-2528900552	4
600000	120000	900000	7200000	1500000	13920000	60775313	36465188	24310125	327307007	222759649	70052500	47676555	1125086711	3490840183	-2365753472	5
3000000	600000	4500000	36000000	7500000	55578524	218973690	131384214	87589476	1125387733	1125387733		3490840183				
660000	132000	990000	7920000	1650000	15312000	63814078	38288447	25525631	416533595	262486820	77057750	48559454	1387573531	3539399637	-2151826106	6
660000	132000	990000	7920000	1650000	15312000	67004782	40202869	26801913	450274347	262730757	84763525	49458703	1650304288	3588858340	-1938554052	7
660000	132000	990000	7920000	1650000	15312000	70355021	42213013	28142008	487070103	263148821	93239878	50374605	1913453109	3639232945	-1725779836	8
660000	132000	990000	7920000	1650000	15312000	73872772	44323663	29549109	527210411	263736464	102563866	51307468	2177189573	3690540413	-1513350840	9
660000	132000	990000	7920000	1650000	15312000	77566411	46539846	31026564	571012975	264489492	112820252	52257606	2441679065	3742798019	-1301118954	10
3300000	660000	4950000	39600000	8250000	41608390	190204004	114122402	76081601	1316592354	1316592354		251957836				
726000	145200	1089000	8712000	1815000	16843200	199714204	119828522	79885682	1142649184	490062649	124102278	53225340	2931741714	3796023359	-864281645	11
726000	145200	1089000	8712000	1815000	16843200	209699914	125819948	83879966	1235258362	490538091	136512505	54210994	3422279805	3850234353	-427954548	12
726000	145200	1089000	8712000	1815000	16843200	220184910	132110946	88073964	1336129886	491292186	150163756	55214901	3913571991	3905449254	8122737	13
726000	145200	1089000	8712000	1815000	16843200	231194155	138716493	92477662	1446040064	492320306	165180132	56237400	4405892297	3961686654	444205643	14
726000	145200	1089000	8712000	1815000	16843200	242753863	145652318	97101545	1565840335	493618177	181698145	57278833	4899510474	4018965487	880544987	15
726000	145200	1089000	8712000	1815000	16843200	254891556	152934934	101956622	1696464662	495181863	199867959	58339552	5394692337	4077305039	1317387298	16
726000	145200	1089000	8712000	1815000	16843200	267636134	160581680	107054454	1838937653	497007751	219854755	59419914	5891700089	4136724953	1754975136	17
726000	145200	1089000	8712000	1815000	16843200	281017941	168610764	112407176	1994383485	499092531	241840231	60520283	6390792619	4197245236	2193547383	18
726000	145200	1089000	8712000	1815000	16843200	295068838	177041303	118027535	2164035719	501433183	266024254	61641029	6892225802	4258886265	2633339537	19
726000	145200	1089000	8712000	1815000	16843200	309822280	185893368	123928912	2349248087	504026966	292626679	62782529	7396252768	4321668794	3074583974	20
7260000	1452000	10890000	87120000	18150000	52349777	757030443	454218266	302812177	16768987437	4954573704		578870775				
13560000	2712000	20340000	162720000	33900000	149536691	1166208136	699724882	466483254	Total	7396553790		4321668794				

Annex 8: Meeting Minute and Photo



आज मिति २०६८ साल माघ १५ गते मातृभक्त प्राणी उद्यानको गुरुयोजना तयारी सम्बन्धमा राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभागका उप-महानिर्देशक श्री रामचन्द्र कंडेलको संयोजकत्वमा बैठक तपसिलको उपस्थितिमा बसियो ।

उपस्थिति :

१. श्री रामचन्द्र कंडेल, उप-महानिर्देशक, रा. नि. तथा व. ज. सं.
२. श्री [illegible], [illegible] - [illegible]
३. श्री वीरेन्द्र प्रसाद कँडेल अ. प्र. मातृभक्त प्राणी उद्यान.
४. श्री सन्तोष कुमार भगत, [illegible]
श्री रामेश्वर भट्टराई पर्यटन विद ग्रीन डरा प्रा. लि.
५. श्री शंकर अर्याल सिभिल इन्जिनियर आर. आई. डी. सी. प्रा.लि.
६. श्री विष्णु प्रसाद पाण्डे सिभिल इन्जिनियर आर. आई. डी. सी. प्रा. लि.
श्री सुरेन्द्र अर्याल, रा. नि. तथा व. ज. सं. विभाग
श्री श्याम कुमार शाह " " " "
श्री सुमन ढकाल, कार्यक्रम अधिकृत, ग्रीन डरा प्रा. ली.
श्री सन्तोष अधिकारी, वित्त सहायक, " " "

