

MASTER PLAN (2<sup>nd</sup>)

Sepahijala Zoological Park and Safari,  
Tripura (INDIA)

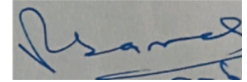


2023-24 to 2043-44

**Department of Forests,  
Government of Tripura**

**CERTIFICATE**

This is to certify that the 2<sup>nd</sup> Master Plan (2023-24 to 2043-44) for scientific management of Sepahijala Zoological Park and its redevelopment as Sepahijala Zoological Park and Safari has been prepared by the Sepahijala Zoological Management in consultation with 'M/s Brij Raj Sharma and Associates Pvt Ltd, New Delhi (India)'.



**Chief Wildlife Warden,  
Tripura (India).**

**Central Zoo Authority,  
Ministry of Environment, Forest and Climate Change,  
Government of India**

The Master Plan is approved, subject to the condition that the responsibility of mobilizing resources for implementation of the Master Plan will be sole responsibility of the Sepahijala Zoological Park & Safari, Tripura (India).



सचिव/Member Secretary  
केन्द्रीय जन्तुसन्तान संस्थान/Central Zoo Authority  
पर्यावरण वन वनस्पति विभाग/Ministry of Environment, Forest & Climate Change  
नयाँ दिल्ली, भारत  
Govt. of India, New Delhi

**Member Secretary,  
Central Zoo Authority,  
Ministry of Environment, Forest and Climate Change,  
Government of India.**

## Acknowledgement

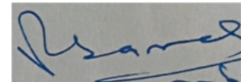
As per the Recognition of Zoo Rules, 2009, it is mandatory for a recognised zoo in India to prepare a long-term master plan for its development and submit the same to the Central Zoo Authority for approval. Accordingly, a Master Plan (1<sup>st</sup>) for scientific management and development of Sepahijala Zoological Park for the period from 2012-13 to 2022-23 was prepared by the Zoo Management Authorities in the year 2012 and submitted to the Central Zoo Authority, which was approved by Central Zoo Authority in the year 2012 only. Successive development of the Zoo continued as per the approved Master Plan under the esteemed guidance of Central Zoo Authority, New Delhi.

New Master Plan (2<sup>nd</sup>) has been prepared for redevelopment of Sepahijala Zoological Park (68.04 hectares) as Sepahijala Zoological Park and Safari at the same location in an area of 94.90 hectares, as per the format developed by the Central Zoo Authority for the purpose. A budget proposal of Rs 255.75 crores has been made for the period from 2024-25 to 2029-30 for implementation of the Master Plan.

A professionally run Zoo will play great variety of roles to benefit both the animals it displays and the visiting public. Sepahijala Zoological Park and Safari will showcase the rich biodiversity of north-eastern region of India in general and Tripura state in particular. Breeding programmes shall help in propagating endangered species and to continue gene pools for species whose habitats have been obliterated. Educational programmes shall help to foster the respect wild animals deserve and familiarize the visitors with the important role these animals

play in the ecosystem. The Zoo may have to serve as the last bastion for threatened and endangered species of the region.

I sincerely thank experts and subject matter specialists (Shri SK Patnaik, IFS (Rtd); Dr BrijRaj Sharma, IFS(Rtd); Prof (Dr) Rommel Mehta; Dr L N Acharjyo; Prof (Dr) D Swarup, Dr K M Soni, and Prof BC Choudhary) of 'M/s Brij Raj Sharma and Associates Pvt Ltd, New Delhi (India)' for their expert guidance and compilation of the Master Plan. I would also like to thank all the officials and staffs of Sepahijala Zoological Park for their contribution in preparing the document.



Chief Wildlife Warden,  
Tripura (India).

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## PART - 1

### Chapter 1

#### 1.1 Introduction

The best strategy for the long-term protection of wildlife is its conservation in its natural community in the wild. Only in natural communities are species able to continue their process of evolutionary adaptation to a changing environment. However, in the face of increasing human activities, wildlife and its habitat is getting more and more threatened because of factors like demographic and environmental variability, insufficient habitat, deteriorating habitat quality, habitat fragmentation, loss of genetic variation, inbreeding depression, competition from invasive species, disease, excessive hunting and collecting. Extrapolating the trends, it seems most of the species will survive only in undersized protected areas, where curatorial management and veterinary aids are available. Many will be viable only as a part of a meta-populations maintained by translocations or re-introductions. It is likely that the only way species in such circumstances can be prevented from going extinct is to maintain individuals in artificial conditions under human supervision. The expertise, infrastructure and stock of wild animals in various captive breeding facilities including zoos can play a pivotal role in saving many species from extinction. *Ex-situ* wildlife conservation is a young and controversial discipline, seen by some as inspiring and important, while others view these efforts as overreaching, expansive and inefficient use of resources. Despite the controversy, *ex-situ* wildlife conservation is evolving into a

key discipline for conservation of critically endangered wild animal species. The history of re-introduction from captive propagation is discouraging, but hardly more so than preservation in nature. Each approach has something to offer, but each alone is too specialized for the complexity of modern conservation and multiplicity of responses it depends upon. Major task of conventional conservation organizations is to save functioning ecosystems. Whereas major task for zoos and other captive wild animals related facilities is to assist in saving non-functional ecosystems. What matters most is that animals should survive in sufficient variety and numbers, and with enough of their behaviour intact, to take them back to the wild at some more relaxed and enlightened times in future. Captive wild animal facilities and zoos can help that to happen. If an animal lives as a member of a social group that is proper for its species, feeds upon its near natural feed, find its own mate and rear its own offspring, it does not seem to matter over much, if it is also protected from predators, or its area has limitations. Conservation breeding should be seen to be only a part of the spectrum that extends from the intensive care to the wilderness, of the conservation endeavour. Extinction crisis continues apace worldwide. Solutions are being sought on several fronts, with multi-country agreements. Captive wild animal facilities should also position themselves, to make a useful and meaningful contribution to the conservation of wildlife.

The need for *ex-situ* conservation of wild fauna as one of the main objectives for management of zoos was realized by the Government of India soon after independence and the then Indian Board for Wildlife (now the National Board for Wildlife) made important recommendations in this regard. The Central Zoo

Authority was established in the year 1992 to oversee the functioning of Indian zoos and to guide them for their scientific management and development. To give proper direction and thrust to the management of zoos in the country, the National Zoo Policy was framed and adopted by the Government of India in the year 1998. National Wildlife Action Plan (2017-31) also lays emphasis on the role of zoos for *ex-situ* breeding of endangered species of wild fauna and their rehabilitation in to the wild and if implemented properly will be able to save some more critically endangered wild animal species in the subcontinent.

India, with its 328.7 million hectare of land mass, occupies 2.4% of world's total land area. The population of India was over 1250 million in 2011 constituting about 16.7% of world's population. The total area under forest and tree cover in India is around 80 million hectares, which is nearly 24% of its total land area. Protected areas comprising of national parks, wildlife sanctuaries, community reserves and conservation reserves with overlapping of tiger reserves and elephant reserves cover an area of around 16 million hectares and making up about 5% of the total geographic area and 23% of total forest cover of the country. India is among the 12 mega biodiversity countries of the world. 350 species of mammals, 1224 species of birds, 408 species of reptiles, 197 species of amphibians, 2546 species of fishes, 57548 species of insects and 46286 species of plants found in India form 8% of the world's diversity of life forms. The country stands out as a treasure trove of natural wealth despite its fair share of problems and responsibilities. There is an urgent need to conserve its forests and wildlife.

North-eastern region of India with total land area of 2,55,511 sq. km has about 35 percent of its geographical area under forest cover, effectively making it a

biodiversity hub - home to a plethora of flora and fauna that thrive in this evergreen environment. North-eastern India is known for its biodiversity. It is one of the two biodiversity hotspots of India. Half of the total number of floral species, known in India, occurs here, and the region forms the richest reservoir of genetic variability. The forests in the region, despite the destruction of forests by slash and burn cultivation, have survived and regenerated time and again.

Forests in the north-eastern region of India are made up of many forest types, namely tropical wet evergreen, tropical semi evergreen, tropical moist deciduous, tropical dry deciduous, sub-tropical pine forests and savannah grasslands. These jungles are home to many mammals like royal Bengal tiger, Asiatic elephant, great Indian rhinoceros, clouded leopard, hoolock gibbon, eastern swamp deer, Assamese macaque, spectacled langur, stump-tailed macaque, pig tailed macaque, mongoose, Indian giant squirrel, red panda, water buffalo, and Chinese pangolin are some of the animals sighted in these forests.

The avian population (endemic as well as migratory) of this region makes this a rewarding destination for naturalists and birdwatchers. Hornbills, adjutant storks, Bengal florican, spot-billed pelican, white-winged wood duck, great grebe, osprey, purple heron, whistling teal, Blyth's tragopan, white ibis and dark-rumped swift are some of the species spotted here.

The state of Tripura in north-eastern region of India with total geographical area of 10491 sq. km, of which 6294.29 sq. km (59.99%) is under forest cover is predominantly hilly (60%) & is surrounded on three sides by a deltaic basin of Bangladesh. It shares border (1001 km in perimeter) with Bangladesh, Assam and Mizoram. International border with Bangladesh is 856 km, which is almost

completely open and porous. The state is situated between 22o57' & 24o32'N and 91o10' & 92o20'E with tropic of cancer passing through it. The State is situated in The south-western extremity of north-eastern region of The country. Forests in the State are mainly tropical evergreen, semi evergreen, and moist deciduous. Sizeable area is covered with bamboo brakes which virtually form a "sub-climax" resulting from shifting cultivation from time immemorial.

There are 6(six) number protected areas in theState, which include 4(four) wildlife sanctuaries[Sepahijala WLS (13.46 sq. km), Trishna WLS (163.08 sq. km), Gomati WLS (389.54 sq. km)and Rowa WLS(0.86 sq. km)] and 2(two) national parks[Clouded Leopard National Park (5.08 sq. km) and Bison National Park (31.63 sq. km)]. Both the National Parks are located within the Wildlife Sanctuaries. Among the forest area percentage of PAs in Tripura is about 9.59%.

## **1.2Name and location**

The Sepahijala Zoological Parkis situated near the city of Bishalgarh in district Sepahijala of Tripura State. This is the only Zoo in the State and is situated around 30 km from the state capital Agartala. The Sepahijala Zoological Park is recognized by the Central Zoo Authority as a "Medium Category Zoo". The Zoo was established within Sepahijala Wildlife Sanctuary (and adjoining Clouded Leopard National Park) famous for Clouded leopards and a house for variety of birds, mammals, and other wild animals. As the area is a natural habitat for variety of endangered animals, the Central Zoo Authority has identified the Zoo for taking up its flagship coordinated conservation breeding programme for many species. The Zoo has been identified as the Coordinating Zoo for Conservation Breeding

Programme of Clouded Leopard (*Panthera nebulosa*), Binturong (*Arctictis binturong*), Pig-tailed Monkey (*Macaca nemestrina*), Phayre's leaf Monkey (*Trachypithecus phayrei*) and as participating Zoo for conservation breeding of Hoolock Gibbon (*Hoolock hoolock*), towards the Zoo is making its sincere efforts.

Sepahijala Zoological Park, Tripura is an important tourist destination and attracts lakhs of nature lovers every year. Visiting the Zoo leaves an experience of pilgrimage into nature among visitors. There has been a tremendous effort to maintain its serenity amidst the densely urban conglomeration. The Zoo authorities always aimed at the exhibition of animals in excellent natural surroundings, meeting their physical, behavioural, and psychological needs, so that animals display their natural behaviour.

As the Zoo is visited by lakhs of people every year, opportunistically the Zoo is educating the public to create awareness on the conservation of nature and its resources, environment, forest, and wildlife. Many visitors are children/ students, and they could be the ambassador for spreading the message of conservation across. The Zoo's conservation endeavors are not limited to the walls of the Zoo premises, but also help save wild animals by taking rescue operations, whenever the calls come from the public. The Zoo is also playing a role in animal health management of such rescued animals by minimizing and managing animal-human conflicts. The disciplined Zoo staff are devoted to animal welfare and security and thrive to provide a healthy environment for these animals.

### **1.3 History of the Zoo**

The story goes that there was a camp of “*sepoy*” of the then *Mabharaja* of Tripura on the side of marshy area locally called “*jala*” near existing Forest Training School, Sepahijala. Thereafter, the name of this place was coined as Sepahijala. Earlier, this area was highly rich in wild flora and fauna. With the rapid expansion of population, the pressure on the forest of Sepahijala increased resulting gradual diminishing of forest cover. In order to protect this hot spot of biodiversity, an idea of setting up of a Bio-Complex was mooted and therefore Sepahijala Bio-Complex came into existence in the year 1972 with setting up of a botanical garden and a small deer park. The deer park was gradually elevated to the status of Zoo. First Master Plan of the Sepahijala Zoological Park for the period from 2012-13 to 2022-23 was prepared by the Zoo Management with the layout plan spread over an area of 68.04 ha, which was approved by the Central Zoo Authority in the year 2012. Copy of the approved (1<sup>st</sup>) Master (layout) Plan is placed as **Annexure-1**.

### **1.4 Objectives**

#### **1.4.1 Vision**

There has been worldwide concern for conservation and protection of biodiversity for very existence of mankind. With increasing pressure of population, biodiversity has been getting depleted day by day. The significant factor is the diminishing of wild animals with great rapidity. The habitats being shrunk rapidly, their conservation has become arduous, which warns to have conservation in captivity. Sepahijala Zoological Park is one such effort, where in

more than 50 species of wild animals have been kept for conservation and propagation.

#### **1.4.2 Mission of the Zoo**

To conserve and breed endangered & rare fauna, particularly the primates, Clouded Leopard, Binturong for subsequently restoring the biological attributes and diversity of wildlife in the forests of Tripura in particular and north-eastern India in general.

- To generate database about the behaviour, breeding, population dynamics and veterinary care of the animals kept in the Zoo for helping the conservation of these animals in the long run.
- To educate people about the faunal richness of the State & the Country, for their support for conservation of biodiversity in the State and the Country.
- To develop eco-tourism potential for the people of the State.
- Wildlife education and interpretation for the purpose of communicating conservation values to the visiting public for better understanding and appreciation of wildlife and its role in the eco-system.
- Captive breeding for the purpose of display and exchange with other zoos and rehabilitation of endangered and threatened species.
- Scientific study and Research on animal behavior, nutrition, reproduction disease etc.
- Recreation for the purpose of providing wholesome, healthy and educational activities to a large number of people by utilizing the natural setting without detriment to any of the preceding objectives.

### **1.4.3 Strategy of the Zoo**

The strategy of Sepahijala Zoological Park is to conserve the endemic fauna of the north-eastern region of India in general and state of Tripura in particular by captive breeding and providing naturalistic enclosures for fulfilling the requirements of animals on scientific line. Also to display few exotic animals to cater the demand of the local visitors. This attempt is a support to in-situ conservation.

### **1.4.4 Objectives**

The Zoo in the initial stage started to provide recreation to the people of the State and accordingly it started its journey in the shape of a deer park in the year 1972 and the objectives kept on changing as per guidelines of Central Zoo Authority and now the main objective of the Zoo is (1) conservation (2) conservation education (3) Research for conservation & Rescue and Rehabilitation as enshrined in National Zoo Policy, 1998.

## **1.5 Physical features**

### **1.5.1 Topography of the area**

The Sepahijala Zoological Park is situated in Bishalgarh Sub-Division of Sepahijala District of the state of Tripura. It is situated within 23°37" to 23°42" North latitude and 91°17" to 91°21" East Longitude. The area is undulating with small hillocks; locally called *tillas* interspersed and valleys called *lungas*. The altitude of the area is around 50.00 mt. above mean sea level.

### **1.5.2 Geological features**

No survey information is available from the geological survey of India. However, the facts available from the working plans of the Forest Department of Tripura

and a report from the Department of Science, Technology & Environment, Government of Tripura (State of Environment in Tripura, 1989) gives the following information. Here we are dealing with Tripura in general with reference being made to the Sepahijala Zoological Park and the nearby areas. Rock is semi consolidated sediment mostly and the soil is mostly sandy loam with red loam. The present form of land that we find in the State is the result of weathering and erosion by river and streams.

### **1.5.3 Flora & Fauna**

#### **1.5.3.1 Flora**

The Zoo is composed of natural vegetation originally existed throughout the area on which Sepahijala Wildlife Sanctuary has been declared. The composition of the crop is mostly moist deciduous type with semi evergreen vegetations in the lungas. Top canopy trees consist of *Albizzia procera*, *Albizzia stipulata*, *Artocarpus chaplasi*, *Bursera serrata*, *Careya arborea*, *Garuga pinnata*, *Gmelina arborea*, *Schima wallichii*, *Shorea robusta*, *Sterculia villosa*, *Syzygium cminii*, *Terminalia bellirica*, *Vitex pendencularis*, *Sterospermim spp.*, and *Michellia* species. The middle storey is composed of *Careya arborea*, *Dillenia pentagyna*, *Lagerstroma parviflora*, *Mallotus philipensis*, *Premna begalensis*, *Bridelia spp.*, *Michellia spp.* and *Wrightia* species.

The undergrowth consists of *Coffea begalensis*, *Clerodendron infortunatum*, *Eupatorium audoratum*, *Flamingo chappar* and *Imperata spp.* Undergrowth vegetation is usually sparse around the flat areas and gentle slopes but thicker in most other areas. Climbers such as *Acacia pinnata*, *Bahinia velai*, *Butea parviflora*, *Dalbergia stipulata*, *Mikania scandens* and *Pachycarpa* are found in this forest.

The canopy within mixed forest is very much broken. Detailed list of flora available in the Zoo premises and Sepahijala Wildlife Sanctuary has been shown in the **Annexure-2**.

### **1.5.3.2 Fauna**

Since the Zoo is situated within the Sepahijala Wildlife Sanctuary and the peripheral boundary fence is not considered, most of the species available in the Sanctuary have access to the Zoo area comprising of 68.04 hectares. The species are rhesus macaque, pig tailed macaque, slow loris, spectacled langur, capped langur, leopard cat, jungle cat, clouded leopard, common palm civet, Himalayan palm civet, large Indian civet, small Indian civet, wild boar, Indian porcupine, crab eating mongoose, barking deer, pangolin, flying squirrel and among reptile are python, king cobra, monitor lizard and in addition 124 species of birds are found within this Sanctuary which are also seen in the Zoo premises. Some of them are red jungle fowl, hill myna, pied hornbill, crested serpent eagle, brahmini Kite, king fisher, white ibis, kalij pheasant, great egret, etc. Detailed list of fauna in the free ranging state in the Zoo premises is annexed (**Annexure-3**).

### **1.5.4 Climate**

The climate is very interesting that it is neither too hot nor too cold.

#### **1.5.4.1 Temperature**

The summer temperature varies from 14.9° C to 35.6° C and that of winter from 9.6° C to 33.6° C. The June is generally the hottest month and January happens to be the coldest month in this area. There is no incident of frost over the area.

#### **1.5.4.2 Rainfall**

The area receives around 230 cm of rainfall each year with in more or less 90 rainy days, well distributed from May to October. Approximately 63% of the total annual precipitation is received between June and September. Pre-monsoon showers are usually received between the last week of March and mid-April.

#### **1.5.4.3 Humidity**

Due to a well distributed rainfall and warm climate, relative humidity in this area is quite high and, on an average, varies from 59% to 99%. During January and February, the maximum humidity reached upto 99 % and minimum is 63 %.

#### **1.5.4.4 Wind**

Wind velocity round the year is mild. Wind velocity during summers is maximum 5.5 Km./hour and minimum 0.2 Km./hour and winters is maximum 3.1 Km./hour and minimum 1.5 Km./hour. But during the pre-monsoon & monsoon, the wind velocity sometimes goes very high due to prevailing cyclonic weather which causes uprooted and damages of trees and houses.

#### **1.5.4.5 Water**

There is no natural source of water over the area. However, 3(three) *cherras* (streams) namely Bijoy nadi, Kalapani and Latiacherra flow just outside the boundary of Sepahijala Wildlife Sanctuary and are the main sources of water for the locality. Some manmade water bodies like Amritsagar, Ratiabil, Abhasarika lake etc are the perennial sources of water for drinking of wild animals within the Sanctuary.

#### **1.5.4.6 Season**

There are normally six seasons of which Winter, Summer, Rainy season and Autumn are the main seasons.

#### **1.6 Approach**

The Zoo is situated within Sepahijala Wildlife Sanctuary (adjoining Clouded Leopard National Park) in West Tripura District and about 30 km. away from Agartala, the State capital. It is surrounded by lush green forests on three sides and by a road on the northern Side. The Zoo is situated at a distance of 4 Km from Agartala-Udaipur road (National Highway) at gate No-1, where the visitors get down from the public transport. They have to move on foot beyond that which is troublesome for children and old people or have to hire electric vehicles (the Zoo's initiative) from gate number-1 to Zoo gate to visit the Zoo, in case they do not have their own means of transportation.

Agartala is the nearest Airport which is about 28 km. from Sepahijala and is well connected by daily flights from Kolkata, Guwahati and Delhi. The nearest Railway Station is at Bishalgarh, which is about 5 km from Sepahijala and it is connected to railways in Agartala and then with Assam state. The nearest township is Bishalgarh the sub-divisional head quarter which is only 7.0 km. from the Zoological Park. The facilities like fuel stations, hospitals, wireless station, local transport service, small hotels are easily available at Bishalgarh.

#### **1.7 Demography of the surrounding area**

The area being located within the sanctuary of 18.53 sq. km and surrounded by natural forest cover is of great ecological importance and suitable for housing the animals in the natural environment. The State is located in the Bio-geographic

zone of 9B-North-East Hills and possesses an extremely rich biodiversity, which is getting increasingly threatened. Situated in the Indian sub-region of Oriental Zoogeographic region, local flora and fauna bear a very close affinity and resemblance with floral and faunal components of Indo-Malayan and Indo-Chinese sub-regions

### **1.8 Legal status of the land**

Sepahijala Zoological Park is situated within Charilam Reserve Forest, which has been declared as Sepahijala Wildlife Sanctuary in the year 1987.

### **1.9 Source of pollution (if any)**

There is no source of pollution as such as the Zoo is situated inside the natural surroundings.

## Chapter – 2

### 2.1 Appraisal of present arrangements and constraints

The Sepahijala Zoological Park was initiated as a small deer park in 1972 and has steadily evolved over the years. Through the introduction of diverse animal species and construction of specialized animal housings, the Zoo has become an important tourist destination in Tripura, attracting lakhs of nature lovers every year. It has also emerged as a hub for conservation efforts and wildlife education in the region.

Master Plan(1<sup>st</sup>) of the Zoo for the period from 2012-13 to 2022-23 has served as the guiding force for Sepahijala Zoological Park, acting as a strategic cornerstone for its sustained growth and development over the past decade. This comprehensive document has provided a well-structured and long-term approach, emphasizing the pivotal role it played in supporting the Zoo's multifaceted operations. Over the past decade, the Zoo has diligently adhered to the Master Plan, leading to notable advancements in crucial aspects such as animal housing, healthcare, education, and conservation.

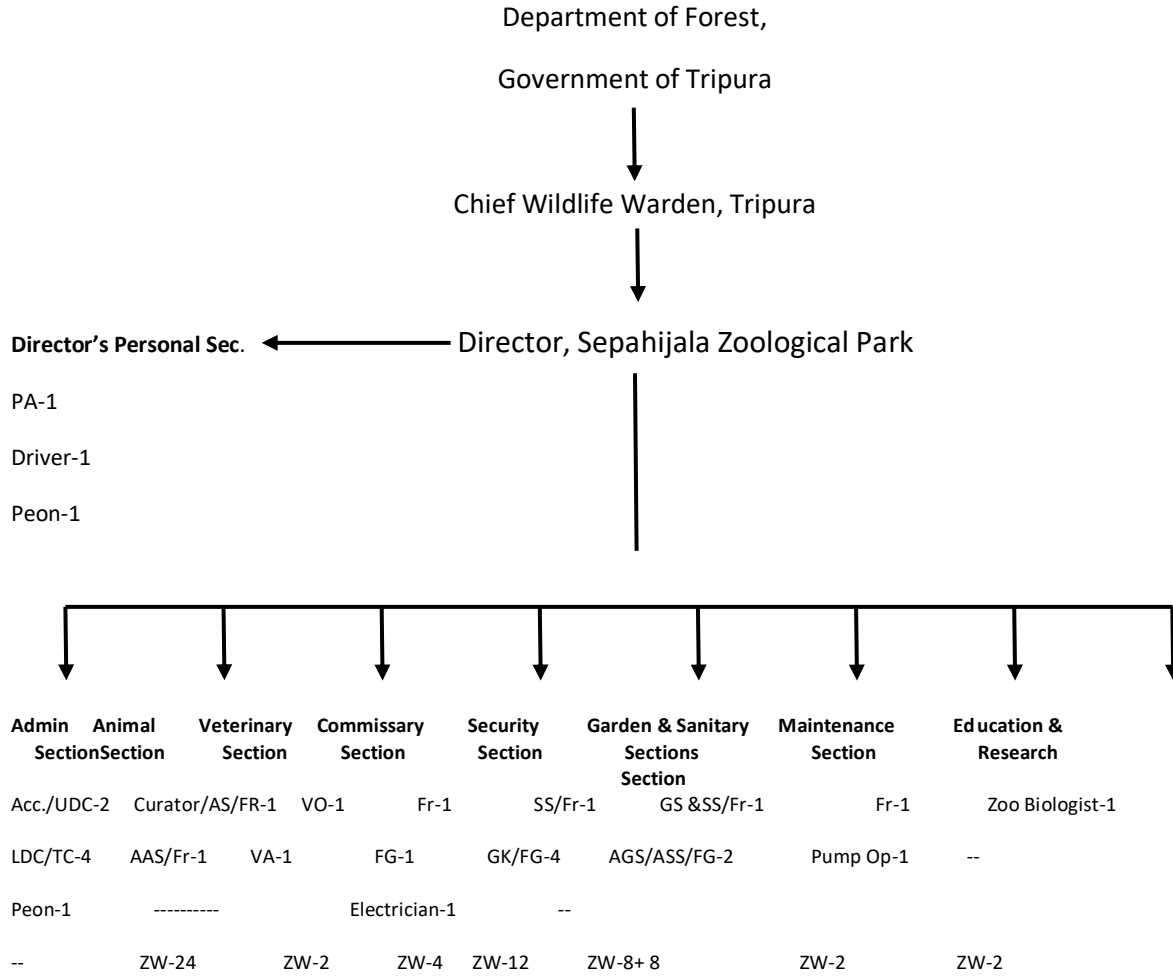
The success of the previous Master Plan can be attributed to its focus on a holistic and forward-looking approach. By meticulously addressing the needs of the Zoo's diverse facets, including the well-being of its animal inhabitants, educational outreach, and conservation initiatives, the plan enabled the Sepahijala Zoological Park to navigate through the challenges of the past decade. The commitment to maintaining excellent natural surroundings, ensuring psychological well-being, and exhibiting animals in conditions that facilitate their natural behaviour has been a guiding principle.

The acknowledgment of the Zoo's achievements amid the challenges posed by the COVID-19 pandemic underscores the resilience of the Sepahijala Zoological Park's dedicated team. The collaboration between field officers, veterinarians, biologists, animal keepers, and administration & clerical staff has been instrumental in the Zoo's continued success. As the Master Plan for the period 2012-13 to 2022-23 undergoes appraisal, there is optimism that the Zoo's commitment to excellence and its multifaceted approach will propel it towards even greater achievements in the years to come.

## **2.2 General Administration**

Sepahijala Zoological Park has been developed and is being managed by the Forest Department, Government of Tripura. The Chief Wildlife Warden, Tripura is the overall administrative head of the Zoo. The Zoo Director designate is responsible to look after day-to-day administration of the Zoo and is assisted by good number of staffs. For better control and management of the Zoo and as per provisions of Wildlife Protection (Act), as well as, to fulfil the condition laid by the Central Zoo Authority, the Director of the Zoo has been declared as Head of Office and also have DDO powers w.e.f. Jan'2009.

### **2.2.1 Organisational Chart**



**LEGEND FOR READING ABOVE CHART:**

- VO: Veterinary Officer
- FR: Forest Ranger
- AS: Animal Supervisor
- SS: Security Supervisor
- GS: Garden Supervisor
- SS: Sanitary Supervisor
- Fr: Forester
- AAS/AGS/ASS: Assistant Animal/Security/Garden/Sanitary Supervisor
- FG: Forest Guard
- GK: Gate Keeper
- VA: Veterinary Assistant
- ZW: Zoo Worker (non-cadre Posts)

## **2.3 Administration Section**

The Director designate is responsible for day-to-day operation and maintenance of the Zoo. He is assisted by Curator, Veterinary Officer, Zoo Biologist and other support staff.

The Administration Section looks after the requirements and maintenance for smooth operation of the Zoo. This Section also undertakes correspondence with the office of the Chief Wildlife Warden, Tripura and other related departments of the Government of Tripura, Central Zoo Authority, and other zoos. The Administration Section is also entrusted with preparation of the Plan and Non-Plan budget.

### **2.3.1 Duties and responsibilities**

- i. To maintain diary and dispatch of letters.
- ii. To invite tenders for supply of diet articles.
- iii. To process for outsourcing the various works and to engage manpower on contract.
- iv. To co-ordinate various meetings.
- v. To undertake correspondence with departments in the state of Tripura, CZA and other zoos.
- vi. To procure furniture, stationary, liveries for employees, etc.
- vii. To prepare plan and non-plan budget and revised estimates.
- viii. To issue salary slip, GPF statement and Form-16 of income tax.
- ix. To maintain record of visitor's data and revenue collected.
- x. To submit monthly statement of expenditure to the concerned department.

- xi. To prepare duty roaster for booking counters.
- xii. To maintain cash book, contingency register, cheque and challan registers.
- xiii. To deposit cash collected from gate and other sources.
- xiv. To keep record of entry tickets.
- xv. To send attendance details to accounts & administration section.

### **2.3.2 Administrative Building**

Administrative Building presently exists in the nearby Forest Training Institute. The Director's chamber, sitting arrangement for secretarial staffs with other amenities like computer facilities, LCD projector, printers, bookshelves and furniture, etc have been provided in the Administrative Building.

### **2.3.3 Existing staff**

Director - 1

PA to Director - 1

Accountant/UDC –2

LDC/Ticket Clerk - 4

Driver - 1

Office Peon - 2

### **2.4 Animal Section**

This Section is responsible for looking after day-to-day animals care and their house keeping. It ensures cleanliness and maintenance of enclosures and surroundings. The staff of the Section strives hard to maintain hygienic conditions of the enclosures as well provide clean food and water to the inhabitants. The

Animal Section is operating under the direct supervision of the Curator, has successfully implemented a structured management approach. The Zoo is efficiently divided into different beats, each with a designated supervisor, supported by Animal Keepers and an appropriate number of Zoo Workers. These teams are responsible for day-to-day care, feeding, maintenance of enclosures, and observation of animal behaviour. The divisions include beats for primates, reptiles, aviaries, carnivores, omnivores, deer park, herbivores, rescue centre, and captive breeding centre (CBC). This organization ensures that each beat operates seamlessly, with a detailed distribution of enclosures and the number of animals under the care of the dedicated staff, including conservation breeding centre. This comprehensive approach to animal supervision has significantly improved the well-being and management of the Zoo's diverse residents.

#### **2.4.1 Duties and Responsibilities**

- i. Cleaning of the animal enclosures, night shelters and surroundings daily.
- ii. Providing feed & water to the animals and to submit regular ration requisition according to need.
- iii. Reporting the issues related to animals' health, feeding, mating, breeding etc.
- iv. Ensuring safe capturing and transportation of animals whenever required.
- v. Liaising with Veterinary Section for health problems and treatment, and the Maintenance Section for repair and continuation of civic services.
- vi. Record keeping and inventories of different animals.

#### **2.4.2 Existing equipment**

At present, this section is equipped with all basic facilities like transport cages, hand trolleys, nets, ropes, pipes, squeeze cages and cleaning material.

#### **2.4.3 Existing staff**

Curator (Animals)/Forest Ranger– 1

Forester - 1

Animal Keepers – 2

Zoo Workers - 24

#### **2.4.4 Inventory of Animals**

The status of animal collection as on March 31, 2023, is given in **Annexure – 4**.

#### **2.4.5 Appraisal of existing animal enclosures**

The current state of the Animal Section in Sepahijala Zoological Park reflects substantial progress in line with the earlier situation. Notable achievements include the successful improvement towards naturalistic enclosures for various indigenous species. Enclosures for species such as for clouded leopard, primates, lesser Cats, reptile house, bird aviaries have undergone modifications to address shortcomings identified in the previous arrangement. The redesigning efforts aim to create enclosures that are fully compliant with the guidelines set by the Central Zoo Authority (CZA), ensuring the highest standards of animal welfare and management.

Scientific approaches to housing, health care, and education have significantly improved the well-being of the animals across the Zoo. However, specific enclosures, such as those housing Asiatic black bears, dog family members, civets,

herbivores, birds of prey, small birds, etc. have been identified as not meeting the CZA regulations. These enclosures are slated for demolition and complete reconstruction or modification to align with the stringent guidelines set by the CZA. The proposed changes emphasize the commitment to providing exemplary care and living conditions for these species, elevating the standards of ethical and responsible zoo management.

The Sepahijala Zoological Park also operates as a dedicated rescue and rehabilitation facility, embodying its commitment to the well-being of injured and orphaned animals. In the recent past, the Zoo has played a crucial role in providing nourishment and aftercare to numerous injured and rescued animals, including species such as python, crab-eating mongoose, wild cat, Indian jackal, small Indian civet, peacock-marked softshell turtle, Indian flap shellturtle, Himalayan Griffon vulture, black headed gull, and Asiatic black bear. Many of these animals have successfully undergone rehabilitation and few animals have been housed in off display enclosures for lifetime care, showcasing the organizations dedication to the welfare and conservation of diverse wildlife. Recognizing the increasing need for a specialized facility, the Zoo is actively working towards the establishment of a Rescue cum Rehabilitation Centre. This Centre shall serve as a crucial hub for offering immediate care and rehabilitation to injured or orphaned animals of various species.

#### **2.4.6 Constraints**

- i. Most of the animal enclosures do not conform to CZA standards
- ii. Most of the animal houses are without kraals and improper night cells.
- iii. Inadequate staff.

- iv. Infrastructure of old enclosures is in poor state.
- v. Sewage and drainage systems are not proper.
- vi. Chain link fences of most of the animal houses are rusted and broken at places.
- vii. Steel material rusted and corroded.
- viii. Inadequate equipment.

## **2.5 Veterinary Section:**

The Veterinary Section looks after the health care of zoo animals. There is one full-time veterinary doctor with the Zoological Park. The Section has well equipped veterinary hospital having operation theatre with basic facilities, in-patient wards, tranquilization equipment, small laboratory and post-mortem room.

The health care management, a pivotal aspect of our Zoo's operation, has undergone significant improvements. Notably, the construction of the veterinary hospital was successfully completed in the fiscal year 2008-09, establishing a foundation for comprehensive veterinary care within the facility. Plans are underway to further enhance the infrastructure to include diagnostic facilities, a vital component for advanced healthcare services. The veterinary hospital is equipped with essential features, including a dispensing room for outdoor patients, an inpatient ward with dedicated isolation ward, a pathological lab, an X-ray unit, an operation theatre, and a quarantine area. A neo-natal cum hand-rearing nursery has also been established to cater to the specific needs of our young inhabitants. To bolster the diagnostic capabilities, the hospital is furnished

with essential equipment such as microscopes, blood simmers, X-ray machines, and various laboratory apparatus.

The post-mortem room was constructed with funding from the Central Zoo Authority (CZA) in 2008-09, and all post-mortems are conducted in this room since its construction. As part of continuous improvement, a wood-based incinerator is currently under operation, further aligning with the high standards set by the CZA for the welfare of the animals under our care. This commitment to modern facilities and equipment underscores our dedication to providing top-notch veterinary care for the well-being of the Zoo's residents.

#### **2.5.1 Duties and responsibilities**

- Regular inspection of the Zoo animals and their treatment.
- Formulation of diet and quality control of feed issued to the Zoo animals.
- To follow prophylactic protocols, periodical examination of faecal matter, urine, blood etc.
- Periodic de-worming, vaccination and disinfection of animals.
- Planning breeding of endangered species and their husbandry.
- To take measures for preventive disease control in the Zoo.
- Physical and chemical capture of the Zoo and strayed animals.

#### **2.5.2 Existing equipment**

This section has two tranquilizing guns, operation table, surgical instruments and required medicines.

#### **2.5.3 Existing staff**

Existing staffing pattern under Veterinary Section:

Veterinary officer – 1

Veterinary Compounder – 1

Zoo Workers – 2

#### **2.5.4 Constraints:**

The Zoo staff actively engages in the rescue operations of various animals in wild, necessitating immediate attention to the procurement and maintenance of specialized medical equipment. These tools are essential for both physical and chemical capture and restraining of animals during rescue efforts. The urgency is further underscored by the need for a specialized rescue vehicle equipped with the necessary apparatus to ensure the safe and effective handling of animals during such operations. Addressing these pressing needs is crucial to maintaining the high standards of animal welfare and conservation efforts carried out by the Zoo staff during rescue missions and laboratory work.

Further, there is a need to upgrade the quarantine facility by creating section wise (carnivore, herbivore, reptiles & amphibian and avian) infrastructure which is proposed during the proposed phase of Master Plan.

#### **2.6 Commissary Section**

The Commissary Section, currently functioning through a food committee led by a Forester, alongside a Forest Guard, Vet Assistant, and four number Zoo Workers, has undergone notable improvements. Tender processes for animal food and daily necessities are managed by the Conservator of Forests, Southern Circle.

Daily or weekly deliveries of required food items are received from the contractor, adhering to proper challan procedures. The prescribed food schedule

is followed in the preparation of food items, which is then supplied to the Animal Sections on a daily basis. To enhance efficiency, the existing godown has been modernized with improved facilities. The godown premises now include an office room for the storekeeper cum in-charge of the food committee, facilitating record-keeping and overall management. A refrigerator has been provided for the storage of fresh fruits and vegetables. The kitchen has been upgraded, utilizing gas for cooking purposes, and an electronic digital weighing machine has been introduced for precise measurements.

Quality control measures have been implemented, including the introduction of a lactometer for checking the quality of supplied milk. Additionally, the collection of fodder for herbivores is now streamlined through this Section. The delivery of food articles to the Animal Section is efficiently managed through challans, and a dedicated delivery van has been arranged for the supply of food to each beat, replacing the previous practice.

To address environmental concerns, efforts have been initiated to shift from collecting green leaf/ fodder from nearby forests to the procurement of silage fodder. The Zoo is actively involved in developing fodder plantations for emergency needs, contributing to the conservation of both Zoo animals and Sanctuary habitats.

### **2.6.1 Existing staff**

Forester – 1

Forest Guard - 1

Zoo Workers – 4

### **2.6.2 Daily Feed Requirement**

The food is received as of daily requirement. Veterinary Officer on regular basis checks the quality of the diet supplied.

### **2.6.3 Constraints**

- i. Inadequate space to store food ingredients and fodder.
- ii. Inadequate staff.
- iii. There is no platform to load and unload material.
- iv. There is no *kutti* machine.

## **2.7 Maintenance Section**

This Section is responsible for the maintenance of animals' enclosures, roads and pathways, repair works, plumbing, electrical, carpentry and masonry works, etc. The Maintenance Section stands as a key entity responsible for the uninterrupted operation of diverse infrastructure elements within the Zoo. With a primary focus on maintaining the infrastructure and ensuring security, the team dedicates its efforts to upgrading essential facilities. Ongoing enhancements significantly contribute to the overall maintenance and efficiency of the Zoo's operations, ensuring a secure and well-functioning environment for both visitors and residents.

### **2.7.1 Duty and responsibilities**

- i. Construction of buildings, animal enclosures, roads, footpaths, and service lines.
- ii. Maintenance of all buildings, animal enclosures, service lines etc.
- iii. Repair and strengthening of steel sections, doors, partitions, up slides etc.

- iv. Lubrication of sliding/partition/gates/doors/pulleys/pressure pumps, etc. to ensure their proper functioning.
- v. Dewatering of moats/ponds/wallow pools/water bodies, as and when required.
- vi. Repair pressure pumps/heaters/coolers and other miscellaneous equipment and to keep these functional.
- vii. Replacement of damaged steel wire ropes of up-slide partitions/ gates of animal enclosures.

### **2.7.2 Existing staff**

Forester – 1

Pump Operator –1

Electrician – 1

Zoo Worker - 2

### **2.8 Sanitation Section:**

The Sanitation Section, crucial for upholding cleanliness and hygiene standards within the Zoo, assumes a pivotal role. Ongoing efforts to elevate waste disposal practices, incorporating the use of gas for cooking, introducing electronic weighing machines, and exploring local silage fodder production, underscore the commitment to modern sanitation standards.

It's noteworthy that while sanitation efforts cover various aspects, there is currently no dedicated Section specifically assigned for the cleaning of roads and internal Zoo areas. Nevertheless, a dedicated team of 8number Zoo Workers is employed under supervision of one Forest Guard, who in turn report to the

concerned Forester. Whenever necessary, additional workers are engaged to ensure comprehensive sanitation coverage. These initiatives collectively contribute to maintaining a clean and hygienic environment for both visitors and the Zoo inhabitants, aligning with contemporary sanitation best practices.

### **2.8.1 Duties and responsibilities**

- i. Cleaning of roads and footpaths.
- ii. Removal and disposal of garbage, leftover food, and animals waste, bones, fallen leaves, cut grasses, weeds, tobacco pouches and plastic items.
- iii. Regular cleaning of drinking water points, water coolers and tanks.

## **2.9 Horticulture Sections**

The Zoo's landscape, characterized by hilly terrain and abundant natural vegetation, has been enhanced by the creation of numerous gardens and lawns in the Zoological Park. Around the perimeters of animal enclosures, evergreen hedges have been strategically planted to provide greenery and camouflage concrete structures. The Zoo has also introduced a variety of plants, contributing to the overall biodiversity within the premises.

### **2.9.1 Duties and responsibilities**

- iv. To maintain lawns, trees, hedges and plants.
- v. To remove weeds from lawns and hedges, etc.
- vi. To provide water to lawns and trees.
- vii. To remove and collect dry leaves, etc. from lawns.
- viii. To remove uprooted / dead trees whenever occasion arises.

### **2.9.2 Existing equipment**

This Section has lawn mowers, grass cutter machines, water pipes, water pumps, trolleys and brooms etc.

### **2.9.3 Existing staff**

To ensure the upkeep of these green spaces, 8 Gardeners/Zoo Workers have been engaged for the purpose. Their responsibilities are overseen by one Forester through one Forest Guard.

### **2.9.4 Constraints**

There is an opportunity for the Zoo to identify additional land areas suitable for conversion into landscape gardens. Emphasizing the use of indigenous species in these gardens and lawns is essential. Furthermore, the establishment of a small glass house or poly house and a plant nursery is imperative for germinating flowering plants and hedges, among other botanical elements. This will contribute to the ongoing enhancement of the Zoo's overall landscaping efforts.

### **2.10 Security Section:**

The Zoo is enclosed by a 2-meter-high chain link fence along the periphery aligning with the guidelines set by the Central Zoo Authority. Given its proximity to a surrounding forest, it is crucial to safeguard the Zoo from potential ingress by wild animals, particularly leopards/clouded leopards from the nearby forest, as well as from unauthorized intruders or thieves, given the human habitation in the vicinity. Security stands as a critical aspect of zoo management.

Recent incidents of thefts in some recognized zoos in India have underscored the need for heightened security measures. Additionally, the successful busting of

several wildlife smuggling operations emphasizes the existence of a significant illegal demand for wild animals. The security system is strategically organized to ensure a continuous vigil on duty round the clock basis.

### **2.10.1 Duties and responsibilities**

- To patrol the Zoo area day & night.
- To protect the Zoo property, animals and visitors.
- To check illicit cutting of trees.
- To maintain law and order at entrance and inside the Zoo area.
- To assist public in lost & found.
- To interact with local police whenever needed.
- To control vandalism, pick pocketing and teasing of animals.
- To frisk visitors at entry point whenever required.
- To man service & entry gates.

### **2.10.2 Existing Arrangement**

Forester-1

Forest Guard/Gate Keeper-4

Security Personnel/Zoo Worker-12

### **2.10.3 Constraints:**

There is an immediate requirement to augment the number of security personnel and appoint a well-qualified, experienced Security Supervisor capable of overseeing the security staff, whether on a regular or outsourced basis. A heightened focus on vigilance for the security of zoo animals and property is imperative. Additionally, periodic training sessions for the security staff are

essential to keep them abreast of the latest technologies, enabling them to integrate these advancements into their day-to-day surveillance for optimal outcomes.

### **2.11 Education Section**

This is a very important component of zoo management. The visitors after their visit go back with empathy for wild animals in captivity and also in the wild, besides getting information about different aspects of Biology and Ecology of the wild animals. Hence, the proper steps need to be taken up in years to come. School groups are brought at the Sanctuary and the Zoo for the whole day and are explained various ongoing activities in the Zoo and Sanctuary and the need for keeping the animals in the captivity and to take up conservation breeding programme in the Zoo. This is being done on regular basis.

As such no separate Section is maintained by name of Education Section in the Zoo. Display boards in front of the animal enclosures containing the brief description of the particular species are put. Major events like Vanamotshava, Environment day, Wildlife Week are celebrated which are also part of education awareness programme in the Sanctuary. Informative leaflets are published to convey conservation messages to the young generation

### **2.12 Research Section**

Zoo Biologist at Sepahijala Zoological Park is actively engaged in collecting comprehensive information on the Conservation Breeding Programme (CBP) for the spectacle langur, clouded leopard, binturong, and pig-tailed macaque. The data collected includes crucial insights into the reproductive biology, behaviour,

and genetics of these species, which will be instrumental in the success of the breeding program.

Furthermore, the Zoo is gearing up to publish the findings from these studies, contributing valuable scientific knowledge to the field of wildlife conservation. These publications will not only document the progress and success of the CBP at Sepahijala Zoo but will also serve as a valuable resource for researchers, conservationists, and wildlife enthusiasts globally.

In tandem with the breeding program, the Zoo is actively involved in scientific studies and research on various aspects of animal welfare and conservation. Ongoing research covers animal behaviour, nutrition, reproduction, and disease. This multidisciplinary approach ensures a holistic understanding of the needs and challenges faced by the targeted species, facilitating more informed decision-making in their management.

The commitment to scientific study and research underscores the Zoo's dedication to the welfare of the animals under their care and its broader mission of contributing to the body of knowledge that guides conservation efforts. By continuously expanding our understanding of these species, Sepahijala Zoological Park aims not only to successfully breed and conserve them but also to contribute valuable insights that can benefit the broader field of wildlife conservation.

### **2.13 Conservation Breeding:**

The undertaking of a Conservation Breeding Programme (CBP) for the identified species at Sepahijala Zoological Park underscores the critical importance of proactive conservation measures in the face of increasing threats to wild

populations. Conservation breeding plays a pivotal role in preserving and potentially restoring populations of endangered or vulnerable species that face various challenges such as habitat loss, poaching, and declining numbers in the wild.

The spectacle langur, clouded leopard, binturong, and pig-tailed macaque are the species of significant ecological importance, contributing to the biodiversity of their respective ecosystems. By implementing a CBP, Sepahijala Zoo is actively contributing to the conservation of these species, serving as a safeguard against the risk of extinction. Breeding programs offer a controlled environment where factors such as habitat destruction, human-wildlife conflict, and diseases can be minimized, providing a safe haven for the species to thrive.

Furthermore, CBPs contribute valuable data and insights into the reproductive biology, behaviour, and genetics of these species. This knowledge is not only essential for the successful breeding and management of captive populations but also aids in formulating effective conservation strategies for their wild counterparts. The information gathered through breeding programs shall help in habitat restoration efforts, anti-poaching initiatives, and other on-the-ground conservation activities.

In addition to their ecological significance, these species also hold cultural and aesthetic value, serving as flagship species that capture public attention and support for broader conservation initiatives. Successful breeding programs can generate public awareness and engagement, fostering a sense of responsibility and commitment to wildlife conservation among local communities and beyond.

The financial support from the Central Zoo Authority further emphasizes the collaborative efforts required for successful conservation. By allocating funds for the construction of dedicated CB enclosures, the CZA demonstrates its commitment to promote sustainable conservation practices and ensuring the well-being of these species.

In conclusion, the Conservation Breeding Programme at Sepahijala Zoological Park not only addresses the immediate threats faced by these species, but also contributes to the broader goals of biodiversity conservation, scientific research, and community awareness. Through strategic and collaborative efforts, such programs play a crucial role in securing a future for these species and maintaining the delicate balance of our planet's ecosystems.

#### **2.14 Population Management & Control of Spotted Deer Population:**

At present there are more than 300 spotted deer in the Zoo. The excessive population growth of spotted deer is to be controlled. Already certain measures have been taken to control birth of spotted deer which need to be continued. In this process, we have made several compartments and segregated male and female spotted deer in these compartments and by this process new birth rate has been controlled. Several more compartments need to be made to thin the segregated population and the process would be continued so long it is required.

The matter of shifting maximum numbers of spotted deer in other forest areas in the state has been taken up at appropriate level for which details field level survey is on and hopefully, the Zoo will be able to reduce the existing huge population by way of shifting a good number of spotted deer in the wild with the approval of State Wildlife Board.

## **2.15 Water Supply Network**

The Water Supply plays a vital role in ensuring the well-being of the Zoo's residents. Ongoing efforts to improve water facilities, shelters, and overall infrastructure contribute significantly to the health and comfort of the animals. Additionally, syntax tanks, each with a water-holding capacity of 1000litters, have been strategically installed to meet the daily requirements for drinking, cleaning, and irrigating flower beds.

The water is sourced through underground pipelines employing gravity, extending to all existing enclosures and designated drinking water points for the convenience of visitors. It is important to highlight that the water supply system is managed by two pumps, operated by a skilled pump operator and an assistant. Their expertise ensures the efficient distribution of water throughout the Zoo, catering to the diverse needs of both the animal inhabitants and visiting patrons.

### **2.15.1 Constraints:**

The current water infrastructure at the Zoo, while effective for present needs, is anticipated to face challenges in meeting the escalating water demands expected in the future. As the Zoo expands and evolves, accommodating new exhibits, enclosures, and potentially more visitors, there is a pressing need to augment the existing water sources and associated infrastructure.

This constraint underscores the importance of strategic planning and investment in expanding water sources, upgrading pipelines, and enhancing storage capacities to meet the evolving needs of the Zoo. Failure to address this constraint could potentially compromise the well-being of the animals and the

overall functionality of the Zoo. Therefore, a comprehensive augmentation of water resources is imperative to sustain the Zoo's growth and maintain the high standards of care and services it strives to provide.

### **2.16 Disposal of Solid Waste & Liquid Waste-Sewerage:**

Daily waste management is a crucial aspect of zoo operations. Solid wastes generated from enclosures, night houses, and various areas within the Zoo are collected on a daily basis and responsibly disposed of in a designated pit located away from animal enclosures, near the post-mortem house. A wood-based incinerator, positioned near the Veterinary Hospital, is also dealing with disposal of medical waste. The liquid waste is efficiently managed through a well-established drainage system, ensuring the proper disposal of animal sewerage. Currently, the liquid waste from night houses is directed into the common sewage system. Additionally, sanitation personnel attend to the daily waste generated by visitors, maintaining a clean and hygienic environment.

#### **2.16.1 Constraints:**

There exists a need to refine the sewage management process for night houses. The current proposal suggests collecting sewage from various night houses, subjecting it to disinfection through appropriate chemical processes, and directing it into a central pool for responsible disposal. This upgrade aims to enhance waste treatment efficiency. Furthermore, there is a potential opportunity to repurpose the treated sewage as a nutritional supplement in the Zoo's fodder plot, aligning with sustainable and eco-friendly waste management practices. Addressing these constraints will contribute to the overall improvement of the Zoo's waste disposal system, ensuring both environmental responsibility and resource optimization.

### **2.17 Polythene-Free and No Smoking Zone**

In adherence to environmental sustainability practices, the Zoo has been designated as a polythene-free and no-smoking zone. For promoting a cleaner and healthier environment, signboards indicating these regulations have been prominently placed throughout the premises, ensuring clear communication to all visitors.

To actively discourage the use of polythene, strategically located dust bins have been provided at various points within the Zoo. These bins are specifically designed for proper waste disposal, allowing visitors to responsibly dispose of any waste they may have. The integration of these dust bins not only promotes a polythene-free environment, but also encourages visitors to participate in maintaining the cleanliness and eco-friendliness of the zoo.

### **2.18 Visitors Amenities:**

The Zoo has successfully transformed its amenities and facilities to create a pleasant and less tiring experience for visitors. Good number of public washrooms and rain shelters have been strategically positioned for visitors. A canteen is available near parking zone and a cloakroom is provided for the convenience of visitors. Ramps have been thoughtfully constructed to facilitate access for Divyangjan individuals at various animal viewing areas, with a supply of wheelchairs for their ease of movement.

First aid kits, stock of anti-venom and other life-saving drugs, are readily available for visitors and Zoo staff. The provision of guide maps and information brochures enhances the overall visitor experience. The education/interpretation

facilities offer valuable insights into nature, the environment, and wildlife. Furthermore, a small library stocked with intriguing wildlife editions and a souvenir shop contribute to the enriching experience of visitors.

Despite these accomplishments, certain constraints persist. The sloped terrain remains a challenge, and the absence of visitor vehicles facilities requires immediate attention for development. Efforts are underway to address the lack of public announcement systems and fire alarms to ensure efficient management during emergencies. The ongoing construction of ramps in all enclosures is a testament to the commitment to ensuring accessibility for individuals with disabilities.

The parking facilities have been optimized, with designated areas for all categories of vehicles outside the Zoo boundary. Drinking water facilities have been strategically placed near the entrance gate, the primate section, and other places. Plans are in place for the construction of public toilets near the lion enclosure, with ramp provisions for physically handicapped persons. The existing food canteen has been improved for better visitor facilities, and a Sulabh toilet facility is being developed near the canteen.

Wheelchairs are now arranged at the main gate for on-demand use by invalid persons at a nominal charge. Rest sheds at different locations are being maintained to provide visitors with a comfortable break during their visit. Plans are underway for a telephone booth at the main entrance gate for visitor convenience. Information boards and necessary warnings are displayed as needed.

Efforts have been made to involve local youths through the eco-development committees for the provision of guides, with proper training. Outstanding visitors are now rewarded annually, with a dedicated zoo evaluation team formed for this purpose. Regular visitor surveys are conducted to identify and provide additional amenities and facilities. Transportation facilities for visitors from the 1st gate to the zoo have been appropriately arranged.

Circulation paths for visitors within the Zoo have been redesigned as per the approved Master Plan, reducing visitor congestion at specific locations. Trained staff now address school groups to disseminate appropriate conservation messages. Facilities have been established for visitors to keep their belongings in the cloak room near the entry gate for a nominal charge. During peak visitor hours, security personnel make circuits inside the zoo to ensure visitor safety, with the possibility of opening more counters on peak visiting days.

The staff and workers residing inside the zoo have been trained to be friendly and provide visitors with the required information and assistance, ensuring a pleasant and enjoyable visit. The zoo's commitment to continuous improvement and visitor satisfaction remains a top priority.

#### **2.18.1 Constraints:**

The terrain is slopy, and visitor vehicle facilities are not yet available. This is an area that requires attention and development. Moreover, there is a need to address the absence of public announcement systems and fire alarms to efficiently manage visitors during emergency situations. Constructing ramps in

viewing areas of all enclosures is also necessary to ensure ease of access for individuals with disabilities.

### **2.19 Staff accommodation:**

Staff are staying about 0.5 km away from the Zoo which is also not sufficient for accommodation of all staff. For accommodation of Curator, Vet doctor and other staff construction of some more quarters is required.

### **2.20 Mobility:**

At present one Tata Specio Gold (From JICA Project) and a commander jeep is positioned for movement by the Director and the other Zoo officials.

### **2.21 Other Unique Feature:**

Sepahijala Zoo is located in the vicinity of Sepahijala Wildlife Sanctuary and has intimate connection with the Sanctuary, having a harmonious blend of diverse flora and fauna, elevating its status as a biodiversity haven in the state of Tripura. Encompassing a vast expanse of 18.53 km<sup>2</sup>, the Sepahijala Wildlife Sanctuary offers a flourishing habitat for a myriad of species, enveloping visitors in an unparalleled experience amidst verdant landscapes. The integration of the Zoo within this sanctuary not only amplifies its allure but also ensures a distinctive and immersive wildlife encounter for all visitors.

## **PART - 2**

### **Chapter 3**

#### **3.1 Future Objectives - Advancing Towards a Decade of Excellence**

Embarking on a visionary journey, the Sepahijala Zoological Park shall be redeveloped as Sepahijala Zoological Park and Safari in an area of 94.90 hectares (from existing 68.04 hectares) and aspires to redefine itself as an eminent organization dedicated to conservation of wild fauna, education and outreach, and research. A cornerstone of our forthcoming decade is the pivotal role our breeding program will play in safeguarding endangered species. Our commitment extends beyond showcasing these species; we aim to actively contribute to the rejuvenation and enrichment of the biological fabric within the forests of Tripura, Northeast of India.

#### **3.2 Vision**

A world where wild animals are valued, and their conservation assured. The Zoo envisions standing as a beacon of excellence in wildlife conservation, breeding, education and research and rescue and rehabilitation. Our ambition is to make substantial contributions to safeguarding and preserving global biodiversity.

#### **3.3 Mission Statement:**

1. **Conservation:** Our mission is to champion the conservation and breeding of endangered and rare fauna, with a specific focus on the primates of Tripura, clouded leopard, and binturong, aiming to revitalize essential

biological attributes and enhance diversity in the forests of Tripura, North East and of India.

2. **Research:** We are committed to developing a comprehensive database on the behaviour, breeding, population dynamics, and veterinary care of animals. Our scientific studies will delve into animal behaviour, nutrition, reproduction, and diseases.
3. **Education:** Illuminating the public about the faunal richness of the State, the Region and the Country, we aim to garner their support for biodiversity conservation. We seek to develop eco-tourism potential for the people of the State.
4. **Awareness:** Engaging in wildlife education and interpretation, we strive to communicate conservation values, fostering a deeper understanding and appreciation of wildlife and its role in the ecosystem.
5. **Captive Breeding:** We view captive breeding as a cornerstone for display, exchange with other zoos, and rehabilitation of endangered and threatened species. Emphasizing the significance of breeding programs, we recognize their pivotal role in ensuring the survival and sustainability of these species.
6. **Coordinated Conservation Breeding:** Playing a pivotal role in coordinated conservation breeding programs, we actively participate in flagship initiatives for clouded leopard, binturong, pig-tailed monkey, Phayre's leaf monkey, and hoolock gibbon.

### **3.4 Theme**

Theming is a cornerstone of our transformative vision at the Sepahijala Zoological Park and Safari. Departing from haphazard housing of animals, our thematic approach facilitates systematic communication of the importance of wildlife and conservation. With the endorsement of the Central Zoo Authority's thematic Master (Layout) Plan, our Zoo has evolved from a recreational focus to a centre for education and wildlife conservation.

Our Zoo shall be redefined, transitioning from mere recreation to education, underpinned by the propagation of awareness in wildlife conservation through education and interpretation. The strategic incorporation of themed exhibits aligning seamlessly with these objectives, the Zoo envisions a future divided into zones, dedicated to mammals, birds, reptiles, fishes, and a mixed species safari. This meticulous zoning ensures a coherent and educational visitor experience, fostering awareness of scientific affinities, ecological values, and habitats through exhibits that illustrate the intricate interplay of nature.

In future endeavours, the Zoo commits to working diligently to develop enclosures in accordance with the approved Master (Layout) Plan, thereby realizing a thematic view that eloquently conveys the message of wildlife conservation. While constraints imposed by the limited available area necessitate the retention of some existing structures, the extension area of the Zoo will be strategically utilized for the reconstruction of remaining enclosures. This approach reflects the Zoo's unwavering commitment to its mission and vision, ensuring a profound and impactful message of wildlife conservation.

### 3.5 Strategy

Our strategic approach revolves around the conservation of endemic fauna of north-eastern India through captive breeding and naturalistic enclosure designs based on scientific principles. The Zoo also displays a few exotic animals to meet visitor expectations while actively participating in exchange programs with other zoos. The key strategies include:

1. **Thematic Enclosures:** Designing and developing enclosures according to the approved Master (Layout) Plan, following a thematic approach that highlights scientific affinities, ecological values, and habitats for the animals housed.
2. **Conservation Breeding:** Actively participating in conservation breeding programs for identified species, coordinating with other zoos to ensure genetic diversity and long-term viability. Highlighting the importance of breeding programs as a proactive measure for species preservation.
3. **Educational Activities:** Strengthening and expanding education programs targeting different age groups, schools, general public and decision makers. Upgrading signages for all enclosures to provide behavioural and biological information about the species housed.
4. **Research Initiatives:** Establishing a dedicated research section to conduct scientific studies, gather behavioural data, and contribute to wildlife research. Dedicated Biologist for research activities and Conservation Breeding Programme.
5. **Infrastructure Upgrade:** Re-development & modification of existing enclosures to naturalistic enclosure, enhancing veterinary facilities,

supporting animal health care, and upgrading infrastructural of hospital unit and quarantine facilities. Installing a pathological laboratory, X-ray unit, and operation theatre for comprehensive animal care and international standards interpretation facility etc.

6. **Visitor Amenities:** Improving visitor amenities, including resting sheds, drinking water points, toilets, and kiosks, to enhance the overall experience.
7. **Community Engagement:** Engaging with local communities for increased awareness, support, and participation in wildlife conservation efforts. Developing outreach programs to extend the Zoo's impact beyond its boundaries.
8. **Legal Compliance:** Adhering to all wildlife laws, regulations, and policies, ensuring ethical and legal practices in animal management and conservation.

By aligning these strategies with the overarching vision and mission, Sepahijala Zoological Park and Safari aims to create a lasting impact on wildlife conservation and education in the region. The breeding program stands out as a pivotal element in this pursuit, contributing significantly to the conservation objectives and ensuring the continued existence of endangered species.

### **3.6 Objectives**

The objective of the Zoo is in line with the National Zoo Policy, 1998, which includes providing safe, secure and near natural housing facility to the Zoo inhabitants. Further, to aware the visitors and stakeholders about the importance of nature conservation through education, breeding of endangered animal

species to act insurance population through research and to act as rescue and rehabilitation centre.

- The main objective of the Zoo shall be to complement and strengthen the national efforts in conservation of the rich biodiversity of the country, particularly the wild fauna.
- The Zoo shall support the conservation of endangered species through coordinated breeding under *ex-situ* condition and raise stocks for rehabilitating them in wild as and when it is appropriate and desirable, linking *ex-situ* & *in-situ* conservation of wild fauna.
- To educate and aware zoo visitors about the need of conservation of nature and natural resources and to share the knowledge the importance of wild fauna and flora in maintaining the ecological balance. Also, to sensitise the Zoo visitors, general public and stakeholders about adoption of sustainable lifestyle in their day-to-day activities.
- Providing opportunities for scientific studies useful for conservation in general and creation of database for sharing between the agencies involved in *in-situ* and *ex-situ* conservation and to State and Central Government.
- The Zoo shall also upgrade its infrastructure to continue to function as rescue centres for orphaned/ injured/ seized/ rescued/ sick/ conflicted wild animals. The recovered animals shall be released in natural habitat as soon as possible following scientific guidelines in this regard.

### **3.7 Enriching Biodiversity: A strategic expansion of the Zoo's animal collection**

In the pursuit of its noble mission to stand as a paramount institution for wildlife conservation, breeding, education and outreach, and research, Sepahijala Zoological Park and Safari envisages a strategic expansion of its existing animal collection. This visionary endeavour aims not merely at augmenting the variety of species on display but forms an integral part of the Zoo's holistic approach towards conservation, breeding, and public awareness.

#### **3.7.1 Mammals: A symphony of diversity**

The proposed inclusion of majestic species such as tigers, Asiatic lions, and common leopards resonates deeply with the Zoo's commitment to conservation. By hosting breeding programs for these iconic big cats, the Zoo becomes a proactive participant in preserving endangered species. The addition of clouded leopard, Asiatic golden cat, fishing cat and binturong further extends the Zoo's influence, contributing to the conservation landscape. Additionally, the inclusion of various primates, such as the spectacled langur, pig-tailed macaque, hoolock gibbon and Assamese macaque enhances the Zoo's role in primate conservation, fostering genetic diversity and ensuring the survival of these intelligent beings.

#### **3.7.2 Avian haven: A kaleidoscope of plumage**

In the avian realm, the Zoo's expansion reaches new heights with the inclusion of an array of pheasants, from the grey peacock pheasant to the Blyth's pheasant to different hornbills, North East India is home to. This carefully curated assortment serves as a living testament to the Zoo's dedication to avian conservation, providing an educational canvas on which visitors can appreciate the diversity and beauty of our feathered counterparts. Birds of prey, such as the crested serpent

eagle and Eurasian eagle owl, find a sanctuary within the Zoo, furthering its commitment to avian conservation and education.

### **3.7.3 Reptiles and aquatic ecosystems: Beneath the scales**

Diving into the realms of reptiles, the addition of diverse species, including crocodiles, pythons, and turtles, adds a layer of intrigue and educational value. Often misunderstood and underappreciated, these reptiles play crucial roles in maintaining ecological balance. The inclusion of various fish species contributes to the Zoo's efforts in raising awareness about freshwater ecosystems and the need for their conservation.

### **3.7.4 Educational and engaging: Meerkats and sugar gliders**

Beyond conservation efforts, the Zoo acknowledges the importance of providing an engaging and educational experience for its visitors. Enter the world of meerkats and sugar gliders – charming and captivating creatures that not only entertain but also serve as ambassadors for their ecosystems. Their inclusion aligns seamlessly with the Zoo's commitment to fostering a deeper understanding and appreciation of wildlife.

In conclusion, the proposed expansion of the Sepahijala Zoological Park and Safari's animal collection transcends not the mere addition of species, it symbolizes a strategic commitment to wildlife conservation, breeding programs, and public education. By creating a harmonious tapestry of diverse species, the Zoo aims to not only enrich biodiversity within its confines but also inspire a collective responsibility for the preservation of our planet's rich and varied fauna. This ambitious undertaking reflects the Zoo's unwavering dedication to its mission and vision, ensuring a profound and impactful message of wildlife conservation for generations to come.

## Chapter – 4

### 4.1 Future Planning

Aim of the Future Plan is to provide suggestions for redevelopment of Sepahijala Zoological Park (68.04 hectares) as Sepahijala Zoological Park and Safari at the same location with extended area (94.90 hectares) for next 20 years (from 2023-24 to 2043-44). The Master Plan is not a final blueprint and is subject to certain changes as per the advancement of time and requirements, with the provision to review every 10 years. Proposal is based on available resources and for convenience of the management. The Plan has been prepared based on the site requirements, visitors' profile, availability of water, electricity, vegetation, climatic conditions and resources available with the management. While formulating the proposal, recommendations and guidelines of the Central Zoo Authority have been taken into consideration. The guidelines of the Central Zoo Authority, advice from zoos and *ex-situ* conservation experts and wild lifers have been taken into consideration in the formulation of action plan. The concerns expressed by the Central Zoo Authority during evaluation of Sepahijala Zoological Park from time to time have also been kept in view while formulating the proposals for new structures and activities. The re-development has been planned to keep in view the strategy to achieve the prescribed objectives.

The Master Plan, building upon the successes of its predecessor, is poised to carry the Sepahijala Zoological Park into the future. Emphasizing the core values of conservation, education, and animal welfare, the new Plan aligns with the Zoo's mission to conserve and breed endangered species, generate empathy, and create awareness among the masses. The focus on natural surroundings,

exhibition of animals in excellent conditions, and conservation breeding programs for specific species demonstrates a commitment to holistic zoo management.

Moving forward, the Master Plan envisions a comprehensive and phased implementation of the proposed modifications and reconstruction projects. The approval of the Master Plan by the CZA will mark the initiation of these strategic efforts to bring all enclosures, including those undergoing modification or reconstruction, into full compliance with CZA standards. This proactive approach underscores the Zoo's dedication to upholding the highest levels of animal care, conservation, and education at Sepahijala Zoological Park and Safari.

#### **4.2 Animal Collection Plan**

Sepahijala Zoological Park and Safari aims to display various animals keeping in view the local ecological conditions, habitat, climate and the resources available. The Park & Safari is going to be a modern zoo and shall mainly display animals and biodiversity of north-eastern India of which the state of Tripura is part of. Sepahijala Zoological Park and Safari shall be in an area of 94.90 hectares.

##### **4.2.1 Inventory of Animals**

Considering all the above factors and inventory of animals (as on 30<sup>th</sup> November 2023) in the collection in Sepahijala Zoological Park presently, following wild animal species have been identified for display in Sepahijala Zoological Park and Safari. Animals as per proposed Animal Collection Plan (existing animal species and their numbers as given against each species) shall be procured in exchange (of surplus animals in stock as per the proposed animal collection plan) or as gifts from different zoos in India and abroad.

## Animal Collection Plan, Sepahijala Zoological Park and Safari

Animal Collection Plan, Sepahijala Zoological Park and Safari, Tripura										
Name of species		Present existing stock (as on 30.09.23)				Proposed Collection				Remarks
		M	F	U	T	M	F	U	T	
<b>MAMMALS:</b>										
1	Tiger ( <i>Panthera tigris</i> )	0	0	0	0	2	3	0	5	
2	Asiatic lion ( <i>Panthera leo persica</i> )	7	2	0	9	2	3	0	5	
3	Common leopard ( <i>Panthera pardus</i> )	0	1	0	1	2	3	0	5	
4	Clouded leopard ( <i>Neofelis nebulosa</i> )	2	0	0	2	2	3	0	5	Present stock & Proposed collection stock are for display only (excluding CBC specimens)
5	Leopard cat ( <i>Prionailurus bengalensis</i> )	7	8	6	21	4	6	0	10	
6	Asiatic golden cat ( <i>Catopuma temminckii</i> )	0	0	0	0	2	3	0	5	
7	Marbled cat ( <i>Pardofelis marmorata</i> )	0	0	0	0	2	3	0	5	
8	Jungle cat ( <i>Felis chaus</i> )	7	3	0	10	2	3	0	5	
9	Fishing cat ( <i>Prionailurus viverrinus</i> )	4	3	0	7	2	3	0	5	
10	Wolf ( <i>Carnis lupus</i> )	0	0	0	0	2	3	0	5	
11	Wild dog ( <i>Cuon alpinus</i> )	0	0	0	0	2	3	0	5	
12	Stripped hyena ( <i>Hyena hyena</i> )	0	0	0	0	2	3	0	5	
13	Jackal ( <i>Canis aureus</i> )	1	0	5	6	2	3	0	5	
14	Bengal fox ( <i>Vulpes bengalensis</i> )	0	0	0	0	2	3	0	5	
15	Binturong ( <i>Arctictis binturong</i> )	1	0	0	1	2	3	0	5	Present stock & Proposed collection stock are for display only (excluding CBC specimens)
16	Large Indian civet ( <i>Viverra zibetha</i> )	0	0	0	0	2	3	0	5	
17	Small Indian civet ( <i>Viverricula indica</i> )	1	1	0	2	2	3	0	5	
18	Masked palm civet ( <i>Paguma larvata</i> )	2	1	0	3	2	3	0	5	
19	Asian palm civet ( <i>Paradoxurus hermaphrodites</i> )	0	0	0	0	2	3	0	5	

20	Eurasian otter ( <i>Lutra lutra</i> )	0	0	0	0	2	3	0	5	
21	Himalayan black bear ( <i>Ursus thibetanus</i> )	6	16	0	22	2	3	0	5	
22	Sun Bear ( <i>Helarctos malayanus</i> )	0	0	0	0	2	3	0	5	
23	Hoolock gibbon ( <i>Hoolock hoolock</i> )	0	1	0	1	2	3	0	5	
24	Rhesus macaque ( <i>Macaca mulatta</i> )	3	3	4	10	3	5	0	8	
25	Assamese macaque ( <i>Macaca assamesensis</i> )	0	0	0	0	3	5	0	8	
26	Pig-tailed macaque ( <i>Macaca leonina</i> )	1	2	1	4	3	5	0	8	Present stock & Proposed collection stock are for display only (excluding CBC specimens)
27	Stump-tailed macaque ( <i>Macaca arctoides</i> )	0	0	0	0	3	5	0	8	
28	Spectacled langur ( <i>Trachypithecus phayrei</i> )	4	7	2	13	3	5	0	8	Present stock & Proposed collection stock are for display only (excluding CBC specimens)
29	Capped langur ( <i>Trachypithecus pileatus</i> )	3	1	0	4	3	5	0	8	
30	Grey langur ( <i>Presbytis entellus</i> )	0	0	0	0	3	5	0	8	
31	Gee's golden langur ( <i>Trachypithecus geei</i> )	0	0	0	0	3	5	0	8	
32	Hamadryas Baboon ( <i>Papio hamadryas</i> )	0	0	0	0	3	5	0	8	
33	Bengal slow loris ( <i>Nycticebus bengalensis</i> )	3	0	0	3	3	5	0	8	
34	Indian rhino ( <i>Rhinoceros unicornis</i> )	0	0	0	0	2	3	0	5	
35	Hippopotamus ( <i>Hippopotamus amphibious</i> )	1	1	0	2	2	3	0	5	
36	Gaur ( <i>Bos gaurus</i> )	0	0	0	0	6	10	0	16	Including Safari (3:5:0:8)
37	Sambar ( <i>Rusa unicolor</i> )	0	1	0	1	6	10	0	16	Including Safari (3:5:0:8)
38	Sangai ( <i>Rucervus eldii</i> )	0	0	0	0	6	10	0	16	Including Safari (3:5:0:8)

39	Chital ( <i>Axis axis</i> )	112	160	12	284	6	10	0	16	Including Safari (3:5:0:8)
40	Barking deer ( <i>Montiucus mutjak</i> )	0	0	0	0	6	10	0	16	Including Safari (3:5:0:8)
41	Hog deer ( <i>Axis porcinus</i> )	0	1	0	1	6	10	0	16	Including Safari (3:5:0:8)
42	Nilgai ( <i>Boselaphus tragocamelus</i> )	0	0	0	0	6	10	0	16	Including Safari (3:5:0:8)
43	Red serow ( <i>Capricornis rubidus</i> )	1	0	0	1	6	10	0	16	Including Safari (3:5:0:8)
44	Red goral ( <i>Naemorhedus baileyi</i> )	0	0	0	0	6	10	0	16	Including Safari (3:5:0:8)
45	Black buck ( <i>Antelope cervicarpa</i> )	7	7	2	16	6	10	0	16	Including Safari (3:5:0:8)
46	Indian Porcupine (( <i>Hystrix indicus</i> )	1	2	2	5	2	3	0	5	
47	Indian pangolin ( <i>Manis crassicaudata</i> )	0	0	0	0	2	3	0	5	
48	Indian wild boar ( <i>Sus scrofa</i> )	0	0	0	0	6	10	0	16	Including Safari (3:5:0:8)
49	Meerkat ( <i>Suricata suricatta</i> )	0	0	0	0	2	3	0	5	
50	Sugar glider ( <i>Petaurus breviceps</i> )	0	0	0	0	2	3	0	5	
51	Crab eating mongoose ( <i>Herpestes urva</i> )	0	1	0	1	2	3	0	5	
<b>BIRDS:</b>										
52	Grey peacock pheasant ( <i>Polyplectron bicalcaratum</i> )	0	0	0	0	3	5	0	8	
53	Humes's pheasant ( <i>Syrmaticus humiae</i> )	0	0	0	0	3	5	0	8	
54	Blyth's pheasant ( <i>Tragopan blythii</i> )	0	0	0	0	3	5	0	8	
55	Temminck pheasant ( <i>Tragopan temminckii</i> )	0	0	0	0	3	5	0	8	
56	Indian pea fowl ( <i>Pavo cristatus</i> )	1	0	0	1	3	5	0	8	
57	Red jungle fowl ( <i>Gallus gallus</i> )	1	3	0	4	3	5	0	8	
58	Kalij pheasant ( <i>Lophura leucomelana</i> )	0	0	0	0	3	5	0	8	
59	Golden pheasant ( <i>Chrysolophus pictus</i> )	0	0	0	0	2	4	0	6	

60	Silver pheasant ( <i>Lophura nycthemera</i> )	0	0	0	0	2	4	0	6	
61	Reeves pheasant ( <i>Syrnaticus reevesii</i> )	0	0	0	0	2	4	0	6	
62	Lady amherst's pheasant ( <i>Chrysolophus amherstiae</i> )	0	0	0	0	2	4	0	6	
63	Black francolin ( <i>Francolinus francolinus</i> )	0	0	0	0	2	4	0	6	
64	Common quail ( <i>Coturnix coturnix</i> )	0	0	0	0	2	4	0	6	
65	Great pied hornbill ( <i>Buceros bicornis</i> )	0	0	0	0	2	3	0	5	
66	Oriental pied hornbill ( <i>Anthracerus albirostris</i> )	1	1	0	2	2	3	0	5	
67	Rufous-necked hornbill ( <i>Aceros nipalensis</i> )	0	0	0	0	2	3	0	5	
68	Wreathed hornbill ( <i>Rhyticeros undulatus</i> )	0	0	0	0	2	3	0	5	
69	Rhinoceros hornbill ( <i>Buceros rhinoceros</i> )	0	0	0	0	2	3	0	5	
70	Griffon vulture ( <i>Gyps himalayasis</i> )	1	1	2	4	2	3	0	5	
71	Slender billed vulture ( <i>Gyps tenuirostris</i> )	0	0	0	0	2	3	0	5	
72	Indian white rumped vulture ( <i>Gyps benegalensis</i> )	3	0	0	3	2	3	0	5	
73	Indian long billed vulture ( <i>Gyps indicus</i> )	0	0	0	0	2	3	0	5	
74	Crested serpent eagle ( <i>Spilornis cheela</i> )	1	0	3	4	2	3	0	5	
75	Brahminy kite ( <i>Haliastur indus</i> )	0	0	4	4	2	3	0	5	
76	Black Kite ( <i>Milvus migrans</i> )	0	0	5	5	2	3	0	5	
77	Brown fish owl ( <i>Ketupa zeylonensis</i> )	0	0	0	0	2	3	0	5	
78	Barn owl ( <i>Tyto alba</i> )	0	0	0	0	2	3	0	5	
79	Greater adjutant stork ( <i>Leptoptilos dubius</i> )	0	0	0	0	2	3	0	5	
80	Lesser adjutant stork ( <i>Leptoptilos javanicus</i> )	0	1	0	0	2	3	0	5	
81	Asian openbill stork ( <i>Anastomus oscitans</i> )	0	0	0	0	2	3	0	5	
82	Painted stork ( <i>Mycteria leucocephala</i> )	0	0	0	0	2	3	0	5	
83	Great white pelican ( <i>Pelecanus onocrotalus</i> )	2	1	0	3	2	3	0	5	

84	Grey pelican ( <i>Pelecanus philippensis</i> )	0	0	0	0	2	3	0	5	
85	Indian pond heron ( <i>Ardeola grayii</i> )	1	1	2	4	2	3	0	5	
86	Indian cormorant ( <i>Phalacrocorax fuscicollis</i> )	0	0	0	0	2	3	0	5	
87	Great white egret ( <i>Ardea alba</i> )	0	0	0	0	2	3	0	5	
88	White winged wood duck ( <i>Asarconis scutalata</i> )	0	0	0	0	3	5	0	8	
89	Green imperial pigeon ( <i>Ducula aenea</i> )	0	0	1	1	3	5	0	8	
90	Yellow-footed green pigeon ( <i>Treron phoenicoptera</i> )	0	0	0	0	3	5	0	8	
91	Rose-ringed parakeet ( <i>Psittacula krameri</i> )	0	0	0	0	3	5	0	8	
92	Red breasted parakeet ( <i>Psittacula alexandri</i> )	0	0	0	0	3	5	0	8	
93	Blossom headed parakeet ( <i>Himalayapsitta roreata</i> )	0	0	0	0	3	5	0	8	
94	Alexandrine parakeet ( <i>Psittacula eupatria</i> )	0	0	0	0	3	5	0	8	
95	Cockatiel ( <i>Nymphicua hollandicus</i> )	0	0	0	0	3	5	0	8	
96	Rosy-faced lovebird ( <i>Agapornis roseicollis</i> )	0	0	0	0	3	5	0	8	
97	Blue and gold macaw ( <i>Ara ararauna</i> )	0	0	0	0	2	3	0	5	
98	Red and green macaw ( <i>Ara chloropterus</i> )	0	0	0	0	2	3	0	5	
99	Scarlet macaw ( <i>Ara macao</i> )	0	0	0	0	2	3	0	5	
100	Hyacinth macaw ( <i>Anodorhynchus hyacinthinus</i> )	0	0	0	0	2	3	0	5	
101	Lesser sulphur-crested cockatoo ( <i>Cacatua sulphurea</i> )	0	0	0	0	2	3	0	5	
102	Grey Parrot ( <i>Psittacus erithacus</i> )	0	0	0	0	2	3	0	5	
103	Ostrich ( <i>Strithio camelus</i> )	0	0	0	0	2	3	0	5	
104	Emu ( <i>Dromiceius novaehollandiae</i> )	1	0	0	1	2	3	0	5	
105	Common Hill Myna ( <i>Gracula religiosa</i> )	2	2	0	4	4	4	0	8	
106	Black headed ibis ( <i>Threskiornis melanocephalus</i> )	0	1	0	1	2	3	0	5	
107	Sun Conure ( <i>Aratinga</i> )	0	0	0	0	4	4	0	8	

	<i>solstitialis</i> )									
108	Grey parrot ( <i>Psittacus erithacus</i> )	0	0	0	0	3	3	0	6	
109	Mandarin duck ( <i>Aix galericulata</i> )	0	0	0	0	2	4	0	6	
110	Rainbow lorikeet ( <i>Trichoglossus moluccanus</i> )	0	0	0	0	4	4	0	8	
<b>REPTILES:</b>										
111	Marsh crocodile ( <i>Crocodilus palustris</i> )	2	0	0	2	2	3	0	5	
112	Bengal monitor lizard ( <i>Varanus bengalensis</i> )	1	0	0	1	2	3	0	5	
113	Asian water monitor ( <i>Varanus salvator</i> )	0	0	0	0	2	3	0	5	
114	Indian chameleon ( <i>Chamaeleon zeylanicus Laurentii</i> )	0	0	0	0	2	3	0	5	
115	Green iguana ( <i>Iguana iguana</i> )	0	0	0	0	4	6	0	10	
116	Spiny-tailed iguana ( <i>Spiny-Tailed Iguana</i> )	0	0	0	0	3	5	0	8	
117	King cobra ( <i>Ophiophagus Hannah</i> )	0	0	0	0	2	3	0	5	
118	Monocled cobra ( <i>Naja kaouthia</i> )	0	0	0	0	2	3	0	5	
119	Indian cobra ( <i>Naja naja</i> )	0	0	0	0	2	3	0	5	
120	Banded krait ( <i>Bungarus fasciatus</i> )	0	0	0	0	2	3	0	5	
121	Russell viper ( <i>Vipera russelli</i> )	0	0	0	0	2	3	0	5	
122	Burmese python ( <i>Python bivittatus</i> )	0	1	4	5	2	3	0	5	
123	Indian rock python ( <i>Python molurus</i> )	0	0	0	0	2	3	0	5	
124	Yellow anaconda ( <i>Eunectes notaeus</i> )	0	0	0	0	2	3	0	5	
125	Ball python ( <i>Python regius</i> )	0	0	0	0	2	3	0	5	
126	Green tree python ( <i>Morelia viridis</i> )	0	0	0	0	2	3	0	5	
127	Ornate flying snake ( <i>Chrysopelea ornate</i> )	0	0	0	0	2	3	0	5	
128	Asian vine snake ( <i>Ahaetulla prasina</i> )	0	0	0	0	2	3	0	5	
129	Common bronze-back ( <i>Dendrelaphis pictus</i> )	0	0	0	0	2	3	0	5	
130	Red-necked keelback	0	0	0	0	2	3	0	5	

	<i>(Rhabdophis subminiatus)</i>									
131	Checked Keelback <i>(Xenochropis piscator)</i>	0	0	0	0	2	3	0	5	
132	Oriental rat snake <i>(Ptyas mucosa)</i>	0	0	0	0	2	3	0	5	
133	Copper-headed trinket <i>(Coelognathus radiates)</i>	0	0	0	0	2	3	0	5	
134	Indian star tortoise <i>(Geochalone elegans)</i>	0	0	0	0	2	3	0	5	
135	Asian giant tortoise <i>(Manouria emys)</i>	0	0	0	0	2	3	0	5	
136	Elongated tortoise <i>(Indotestudo elongata)</i>	0	1	0	1	2	3	0	5	
137	Black soft-shell turtle <i>(Nilssonia nigricans)</i>	0	0	0	0	2	3	0	5	
138	Peacock soft-shell turtle <i>(Nilssnia hurum)</i>	0	1	0	1	2	3	0	5	
139	Indian flap-shell turtle <i>(Lissemys punctata)</i>	3	6	0	9	2	3	0	5	
140	Indian soft-shell turtle <i>(Nilssonia gangaticus)</i>	0	0	0	0	2	3	0	5	
141	Indian pond terrapin <i>(Melanochelys trijuga)</i>	0	0	0	0	2	3	0	5	
142	Indian roofed turtle <i>(Pangshura tecta)</i>	0	0	0	0	2	3	0	5	
143	Red-eared slider turtle <i>(Trachemys scripta)</i>	0	0	0	0	2	3	0	5	
144	Asian leaf turtle <i>(Cyclemys gemeli)</i>	0	1	0	1	2	3	0	5	
145	Ball Python <i>(Python regius)</i>	0	0	0	0	2	3	0	5	
<b>Fishes:</b>										
146	Assam danio <i>(Devario assamensis)</i>	0	0	0	0	5	10	0	15	
147	Bengal loach <i>(Botia dario)</i>	0	0	0	0	5	10	0	15	
148	Blue spotted hill trout <i>(Barilius bakeri)</i>	0	0	0	0	5	10	0	15	
149	Denisonbarb <i>(Sahyadria denisonni)</i>	0	0	0	0	5	10	0	15	
150	Drape finbarb <i>(Oreichthys crenuchydes)</i>	0	0	0	0	5	10	0	15	
151	Dwarf gourami <i>(Trichogaster lalius)</i>	0	0	0	0	5	10	0	15	
152	Frail gourami <i>(Ctenopsonobilis)</i>	0	0	0	0	5	10	0	15	
153	Indian hifin barb <i>(Oreichthys Cosuatis)</i>	0	0	0	0	5	10	0	15	

154	Leopard danio ( <i>Danio rerio</i> )	0	0	0	0	5	10	0	15	
155	Malabar danio ( <i>Devario malabaricus</i> )	0	0	0	0	5	10	0	15	
156	Zebra loach ( <i>Botia striata</i> )	0	0	0	0	5	10	0	15	
157	Odessa barb ( <i>Pethiapadomya</i> )	0	0	0	0	5	10	0	15	
158	Mascara barb ( <i>Dawkinsia assimilis</i> )	0	0	0	0	5	10	0	15	
159	Dwarf puffer fish ( <i>Carinotetraodon Travancoricus</i> )	0	0	0	0	5	10	0	15	
160	Goonch ( <i>Bagarius yarrelli</i> )									
161	Snake head fish ( <i>Channa sp.</i> )	0	0	0	0	5	10	0	15	
162	Freshwater eel ( <i>Anguillidae sp.</i> )	0	0	0	0	5	10	0	15	
163	Sting ray ( <i>Myliobatoidei sp.</i> )	0	0	0	0	5	10	0	15	
164	Red-bellied piranha ( <i>Pygocentrus nattereri</i> )	0	0	0	0	5	10	0	15	
165	Koi ( <i>Cyprinus carpio</i> )	0	0	0	0	5	10	0	15	
166	Discus ( <i>Symphysodon sp.</i> )	0	0	0	0	5	10	0	15	
167	Sebae clown fish ( <i>Amphiprion sebae</i> )	0	0	0	0	5	10	0	15	
168	Emperor angel fish ( <i>Pomacanthus imperator</i> )	0	0	0	0	5	10	0	15	
169	Koran Angel fish ( <i>Pomacanthus semicirculatus</i> )	0	0	0	0	5	10	0	15	
170	Sailfin tang ( <i>Zebrasoma veliferum</i> )	0	0	0	0	5	10	0	15	
171	Snowflake moray ( <i>Echidna nebulosa</i> )	0	0	0	0	5	10	0	15	
172	Leopard eel ( <i>Myrichthys sp.</i> )	0	0	0	0	5	10	0	15	
173	White-spotted bamboo shark ( <i>Chiloscyllium plagiosum</i> )	0	0	0	0	5	10	0	15	
174	Banded butterfly fish ( <i>Chaetodon striatus</i> )	0	0	0	0	5	10	0	15	
175	Pakistan Butterfly fish ( <i>Chaetodon collare</i> )	0	0	0	0	5	10	0	15	
176	Red lionfish ( <i>Pterois volitans</i> )	0	0	0	0	5	10	0	15	

#### 4.3 Justification of the Collection Plan

Sepahijala Zoological Park and Safariaims to display various animals keeping in view the local ecological conditions, habitat, climate and the resources available. The Park & Safari when complete shall fall under the category of a large zoo (national collection) as per the Central Zoo Authority's classification of zoos in India (area: 94.90 ha, expected no. of visitors: around 5 lakhs annually, proposed number of animal species to be displayed: 176, proposed number of animals to be displayed: around 1300, number of endangered species proposed for display:

above 100, expected number of animals of endangered species: around 600), having Animal Collection Plan as prescribed by CZA as mentioned below:

- Wild animal species of area/locality/ecosystem of the Zoological Park of which the Park & Safari is part of (Indian state of Tripura) around 30% of the total species displayed.
- Representative wild animal species of the region (of India) the Zoological Park is part of (North-East India) around 30% of the total species displayed.
- Representative wild animal species of the nation (India) which are comfortable in the climate of the Zoological Park and Safari around 20% of the total species displayed
- Exotic species around up to 20% of the total species displayed

#### **4.4 Thematic display of animals**

For the convenience of the Park management, 'broad taxonomical display' of animal species as per the Animal collection Plan is proposed to be adopted as far as feasible.

#### **4.5 Description of the Master (layout) Plan**

Sepahijala Zoological Park shall be redeveloped as Sepahijala Zoological Park and Safari on the same site with additional area. The site is located around 30 kilometres from the capital city of Agartala on Agartala-Udaipur Road (National Highway No. 208). The Park & Safari has been proposed to be developed on modern concept of zoo design and management. An area of 94.90 hectares has been identified for the purpose which is full of vegetation adjoining Sepahijala Wildlife Sanctuary and Clouded Leopard National Park, Tripura. The layout plan has been drawn on the

scale of 1:1500 with grid interval of 5 mt. and contour interval of 0.5 mt. Soft copy of the contour survey map of the Park & Safari is placed as **Annexure-5**. The Master (layout) Plan of the Sepahijala Zoological Park and Safari is placed at **Annexure-6**. Existing animal enclosures have been shown in black colour, to be modified in green colour, to be redone after demolishing in red colour, whereas all newly proposed animal houses are drawn in blue colour. The Master (layout) Plan also includes approach road to the Park, parking area, entrance gates, offices, roads and paths, interpretation centre, animal houses, natural streams, veterinary hospital, water works, power station and administrative block. The Master (layout) Plan also shows the location of the parks/lawns, service blocks and visitor amenities.

67.85% of the area of the Zoo Zone shall be developed as green cover including 10-meter-wide green belt along the periphery and the area earmarked for animal housings (indoor plus outdoor) shall be around 10.49% of the total Zoo area. Whole of Zoo and Safari campus will be encompassed by a chain link boundary fence of 2.5 mt. high.

For supply of feed and essential items a service gate has been proposed on north-western side of the animal's area opening onto the approach road to the Facility. Majority of the services will be undertaken through this gate. Another gate has also been proposed on north-eastern side near the Veterinary Hospital. This shall also act as an emergency entrance/exit. A service road connecting the service infrastructure and animal night houses has been proposed for unobstructed movement of service vehicles for supply of feed items to animals. The service gate/s and the network of service roads can be seen in the layout plan.

#### **4.6 Description of the proposed animal enclosures**

The Animal housing is the most important aspect of any captive wild animals' facility and all aspects of topography and vegetation have been kept in mind to locate housing for different species depending upon their habitats, habits and management convenience. Animal housing capacity has been planned as prescribed in the Animal Collection Plan. The enclosures have been designed taking care of social structures of the species to be housed, fulfilling biological and behavioural needs of the species.

All enclosure shall be provided with appropriate barriers which cannot be negotiated by the animals housed, to prevent any escape. Adequate attention has been paid by providing kraals for provision of isolation arrangements for protecting individuals or groups from aggressive behaviour of other individuals and to provide privacy and care to expectant mothers, injured animals and young ones. Night shelters and night cells of the appropriate dimensions as per prescription of the Central Zoo Authority shall be provided in animal enclosures. Round the clock potable water supply shall be ensured to all animal enclosures and feeding cubicles. Appropriate furnishing of the animal houses as per biological and behavioural needs of the animal species to be housed over there shall be undertaken. A separate 'Environmental Enrichment Plan' shall be prepared for the purpose which shall also have provisions for transplanting of plants of the desired species commensurate with the individual needs of the species including items such as boulders, trees, swings, platform, shrubs, logs etc. In addition to enrichment of enclosures, plantations of fruit bearing and other trees, shrubs etc. which are naturally found in the natural habitats of the respective species shall be carried out, wherever

possible. The guiding principle of wildlife display at the Zoological Park & Safari is to present them in an environment as natural as possible and maintain their dignity as our fellow creatures. Each animal house shall be provided with adequate drainage facilities so that the liquid wastes are drained out of the enclosures into nearby seweragenetwork without contaminating the surrounding areas.

#### **4.6.1 Lion/Tiger enclosures**

Each enclosure shall be with 5 number night cells (3+1+1) inclusive of one breeding cell and one with squeezing facility, 2000 plus sq. mt. paddock and two number 150 sq. mt. kraals. Each enclosure shall be encompassed with interwoven stainless-steel rope mesh fence of 5 mt. height and inverted at the top (1.5 mt.) at an angle of 60 degree and fixed on MS posts. The enclosures will be aligned in proper direction so that night houses can be approached from the service road. Around 30 mt. long viewing zone shall have 5 mt. deep and 8 mt. wide pucca moats. Whole area will have adequate vegetation & shades and will have water bodies.

#### **4.6.2 Leopard/Clouded Leopard/Himalayan Black Bear/Malayan Sun Bear enclosures**

Leopards, Clouded Leopard, Himalayan Black Bear and Malayan Sun Bear shall be displayed in open top enclosures fenced off with interwoven stainless-steel rope mesh of 4 mt. height with inverted steel plate of 1.5 mt. width at 60-degree angle at the top fitted and fixed with MS posts. Each enclosure shall be provided with paddock area of over 2000 plus sq. mt. with 5 celled night shelter and two number 120 sq. mt. top covered kraal. It will be ensured to not to have any tree or tall object within 6 mt. (4 mt. in case of Bears) radius of the fence/moat. Around 30 mt. long viewing zone shall have 4 meter deep 8 mt. wide pucca moat or glass barriers.

#### **4.6.3 Small cats/Civets' enclosures**

Small cats and civets' enclosures will also be open at the top. There shall be night shelter with 4 number night cells in the rear while the enclosures shall have interwoven stainless-steel rope fence. The height of the fence shall be 4 mt. with inward slant at 60 degrees with steel plates of one-meter width at the top. Each enclosure shall be provided with paddock area of around 1200 plus sq. mt. with two number 60 sq. mt. top covered kraals. 10 mt. long viewing zone shall have glass or piano string barriers. Glass barriers shall be enclosed with structures having the appearance of natural rocks and local rock configurations and topography at the site. This will avoid the common problem of glare and reflection from the glass which disturbs proper viewing.

#### **4.6.4 Wild Dog/Grey Wolf/Hyena enclosure**

Each enclosure shall be with 4 no. night cells (2+1+1) inclusive of one breeding cell and one with squeezing facility, around 1200 plus sq. mt. paddock and two number top covered kraal of 100 sq. mt. each. Each enclosure shall be encompassed with interwoven stainless-steel rope mesh fence of the height of 3 mt. and inverted at the top at an angle of 60 degree and fixed on round MS posts. The enclosures will be aligned in proper direction so that night house can be approached from the service road. 12 mt. long viewing zone shall have glass or piano barrier. Whole area will have adequate vegetation & shades and will have water bodies.

#### **4.6.5 Jackal and Fox enclosures**

Jackal and Fox enclosures will also be open at the top. There shall be night shelter with 4 number night cells in the rear while the enclosure shall have interwoven stainless-steel rope mesh fence. The height of the fence shall be 3 mt. with inward slant of 60 degree with rope mesh of one-meter width at the top. Each

enclosure shall be provided with paddock area of around 1000 sq. mt. with two top covered kraals of 60 sq. mt. each. 10 mt. long viewing zone shall have glass or piano string barrier. Glass barriers shall be enclosed with structures having the appearance of natural rocks and local rock configurations and topography at the site. This will avoid the common problem of glare and reflection from the glass which disturbs proper viewing.

#### **4.6.6 Primates Houses**

All the primates have been displayed in open airmoated enclosures. Each enclosure shall be equipped with 4 celled night shelter and two number top covered kraal of 100 sq. mt. each.

#### **4.6.7 Hippopotamus enclosure**

Hippopotamus shall be provided 3000 sq. mt. enclosure with two sections of 1400 sq. mt. each, half of each section shall be in form of at least 2 mt. deep water body in the centre. Night shelter with 3 number cells and two kraals of 150 sq. mt. each shall also be provided in the rear close to service road.

#### **4.6.8 Rhino enclosure**

There shall be a large (3000 sq. mt. and above) Rhino house with independent paddock and night shelter. The enclosure shall be covered on three sides with thick brick/stone masonry wall of 2.0 mt. height which shall act as barrier in the paddocks. Two number kraals (of around 200 sq. mt.) with brick/stone wall shall be attached with night shelter for segregation of animals with special needs. 2.0 mt. deep and 3.0 mt. wide pucca dry moats of around 30 length shall be provided on the viewer's side. Attempt shall be made to take advantage of the

natural topographic feature/drops on the site. Marshy land of about one third of the paddock area shall be provided on one corner.

#### **4.6.9 Gaur, Sambhar and Nilgai enclosures**

These shall be large (3000 sq. mt. and above) with independent paddocks and small night shelters for the species. Each enclosure shall be covered on three sides with interwoven stainless steel rope mesh fence of 2.5 mt. height which shall act as barrier in the paddocks. The chain link mesh shall be supported by MS posts. Moats shall be avoided in all enclosures in the lower slopes and attempt shall be made to take advantage of the natural topographic feature/drops on the site. Two number top covered kraal (of around 100 sq. mt. each - 150 sq. mt. in case of Gaur) shall be attached with each night shelter for segregation of animals with special needs.

#### **4.6.10 Wild Boar enclosure**

Wild Boar shall be displayed in a large (2000 sq. mt. and above) with independent paddock and small night shelter. The enclosure shall be covered on three sides with interwoven stainless steel rope mesh fence of 2.0 mt. height which shall act as barrier in the paddock. Two top covered kraals (of around 100 sq. mt.) shall be attached with night shelter for segregation of animals with special needs. Moats shall be avoided in the enclosures in the lower slopes and attempt shall be made to take advantage of the natural topographic feature/drops on the site. The chain link mesh shall be supported by round MS posts.

#### **4.6.11 Sangai, Cheetal and Black Buck enclosures**

These shall be large (3000 sq. mt. and above) with independent paddocks and small night shelters for each species. Each enclosure shall be covered on three sides with interwoven stainless steel rope mesh fence of 2.5 mt. height which shall act as barrier in the paddocks. Two number top covered kraal (of around 100 sq. mt. each) shall be attached with each paddock for segregation of animals with special needs. Moats shall be avoided in all enclosures in the lower slopes and attempt shall be made to take advantage of the natural topographic feature/drops on the site. The chain link mesh shall be supported by round MS posts.

#### **4.6.12 Barking Deer/Hog Deer/Red Goral/Red Serow enclosures**

These shall be large (1200 sq. mt. and above) with independent paddocks and small night shelters for each species. Each enclosure shall be covered on three sides with interwoven stainless steel rope mesh fence of 2.5 mt. height which shall act as barrier in the paddocks. Two number top covered kraal (of around 100 sq. mt. each) shall be attached with each night shelter for segregation of animals with special needs. Moats shall be avoided in all enclosures in the lower slopes and attempt shall be made to take advantage of the natural topographic feature/drops on the site. The chain link mesh shall be supported by MS posts.

#### **4.6.13 Otter enclosure**

A pucca pond of 200 sq. mt. (depth 1.5 to 2.0 mt) with an island of around 50 sq. mt. within a paddock area of around 500 sq. mt. shall be created for housing of Otter. Paddock shall be surrounded by 1.5 mt. high concrete wall. Service gate shall be provided on the back as no night shelter is required. Provision of water circulation shall also be made.

#### **4.6.14 Nocturnal House**

Large top covered Nocturnal house with 10-15 dens/paddocks (of 50 sq. mt. to 150 sq. mt. area) as per guidelines/specifications of the CZA will be constructed for housing different species of animals active during the night (porcupine, pangolin, slow loris, owls, etc). Each den/cell will be fitted & fixed with glass for viewing animals by visitors and at the rear end of the den/cell Keepers' space will be provided, and top will be covered metal net for aeration. For keeping all the species in proper habitat, rockery/water body/bamboo/logs & tree trunks will be provided inside each den/cell. Efforts shall be made to provide top covered kraals in the rear for segregation of animals with special needs and occasional release of the animals housed in open during the days/nights.

#### **4.6.15 Ostrich and Emu enclosures**

Emu and Ostrich houses shall be large with independent (around 1000 sq. mt) paddocks and small night shelters for each species. Each enclosure shall be covered on three sides with interwoven stainless steel rope mesh fence of 2.5 mt. height which shall act as barrier in the paddocks. Two number top covered kraal (of around 100 sq. mt. each) shall be attached with each paddock for segregation of animals with special needs. Moats shall be avoided in all enclosures in the lower slopes and attempt shall be made to take advantage of the natural topographic feature/drops on the site. The chain link mesh shall be supported by MS posts

#### **4.6.16 Mixed species water birds aviary**

Standard top covered chain link mesh caged enclosure (3500sq.mt.) shall be provided for water loving birds with water body as prescribed by the Central Zoo Authority for the same.

#### **4.6.17 Mixed species flying-bird aviary**

Standard top covered chain link mesh caged enclosure (3500sq. mt) shall be provided for mix flying birds with water body as prescribed by the Central Zoo Authority for the same.

#### **4.6.18 Birds of prey aviaries**

Six units of birds of prey (single species) aviaries of 300 sq. mt. (8 mt. height) each of standard design and size shall also be created to accommodate different species of birds of prey mentioned in the collection plan.

#### **4.6.19 Pheasant houses**

The minimum prescribed size of CZA for the outdoor enclosures (Peafowl 200 sq. mt. and other pheasants 100 sq. mt. each, height 3 mt) will be followed. Each aviary/pheasant cage(1 plus 7 units) will be a covered with wire mesh. The viewing will be through toughened glass or piano string wire. Perches of bamboo and wooden branches of varying diameter will be provided. Each enclosure will be provided water body as prescribed by CZA.

#### **4.6.20 Hornbill aviaries**

Five number aviaries of around 150 sq. mt. each shall be created for housing of different species of hornbills as shown in the Master (layout) Plan following prescription laid by the Central Zoo Authority for the same.

#### **4.6.21 Flying birds (single species) aviaries**

Six units of flying birds (single species) aviaries of 100 sq. mt. (6 mt. height) each of standard design and size shall also be created to accommodate flying birds like macaws, cockatiel, parakeets, etc.

#### **4.6.22 Small flying birds' aviaries**

Small adjacent cages (6 units of 30 sq. mt. each) shall be created for small flying (cockatiel, love birds, budgerigars, etc.) birds as per prescription of the CZA for the same.

#### **4.6.23 Reptile house**

Large, covered Reptile house (Monitor lizard, water monitor, turtle, tortoise, snakes, pythons, etc) with around 30 dens as per guidelines/specifications of the CZA will be constructed for housing different species of reptiles. Each den/cell will be fitted & fixed with glass for viewing animals by visitors and at the rear end of the den/cell Keepers' space will be provided, and top will be covered with 1 cm x 1 cm metal net for aeration. For keeping all the species in proper habitat, rockery/water body/bamboo/logs & tree trunks will be provided inside each den/cell.

#### **4.6.24 Crocodile pond**

The enclosure will be surrounded by brick wall or chain-link mesh of 2.0 mt. height all around. A slopping water body of about 400 sq. mt. with a depth of 2 mt. will be developed. The rest of the area will have sand and soft soil. There will be an inlet and outlet to maintain the water level. There will be a service gate towards the service road in the exhibit.

#### **4.6.25 Aquarium**

Modern aquarium shall be established at the place shown in the Master (layout) Plan displaying freshwater fish found in Tripura and north-eastern region of India. It will be aesthetically designed to attract the visitors and create awareness about aquatic life forms, by providing suitable artefacts in each aquarium.

#### **4.6.26 Mixed species Safari**

Mixed species Safari (33.04 hectares) shall be encompassed by stainless steel fence of 2.5-meter height as animal barrier leaving 10 mt. wide green belt all along the periphery. Five sets of night shelters shall be created with two number kraals (100 sq. mt.) each for the herbivores of different sizes (i) Gaur, (ii) Nilgai/Sambhar/Red Serow, (iii) Chital/Black Buck/Sangai, (iv) Barking Deer/Hog Deer/Red Goral, and (v) Wild Boar-1. All the released herbivores (around 88 animals of 11 different herbivore species) and free living animals, birds, reptiles, amphibians, and invertebrates shall freely be moving all over the Safari area premise. One/two lakes with one/two independent islands shall be created in heart of the lake/s. Live fish of different species naturally found/mentioned in the Tripura in different water bodies and streams shall also be introduced/released in the lake/s. Feeding platforms/trays shall be placed for free living animals at appropriate locations. Nests, nesting materials, tree hollows, burrows, dens etc shall also be created/provided for such animals and birds. Plants species which attract butterflies and other insects shall also be planted to attract such animals at identified locations.

#### **4.6.27 Off Display Conservation Breeding Centre**

The Central Zoo Authority has assigned the responsibility of planned conservation breeding (as coordinating Zoo for whole of India) of critically endangered clouded leopard, binturong, spectacled langur and pig tailed macaque to Sepahijala Zoological Park and Safari. Off-Display Conservation Breeding Centres (2 units each) have been established for all the four species on back side of Tiger and Lion

houses on the southern side of the Park. All the enclosures need improvement in the night shelters, creation of kraals and expansions of paddocks.

#### **4.6.28 Rescue and Rehabilitation Centre**

Recently, the Zoo (being the only Zoo in the state of Tripura) has played a crucial role in rescue and aftercare for numerous animals. Many of these animals have successfully undergone rehabilitation. Recognizing the increasing need for a specialized facility, the Zoo is actively working towards the establishment of a Rescue cum Rehabilitation Centre. This centre will serve as a crucial hub for offering immediate care and rehabilitation to injured or orphaned animals of various species. Around 4.0 hectares of area along the north-eastern side has been earmarked for creation of Rescue and Rehabilitation Centre for new arrivals and animals in distress (rescued, seized, old, young and injured) for temporary housing. Leopard, bear, monkey, langur, lesser carnivores, herbivores, peafowl, birds of prey, snakes and other reptiles are the main animal species generally need to be dealt under rescue and rehabilitation in the region. The Zoo has seized/rescued/received more than 1000 animals (Himalayan black bear-8 number, different primates-16 number, different smaller carnivores-114 number, different herbivores-13 animals, different types of flying birds-161 in number and around 525 number of different snakes and other reptiles) between 2017-18 to 2022-23. Accordingly, housings for i. leopards/Himalayan black bear (two units accommodating around 8 animals), ii. Primates (two units to accommodate at least 8 animals), iii. lesser carnivores (one unit for around 4 animals), iv. herbivores (two units with accommodation for around 8 animals), v. flying birds/birds of prey (two units with accommodation for 6 animals) and vi. land

birds/peafowls/reptiles(two units with accommodation for 6 animals) with segregation cells and covered paddocks each shall be established as part of the Centre.

#### **4.6.29 Quarantine Ward**

Around 1.0 hectare of area along the north-eastern boundary between graveyard and rescue and rehabilitation centre has been earmarked for creation of Quarantine Ward for new arrivals. Quarantine facility of one unit each for (i) large carnivores (one unit with accommodation for 3-4 animals), (ii) primates (two units with accommodation for 6-8 animals),(iii) herbivores (two units with accommodation for 6-8 animals), and (iv) small animals/birds (one unit with housing capacity of 3-4 animals) shall be created.

#### **4.6.30 Off-display enclosure for phasing out of Spotted Deer**

At present there are more than 300 spotted deer in the Zoo. The excessive population growth of spotted deer needs to be controlled. Already certain measures have been taken to control birth of spotted deer which need to be continued. In this process, two off-display enclosures with around one hectare paddock each, proper night shelter and kraals for segregated male and female spotted deer shall be established as shown in the Master (layout) Plan to further control the birth rate.

#### **1.1 Main Entrance**

There shall be a common entrance and exit gate (main entrance) next to the ticket counters. Ticketing windows shall be provided just outside the main

entrance. Entrance shall also be housing the ticket checking booths, information centre, childcare room and cloak room, etc.

#### **4.8 Parking zone**

An area of about 4.0hectares will be developed for parking of buses, cars, and two wheelers. The area shall be able to accommodate around 100 cars, 150 two wheelers and 10 buses at a time. The parking operation will be leased out.

#### **4.9 Boundary Fence**

The Park& Safari will be encompassed by a boundary fence (3.112 kmlong) of 2.5-meter height with chain-link mesh.

#### **4.10 Administrative Section**

Director will be a whole-time officer and overall, in charge of the Zoological Park& Safari operation. He/she will be responsible to the Tripura State Zoo Authority, Chief Wildlife Warden, Government of Tripura, Central Zoo Authority and Government of India. He/she will be assisted by the Deputy Director, Veterinary officer, Curators and other support staff for smooth running of the Zoological Park& Safari. A new Administrative Section building has been proposed which will include the offices of Director, Deputy Director and ministerial staff. This building will have small conference room, store, parking, toilet and drinking water facilities.

##### **4.10.1Wings**

This section will have following wings

- i. Director's Personal Section
- ii. Establishment Section

- iii. Accounts Section
- iv. Correspondence Section
- v. Docket and Dispatch Section

#### **4.10.2 Duties and responsibilities**

- i. To process recruitment of staff when required.
- ii. To maintain service books and ACRs of employees.
- iii. To maintain diary and dispatch of letters.
- iv. To invite tender for supply of diet and maintenance articles.
- v. To invite tenders for leasing out parking site, cafeteria, kiosk, etc.
- vi. To process for outsourcing the various works and to engage manpower on contract.
- vii. To coordinate various meetings.
- viii. To undertake correspondence with state ministries, TSZA, CZA and others.
- ix. To process pension cases in time.
- x. To deal cases of ACRs, promotion, disciplinary action and enquiries.
- xi. To process returns well in time.
- xii. To procure furniture, stationary, liveries for employees etc.
- xiii. To prepare Plan & non-plan budget and revise estimates.
- xiv. To process cases of GPF withdrawal and retirement benefits.
- xv. To prepare regular pay bills, arrear bills, DA and Bonus, LTC, TA, medical reimbursements, gratuity, leave encashment bills.
- xvi. To issue salary slips, GPF statements and Form-16 of Income Tax.
- xvii. To process cases of loans for cars, scooters, bicycles and house

buildings, etc.

- xviii. To maintain record of visitor data & revenue collected.
- xix. To submit monthly statement of expenditure to higher authorities.
- xx. To process telephone, water and electricity bills.
- xxi. To prepare duty roaster for booking counters.
- xxii. To maintain cash book, contingency register, Cheque and Challan registers.
- xxiii. To deposit cash collected from gate and pickup point.
- xxiv. To keep record of entry tickets.
- xxv. To pass the bills of outsourced agencies.

#### **4.10.3 Staff requirement**

Office Superintendent/HC - 1

PA to the Director - 1

Accountant/UDCs – 3

LDCs – 4

Ticket Clerks – 2

Driver - 2

Attendants/Peons – 3

#### **4.11 Animal Section**

The Animal Section is the most important section of any captive animals' facility. The importance of a Zoological Park depends upon the quality of exhibits rather than the number of species it displays. This Section is responsible for the upkeep of animals and their housings so that they get a hygienic and naturalistic environment.

All aspects of topography and vegetation has been kept in mind to locate housings for different species depending upon their habitats, habits and management convenience. Animal housing capacity has been planned as prescribed in the Animal Collection Plan. The enclosures have been designed taking care of social structure of the species to be housed, fulfilling biological and behavioural needs of the species.

All enclosure shall be provided with appropriate barriers which cannot be negotiated by the animals housed, to avoid any escape. There shall also be appropriate hedges and stand of barriers of proper specifications in the viewing areas of each enclosure to prevent visitors coming too close to the main barrier. Adequate attention has been paid by providing covered/open kraals for provision of isolation arrangements for protecting individuals or groups from aggressive behaviour of other individuals, like for expectant mothers, injured animals and young ones. Potable water supply shall be ensured to all animal enclosures, kraals and feeding cubicles.

Appropriate furnishing shall be provided in commensuration with the individual needs of the species such as boulders, trees, swings, platform, shrubs, logs etc. In addition to enrichment of enclosure, plantation of fruit bearing and other trees, shrubs, herbs, grasses, etc. which are naturally found in the habitats of the respective species shall be carried out wherever possible. Each animal house shall be provided with adequate drainage facilities so that the liquid wastes are drained out of the enclosures into soak pits without contaminating the surrounding areas. Efforts shall be made to give immersion effect to different enclosures through appropriate planting, providing undulations and other means. Efforts shall be

made to mark most of the animals with transponders (carnivores/bear/primates), ear tags (herbivores), rings (birds) or others-like physical marking (reptiles) means for identification.

#### **4.11.1 Duties and responsibilities**

- i. To ensure cleanliness and maintenance of enclosures, animal houses and their surroundings.
- ii. To ensure daily optimum supply of diet and drinking water to all the animals housed.
- iii. To record and reporting of health and feeding conditions of animals on daily basis.
- iv. To keep liaison with Veterinary Section for health-related issues and treatment of animals.
- v. To dispose of carcasses in burial ground/incineration with assistance of sanitation and veterinary staff.
- vi. To keep liaison with Maintenance Section for repairs of damaged enclosures, cages, doors, gates, other structures and miscellaneous works to prevent escape of animals.
- vii. To maintain records of all livestock, food distribution and inventories
- viii. To maintain keeper's dairy, daily report and animal inventory register, etc.

#### **4.11.2 Staff requirement**

Following staff are proposed for in this Section:

Curator (Animals)/Deputy Director - 1

Animal Supervisor/FR - 2

Assistant Animal Supervisors/Fr - 2

Animal Keepers - 29

Animal Attendants - 40

#### **4.11.3 Office Building**

It is proposed to have a separate office building with storeroom for Animal Section as shown in the Master (layout) Plan.

#### **4.11.4 Proposal for activities**

The animal enclosures have been arranged on taxonomical lines and for managerial convenience proposed to be divided into two Zoo ranges and 20 number beats/sections.

Beat no. 1 – Large Cats

Beat no. 2 – Small cats

Beat no. 3 – Lesser carnivores

Beat no. 4 - Dog family

Beat no. 5& 6 - Herbivores

Beat no. 7 & 8 - Primates

Beat no. 9 & 10 – Aquarium

Beat no. 11 – Nocturnal House

Beat no. 12, 13 & 14 - Birds

Beat no. 15 & 16 – Reptile House, Magar and Otter

Beat no. 17 – Off display Conservation Breeding Centre

Beat no. 18–Off display Rescue and Rehabilitation Centre/Quarantine Centre

Beat no. 19 – Off display Spotted Deer enclosures

Beat no. 20 - Mixed Species Safari

Each Beat shall be manned in such a way that at least one Animal Keeper and one or two Animal Attendants are on duty in each Beat on each day.

#### **4.12 Veterinary Section**

To deal with animals in distress, there shall be a veterinary hospital under the charge of specially qualified and experienced veterinarians and required trained supporting staff. Sepahijala Zoological Park and Safari will have a regular veterinary hospital with all basic infrastructure like veterinarian's chambers, operation theatre, pathological laboratory, in-patient wards and dispensary room. The site has been chosen on the eastern side on the approach road as shown in the Master (layout) Plan away from the animal's area. In-patient ward with isolation ward shall also serve as the nursery for young, rescued animals and as well as the quarantine area. Post-mortem room and carcass disposal facility (incinerator and graveyard) has also been identified on other side away from animal houses. The Hospital shall have tranquilizing gadgets with tranquilizing drugs, along with wide range of medicines and vaccines. The hospital needs a portable X-ray unit for early diagnosis and treatment. The pathological lab shall be well equipped to deal with blood smear, urine, faecal, skin examination etc. on routine basis. All rescued/ abandoned young wild animals shall only be reared in nurseries attached to the Veterinary Hospitals of the Zoological Park& Safari.

#### **4.12.1 Health Advisory Committee**

A Health Advisory Committee has been formed in Sepahijala Zoological Park to advise the Zoo management on animal's health care related matters. The Committee shall continue to play the same role for Sepahijala Zoological Park and Safari. Copy of the notification of the Health Advisory Committee is place as **Annexure-7**.

#### **4.12.2 Hospital will have following facilities**

- i. Veterinarians' chambers, library, records room.
- ii. A separate operation theatre for surgical treatment.
- iii. A self-contained laboratory for conducting pathological tests.
- iv. An X-ray unit with dark room.
- v. A dispensary/pharmacy with storage facility for wide range of medicines.
- vi. Appropriate housing for in-door patients.
- vii. A nursery unit for hand rearing of baby animals.
- viii. Store and kitchen for animal feed for animals under treatment.
- ix. Quarantine/isolation ward (location as shown in the Master (layout) Plan)
- x. Post-mortem room (location as shown in the Master (layout) Plan)
- xi. Incinerator facility/graveyard (location shown in Master (layout) Plan)

#### **4.12.3 Duties and responsibilities**

- i. Inspection of the Zoological Park& Safari animals, identification of animals in distress and treating them.

- ii. To maintain the record of treatment (treatment cards) of inpatient and outpatient animals.
- iii. Formulation of diet chart and quality control of feed issued to the Zoo animals.
- iv. To follow prophylactic protocol, periodical examination of faecal matter, skin and blood and de-worming, vaccination and disinfection schedules.
- v. To take measures for preventive disease control in the Zoo.
- vi. To check the quality of the food daily.
- vii. Monitoring of pregnant females till successful delivery & post-delivery care.
- viii. Planning breeding strategy of endangered species and their husbandry.
- ix. Physical and chemical capture of the Zoo animals, whenever required.
- x. To maintain the inventory of the equipment and medicines.
- xi. To guide the rescue operation when needed.

#### **4.12.4 Equipment requirement**

- i. Appropriate treatment cages/beds with squeeze facility for in-patients (large carnivores, small carnivores, primates, herbivores, land birds, flying birds, reptiles, etc.)
- ii. Medicines and proper storing facilities including refrigeration
- iii. Laboratory equipment - Microscope, bacteriological incubator, haematology unit, deep fridge, glassware, chemical regents, and other accessories.
- iv. Sterile surgical equipment and other instrumentation for diagnosis and treatment.

- v. Autoclave.
- vi. An X-ray unit, darkroom facilities and photographic material.
- vii. An incubator unit for baby animals.
- viii. Equipment and instrumentation for conducting post-mortems.
- ix. Chain-pulley equipment for hoisting animal cages.
- x. Room heaters, coolers etc. as per requirement.
- xi. Kitchen ware, mixer-cum-food processor, storage containers, special items like feeding bottles, nipples, cooking gas and stove.
- xii. Nets for capturing animals.
- xiii. Ropes and poles etc.
- xiv. Hospital furniture.
- xv. Tranquilizing equipment & drugs (may be updated/modified as per actual requirement).

S. No.	Equipment, accessories & drugs	Quantity
1	Rifle model 60	1
2	Blow pipe	2
3	4 ml. alum. Barrel for metal syringe	10
4	5ml alum. Barrel for metal syringe	10
5	Rubber plunger	10
6	Needles with collar art. 3040	10

7	Stabilizer art. 3049	10
8	Art 2006 chargers for metal syringes	20
9	Art 2013 cartridge (yellow)	20
10	Cartridge (brown)	20
11	Mini inject 3ml	5
12	Mini inject 5ml	5
13	Woollen stabilizer art 3092	5
14	Needles art 3068	10
15	Ketamine -100	50ml 1x2
16	Xylazine – 100	50ml 1x2
17	Yohimbin hydrochloride	50ml 1x2

#### **4.12.5 Staff requirement**

Following staff will be needed in this section.

Senior Veterinary Officer - 1

Veterinary Officer - 1

Lab Technician - 1

X-Ray Technician - 1

Veterinary Compounder - 2

Animal keeper - 1

Attendant - 5

### **4.13 Sanitary Section**

A good zoo is certainly one, which has also made provisions for good sanitation facilities. Better sanitation takes care of the health of the animals. The Sanitary Section will provide clean and pollution free environment. This Section will be responsible to remove leftover food, dung, cut grasses, fallen leaves, weeds and other items. All roads, footpaths, toilets, drinking water points and rain shelters will be cleaned and maintained. Disinfection schedule will be followed round the year. Regular drainage for discharge of effluent is a must. Hygiene of the enclosures and the Zoo surroundings shall be ensured throughout, to prevent diseases to the animals. Local made dustbins shall be provided in every corner of the Zoological Park. Garbage dumping site has been identified near the service gate. The biodegradable waste shall be collected and disposed of by composting for use in the Park gardens/lawns or taken away by the Zoo staff. Improvement is required in pest/mosquitoes/rodents' control, etc. Extra care will be taken during any disease outbreak either transmitted through the wild ones or by their domestic counterparts or through any new arrival.

#### **4.13.1 Office building**

It is proposed to construct a separate composite office building with storerooms for Garden Section and Sanitation Section at the location as shown in the proposed Master (layout) Plan.

#### **4.13.2 Duties and responsibilities**

- i. Cleaning of roads, footpaths, toilets & urinals.

- ii. To remove and dispose garbage, leftover food, animal waste, bones, fallen leaves, cut grasses, weeds, tobacco pouches and plastic items.
- iii. Regular cleaning of drinking water points & tanks.
- iv. To spray malaria oil to check mosquito breeding.
- v. To control flies in Zoological Park premises.
- vi. To cleaning and dusting of all Section offices.
- vii. To control rodents by using traps particularly in feed store, aviaries and night houses.
- viii. To follow the disinfection schedule for animal enclosures

#### **4.13.3 Staff requirement**

Sanitary Supervisor/FR – 1

Assistant Sanitary Supervisor/Fr – 1

(The Sanitation work is proposed to be outsourced. The agency shall provide services (manpower) inclusive of consumables, equipment and implements as per acre basis)

#### **4.14 Garden Section**

A separate Section to be known as Garden Section shall be established to deal with this aspect of Zoological Park& Safari. The Section will be responsible for creation and maintenance of naturalness in the Zoological Park& Safari. It will be responsible for all works related to plantations and maintenance of trees, gardens and lawns, etc. A Plant Nursery shall be developed near the staff quarters campus for in-house consumption of seedlings. Hydrants line will be provided along the visitor circulation road with provision of sub-lines for sprinkling and watering the

plants, trees and lawns etc. The Section shall also be responsible for procurement of seeds and growing of seedlings as per seasonal requirement.

#### **4.14.1 Office Building**

A separate composite office building with storerooms is proposed for Garden Section and Sanitation Section at the location as shown in the proposed Master (layout) Plan as stated before.

#### **4.14.2 Duties and responsibilities**

- i. To maintain lawns, trees, hedges and plants.
- ii. To remove weeds from lawns and hedges etc.
- iii. To provide water to lawns and trees.
- iv. To remove and collect dry leaves from lawns.
- v. To remove uprooted/dead trees whenever occasion arises.
- vi. To prepare seedlings of plants as per season.
- vii. To collect seeds and keep them for future use.
- viii. To maintain flowering and small plant earthen pots.
- ix. To maintain botanical trail.
- x. To maintain the record of manpower supplied, work undertaken, and implements used by outsourcing agency.

Note: No equipment and implement are to be provided as this work is proposed to be outsourced. The agency shall provide services inclusive of consumables, equipment and implements as per acre basis. The Section will provide store facilities to the outsourced agency to keep the equipment and implements.

#### **4.14.3 Staff requirement**

Garden Supervisor/FR – 1

Assistant Garden Supervisor/Fr – 1

(The Garden work is proposed to be outsourced. The agency shall provide services (manpower) inclusive of consumables, equipment and implements as per acre basis.

#### **4.15 Security section**

This Section will be responsible to safeguard the Zoo properties, animals and animal enclosures and to maintain law and order. It will also take care to check thefts, pick pocketing, trespassing, animal escape at night and entry of stray animals in the Zoo premises. Security Section shall be housed in a building near the service entrance with a CCTV control room, small store, a toilet and rest room. Three watch towers/security sheds at the identified strategic locations shall be created for round the clock watch ward. It will also be the duty of the Section to take police assistance, in case of theft of Zoological Park & Safari properties or aberrant behaviour of visitors or general public.

##### **4.15.1 Duties and responsibilities**

- i. To patrol the Zoo area day & night.
- ii. To protect the Zoo property, animals and visitors.
- iii. To check illicit cutting of trees.
- iv. To maintain law and order at entrance and inside the Zoo area.
- v. To assist public in lost & found.
- vi. To interact with local police whenever needed.

- vii. To control vandalism, pick pocketing and teasing of animals.
- viii. To frisk visitors at entry, point whenever required.
- ix. To man service & entry gates.

#### **4.15.2 Staff requirement**

Security Supervisor/FR – 1

Assistant Security Supervisor/Fr – 4

This work is proposed to be outsourced. The agency shall provide services (manpower) inclusive of consumables, equipment and implements on annual basis.

#### **4.15.3 Equipment requirement**

- i. To establish a network of CCTV for surveillance at the entrance and animal enclosures.
- ii. To establish a network of public address system (PA) at entrance, administrative building, veterinary hospital and one or two more places within the Zoo area.
- iii. Internal communication system, wireless or mobile phones.
- iv. Telephone lines.

#### **4.16 Commissary Section**

A well-developed Commissary Section is proposed to be constructed which will have ample space to store the food as well as for food preparation. It will have a storage room, feeding troughs, storage containers, kitchen, refrigeration room or

cold storage for the storage of items like meat, milk, fish, greens and fruit. It will have a weighing machine, and a platform for loading and unloading store items.

#### **4.16.1 Office Building**

It is proposed to have a separate office building with all the above-mentioned facilities for the Commissary Section as shown in the Master (layout) Plan.

#### **4.16.2 Duties and responsibilities**

- i. To procure, store and supply diet articles.
- ii. To get the quality of food checked by Veterinary Officer on daily basis.
- iii. To prepare daily ration as per schedule for all animals and its distribution.
- iv. To keep the record of purchase and disposal of all items.
- v. To get the store record audited every year.
- vi. To process for the write off of obsolete items.
- vii. Any other item required for running and maintenance of the Zoo.

#### **4.16.3 Equipment requirements**

- i. Food store containers (capacity 100kg-10nos, 500kg-5nos.).
- ii. Feeding trough – as per requirement
- iii. Container for oil – as per need.
- iv. Jute bags – as per need
- v. Keema machine – 1
- vi. Fodder cutting machine – 1
- vii. Utensils for kitchen – as per need

- viii. Weighting machine – 1
- ix. Dharma kanta – 1
- x. Solar water heating system.
- xi. A piped gas connection / cooking gas cylinder.
- xii. Truck for feed distribution
- xiii. Office furniture as per need
- xiv. A digital board for displaying of daily ration status.

#### **4.16.4 Staff requirement**

Storekeeper – 1

Cook – 1

Driver - 1

Attendants – 6

#### **4.17 Maintenance Section**

The Section will undertake construction and maintenance of buildings, animal enclosures, roads, footpaths, laying of service lines, overhead tanks, bore wells, power supply, etc. of the Park& Safari. This Section will also take care to protect animals against extreme summer and winter. There will be separate office and workshop with adequate space for keeping construction and maintenance material. It will also have enough space for parking of vehicles and keeping of transport cages under shed.

##### **4.17.1 Office Building and workshop**

It is proposed to have a separate building with workshops and storage facilities for Maintenance Section as shown in the Master (layout) Plan.

#### **4.17.2 Duties and responsibilities**

- i. Construction of buildings, animal enclosures, roads, footpaths, and service lines.
- ii. Maintenance of all buildings, animal enclosures, roads, footpaths, services, etc.
- iii. Repair and strengthening of steel sections, doors, partitions, up slides etc.
- iv. Lubrication of sliding/partition/gates/doors/pulleys/pressure pumps etc. to ensure their proper functioning.
- v. Dewatering of moats/ponds/wallow pools/water bodies, as and when required.
- vi. Repair pressure pumps/heaters/coolers and other miscellaneous equipment and to maintain them functional.
- vii. Replacement of damaged steel wire ropes of up-slide partitions/gates of animal enclosures.
- viii. To procure maintenance material as required by other Sections.
- ix. To get the store record audited every year.
- x. To process for the write off of obsolete items.
- xi. Any other item required for running and maintenance of the Zoo.

#### **4.17.3 Equipment requirement**

- i. Tools for carpenter as per requirement
- ii. Tools for welder as per requirement
- iii. Tools for mason as per requirement

- iv. Tools for plumber as per requirement
- v. Chain saw
- vi. Gas machine
- vii. Portable welding machine
- viii. Drill machine
- ix. Rotary Hammer

#### **4.17.4 Staff requirement**

Assistant/Junior Engineer (Civil)/FR – 1

Electrician – 1

Pump Operator – 1

Construction as well as maintenance (civil, mechanical and electrical) work is proposed to be outsourced (Annual Maintenance Contract). The agency shall provide services (manpower) inclusive of consumables, equipment and implements on annual basis. Senior engineers of the Public Work Department (PWD), Tripura can also provide their inputs for major construction/maintenance works.

#### **4.18 Education Section**

Zoological Park & Safari is a living educational Institute. It imparts first-hand knowledge and experience of nature to visitors. Zoo is also a place from where the visitors can get lot of information on wildlife and environment. As per CZA's norms on zoo education, every zoo should inspire empathy for wildlife, understanding and awareness about need of conservation of natural resources, besides maintaining ecological balance. 'Zoo Education Plan' shall be prepared

separately giving details of the activities undertaken along with the infrastructure required to be created for the purpose. A separate building housing Education Section and Research Section within Interpretation Centre will be created near the entrance. The interpretation centre will be able to accommodate up to 500 visitors at any point of time in the exhibit area, auditorium with projector room and the classroom. The building will have chamber for Education Officer and other staff, library, visitor's room, storeroom and toilets.

#### **4.18.1 Duties & responsibilities**

- i. To prepare the Zoo Education Plan.
- ii. To formulate and execute the educational programs of the Zoological Park& Safari.
- iii. To conduct guided tour particularly for students from time to time.
- iv. To publish educational material like guidebooks, guide maps, brochure and leaflets.
- v. To prepare material for animal, directional and utility signages.
- vi. To produce interactive exhibit signages.
- vii. To organize various awareness and orientation programs from time to time.
- viii. To provide information about wild animals to individual visitor and institutions.
- ix. To help in preparation of audio visuals on wild animals.
- x. To help and guide students in preparations of their projects.
- xi. To conduct lectures and presentation for organized groups.

- xii. To look after the Zoo library.
- xiii. To look after public relation work.
- xiv. Organise celebrations of Wildlife Week, Vanamahotsva, World Environment day etc.

#### **4.18.2 Equipment requirement**

- i. Audio-visual equipment and films on wildlife.
- ii. Power point projector with computer.
- iii. A photo copier.
- iv. Computer with internet facilities and printer.
- v. PA system.
- vi. Published material.
- vii. Panels with stands.
- viii. Books, newspapers, periodicals, and journal for library.
- ix. Binoculars
- x. Digital camera

#### **4.18.3 Staff requirement**

Following staff will be needed in this section.

Curator (Education) – 1

Education Assistant – 1

Attendants – 4

#### **4.19 Research Section**

The Sepahijala Zoological Park and Safari shall endeavour to carry out collaborative research for evolving innovative strategies for providing the animals

housed in the Park a better quality of life, enhanced longevity, higher genetic and behavioural viability and improved reproduction potential and to achieve the said goal the Park & Safari shall have a Research Section and make arrangements for meticulous recording of data on the social behaviour, group dynamics and reproductive biology of the species housed in the Park & Safari and develop a database to be shared with other zoos and the identified institutions, in accordance with norms specified by the Central Zoo Authority in this regard. The Section will also collect data on behaviour, breeding biology, growth, and hand rearing and population dynamics.

#### **4.19.1 Duties and responsibilities**

- i. To prepare the annual report of the Park& Safari.
- ii. To maintain the animal history card as per CZA format.
- iii. To maintain the stud book of endangered species.
- iv. To formulate research project and execute them.
- v. To keep liaison with research institutes.
- vi. To prepare replies to queries of visitors and institutes.
- vii. To publish research papers in the journals

#### **4.19.2 Staff requirement**

Zoo Biologist – 1

Research Assistant – 1

Attendants - 2

#### **4.20 Water supply**

The water will be obtained from the bore wells/wells/dams in and around the

Park & Safari area. Bore wells of 150 mm diameter and an average depth of 100 mt. are proposed to be drilled. Suitable submersible pumps, pumping house and pipelines will be provided on these bores. Water samples of different locations of the Park & Safari will be got tested. The water from bore wells will be collected in a reservoir of 5 lakh litres capacity. A water treatment plant (specifically for Iron removal) will be installed near reservoirs for its treatment before release through twin overhead tank of 50,000 litres capacity each. The water for drinking from all the sources will be filtered and then used for drinking purpose. Site Plan showing water supply/distribution is placed at **Annexure-8**.

#### **4.21 Electricity supply system**

One high tension room and one sub-station with transformers shall be installed as shown in the layout plan. Site Plan of electricity supply/distribution is also detailed in **Annexure-8**.

#### **4.22 Waste disposal**

##### **4.22.1 Solid Waste Disposal**

The solid waste of the Zoological Park will consist of following materials

- i. Leftover food.
- ii. Faecal matter.
- iii. Fallen leaves.
- iv. Cut grasses and weeds.
- v. Visitors left over.
- vi. Office waste.

Garbage dumping site has been identified near the service area on the north-eastern side of the Park. It has been proposed to segregate the non-bio-degradable waste from the bio-degradable waste. The non-bio-degradable waste will be disposed of by the authorized outsourced agency at the authorized site. The bio-degradable waste will be used to make manure through composting and the same will be used for gardening purpose.

#### **4.22.2 Liquid waste disposal (sewage)**

- i. All of the wastewater and sewage from the visitor centre, entrance plaza, staff quarters, etc. will be diverted to the STP in the service block.
- ii. Waste from animal houses, aviaries and aquarium will also be diverted to the STP.
- iii. The liquid waste will be treated in STP and after treatment the treated water will be used for flushing, landscaping and pavement cleaning.

Sewerage Site Plan along with provision of STP of 200 KLD capacity is also detailed in **Annexures-8**.

#### **4.22.3 Drainage and sewerage system**

The site has topographical features which facilitates the quick water runoff. It has been reported that for last 10 years that there has been no significant water logging in the site. Drainage Site Plan along with that of water network, electricity distribution network and storm water works is placed as **Annexures-8**.

#### **4.23 Visitor Amenities**

The Sepahijala Zoological Park and Safari is likely to cater to around 5 lakh

(assessment is based on the number of visitors to the Sepahijala Zoological Park currently and tourists passing through Agartala for visiting other places of interests in the surrounding areas) visitors annually. This will include adults, children, students, scientists, foresters, wild lifers, old, disabled and foreigners. It will be opened on all the days except Friday for the visitors. The following amenities will be developed.

#### **4.23.1 Entry Plaza**

The Entry Plaza will be developed at the entrance near the main entrance. It will have following facilities: -

- i. Entry and exit gate for vehicles and others with security posts.
- ii. Information Centre
- iii. Ticket booking windows (with a provision to increase) with visitor entrance.
- iv. Cloak room
- v. Washrooms
- vi. Public address system.
- vii. A ramp

#### **4.23.2 Nature Interpretation Centre**

A Nature Interpretation Centre-cum-Orientation Centre has been proposed next to the existing Veterinary hospital inside the main entrance. The Interpretation Centre will be able to accommodate up to 500 visitors at any point of time in the exhibit area, auditorium and the classroom. The building will also house the Education Section and the Research Section, Zoo library, visitor's room, storeroom and washrooms.

#### **4.23.3 Central Plaza**

A multiutility area to be known as Central Plaza has been planned in the south-western corner of the Zoo near the primates' enclosures. Central Plaza shall house souvenir shops, food courts, open air auditorium, and washrooms.

#### **4.23.4 Signages**

Directional sign boards shall be provided at different places on the visitors' path for guiding the visitors through the Zoological Park. Interpretative signages explaining all exhibits shall be provided in the display zones of all the animal houses.

#### **4.23.5 Park ride**

The visitors may opt for electric vehicles/vans in the Zoological Park against charges which will be decided by the authority concerned. This ride will also be run on contract basis. Entry to the Mixed Species Safari shall be through battery operated vehicles only.

#### **4.23.6 Wheelchairs**

Wheelchairs will be available at the entrance for the differently abled visitors free of charges.

#### **4.23.7 Sitting benches and shelters**

About 100 sitting benches and shelters will be provided at different locations for visitors.

#### **4.23.8 Toilets and drinking water points**

These facilities are proposed to be provided near the following locations: -

- i. Parking site.
- ii. Interpretation centre
- iii. In central plaza
- iv. On visitor's route (two number)

Note: Separate set of toilets shall be provided for differently abled persons for all the above locations.

#### **4.23.9 Cafeteria, kiosk and souvenir shops**

The visitors are expected to spend 3-4 hours to see the Zoological Park & Safari. They are likely to get tired. These facilities are proposed for their relaxing. The location of these amenities is as under:

- i. Cafeteria / Kiosk – near the parking area and in central plaza
- ii. Souvenir shop- near the entrance and in central plaza
- iii. Food court – in the central plaza.

All these will be leased out

#### **4.23.10 First aid kits**

First aid kits shall be available at administrative building and veterinary hospital.

#### **4.23.11 Dustbins**

About 100 dustbins will be placed at different locations to collect waste and leftovers.

#### **4.24 Visitor circulation**

The visitor's circulation is well defined and is from left to right. The visitors shall continue to be reaching the Park & Safari from the highway using 4 km long

approach road. After parking and procurement of the entry tickets, the visitors shall enter the animals' area. The entry leads to the interpretation centre for orientation. After visiting the interpretation centre, the visitors may start walking or go to pick up point to board the electric van. The visitors shall see the herbivore enclosures on the left and different lesser carnivores and small cats on the right side of the visitor's road. Large carnivores (tiger, lion and common leopard) and aquarium are the next on left side of the road whereas clouded Leopard and nocturnal house made up the right hand. There will be a Central Plaza with open air theatre, food courts, souvenir shop, etc on the left hand with some pheasant houses on the right taking the visitors to the second loop displaying primate islands. Back from the loop the visitor's road shall take right turn with reptile house, crocodile and Otter ponds on the left hand and various birds cages on right. Large mixed species water birds and land birds' aviaries and birds of prey cages on the left with hornbills, land flyingbirds' cages and later dog family enclosures on the right leads the visitors to the exit (clubbed with entrance), but not before bear houses completing the loop. Entry to Mixed Species Safari shall be from separate gate on the north-eastern edge of the Zoo.

#### **4.25 Zoological Park & Safari timings**

9:00 am to 5:00 pm (last ticket to be issued at 4:30 pm). The Park & Safari will remain closed on Friday and all national holidays (26<sup>th</sup> January 15<sup>th</sup> August and 2<sup>nd</sup> October).

#### **4.26 Animal Adoption Scheme**

Animals Adoption scheme is an opportunity, where the zoos offer the zoo animals/animal species in their collection to the general public for taking care of

them. Through this scheme, the Sepahijala Zoological Park and Safari shall be in more direct public contact with enhanced accountability. This scheme shall be open to general public, animal lovers, corporate sector, celebrities, educational institutions, etc.

Adoption scheme would help the Park& Safari in involving conscious and esteemed people and companies in bringing more awareness about the plight of the endangered species. It shall be benefited by adopter's interest towards conservation of animal wealth of our globe. The contribution would assist in improving the existing overall facilities for animals and ultimately for their better care and conservation in the Zoological Park& Safari.

## Chapter – 5

### 5.1 Personnel planning

The Sepahijala Zoological Park shall be redeveloped as Sepahijala Zoological Park & Safari on the same site in Sepahijala District (Tripura) and shall continue to be managed by the Forest Department, Government of Tripura. The Chief Wildlife Warden, Tripura shall continue to be the overall administrative head of the Zoological Park & Safari. The Zoo Director designate shall be responsible for day-to-day administration of the Sepahijala Zoological Park and Safari.

It is proposed to form a registered society to be known as Tripura State Zoo Authority (a registered society under Registration of Societies Act) with concerned government departments, other stake holders and subject matter specialists for proper and scientific management of the Zoological Park & Safari. The Society shall be under the overall control of the Department of Forest, Government of Tripura. Draft of constitution of the Tripura State Zoo Authority is placed as **Annexure-9**.

Sepahijala Zoological Park and Safari at Sepahijala (Tripura) aims to become a center of excellence for housing unique wild fauna of north-east India and ex-situ conservation of endangered animal species of the region in near future. At the same time, the Zoo shall make sincere efforts to ensure international standards in captive animal welfare and providing world class visitor experience.

To achieve this target, support of various categories of well-trained staff is essentially required to carry forward the vision, mission, objective, and goals of the organization. Personnel planning is the process within an organization ensuring the right number of employees with the required skills to achieve its

strategic targets. It is part of planning and includes the forecast of future personnel requirements, recruitment, and training of employees as well as the management of employee relationship.

Sepahijala Zoological Park and Safari shall be in an area of around 94.90 hectares and is likely to display over 1300 wild animals as per proposed animal collection plan. The Zoological Park & Safari expects around 5 lakh visitors from different walks of life per year. A hierarchy of personal planning of a large category zoo (as per CZA's classification of zoos) has been proposed. This includes administration, animal keeping, veterinary care, sanitation, garden, education, research, commissary, security and maintenance sections. In order to maintain the Zoological Park & Safari and to achieve its objectives, a number of posts have been proposed and some of the works are proposed to be outsourced for their operation. The proposed organizational structure is in line and enough to allow the interlinking of functions, activities, roles, and responsibilities at each level of staff. The proposed staffing pattern is in accordance with the guidelines of the Central Zoo Authority and Recognition of Zoo Rules, 2009. The efforts may not only enhance the zoo management efficiency but also achieve a milestone in the field of captive management of the zoo animals and their welfare.

Sepahijala Zoological Park & Safari shall reframe its organizational structure to recruit experienced staff keeping in view the respective verticals of zoo management which were discussed in chapter 3 (Future Objective). The operation presently is being carried out by meager staff as the total sanctioned/existing posts are not sufficient. Keeping in view some more posts