आज मिति २०७७ साल श्रावण १४ गते बिहिवारका दिन राष्ट्रिय निकुञ्ज तथा वन्यजन्तु संरक्षण विभाग, बबरमहलमा देहायको उपस्थितीमा आरक्षण प्राणी उद्यानको गुरु योजना सम्बन्धी ग्रीन इरा प्रा. लि. र आर आइ डि सी जे ले प्रस्तुतिकरण गरी निम्नानुसारको छलफल एवं सुझाव संकलन गरियो ।

उपस्थिती

1) डा. रामचन्द्र कँडेल, नि. महानिर्देशक, रा. नि. तथा व.ज.सं.वि.
2) श्री वेद कुमार ढकाल, अनुसन्धान अधिकृत, रा. नि. तथा व.ज.सं.वि.
3) श्री हरीन्द्र आचार्य, इकोलोजिष्ट, रा. नि. तथा व.ज.सं.वि.
4) श्री श्याम कुमार साह, व्यवस्थापन अधिकृत, रा. नि. तथा व.ज.सं.वि.
5) श्री विष्णु श्रेष्ठ, योजना अधिकृत, रा. नि. तथा व.ज.सं.वि.
6) श्री अशोक भण्डारी, सं. शि. अधिकृत, रा. नि. तथा व.ज.सं.वि.
7) श्री वीरेन्द्र प्रसाद कँडेल, अ. तथा प्र. अधिकृत, रा. नि. तथा व.ज.सं.वि.
8) श्री लाल बहादुर भण्डारी, निर्देशक, राष्ट्रिय प्राणी उद्यान
9) श्री नरेन्द्र अर्याल, स. व्य. अधिकृत, रा. नि. तथा व.ज.सं.वि.
10) श्री विष्णु प्रसाद थपलिया, का.मु.प्र.वे.अ., रारा राष्ट्रिय निकुञ्ज
11) श्री रमेश्वर भट्टराई, व्यवस्थापन निर्देशक, ग्रीन इरा प्रा. लि.
12) श्री सुमन ढकाल, कार्यक्रम अधिकृत, ग्रीन इरा प्रा. लि.
13) श्री रूपक महर्जन, संरक्षण अधिकृत, आरक्षण प्राणी उद्यान
14) श्री प्रतिनाथ रेग्मी, उप-सचिव (लेखा), रा. नि. तथा व.ज.सं.वि.
15) श्री सन्तोष अधिकारी, लेखा अधिकृत, ग्रीन इरा प्रा. लि.
16) श्री रविन्द्र कार्की, कम्प्युटर अधिकृत, रा. नि. तथा व.ज.सं.वि.

निर्णयहरू :-

1) आरक्षण प्राणी उद्यानको गुरु योजना सम्बन्धी भएको प्रस्तुतिकरणमा छलफल सहित अझ परिस्कृत गर्नको लागि सुझाव संकलन गरियो । प्राप्त भएका सुझावहरू यथासम्भव गुरु योजनामा समावेश गर्ने निर्णय गरियो ।
2) आरक्षण प्राणी उद्यान संचालन गर्ने व्यवस्थापकीय मोडल र सांगठनिक संरचनाहरूको सम्बन्धमा थप छलफल गरी र सोही अनुसार गुरु योजनामा स्पष्ट हुन आवश्यक देखिएको र समावेश गर्नुपर्ने देखियो ।

3) आरक्षण प्राणी उद्यानमा निजी जग्गा अधिग्रहण र मुआब्जा वितरण सम्बन्धमा पटक पटक छलफल भएपनि हालसम्म मुआब्जा वितरण कार्य अगाडी नबढेको र चालु आ.व. ०७७/०७८ को स्वीकृत बजेट कार्यक्रममा मुआब्जा सम्बन्धी कामकारवाही गर्ने बजेट पनि नभएको हुँदा मुआब्जा वितरण को कार्यमा अन्यौलता र जटिल भएको अवस्थामा समेत छलफल भयो ।

Photos: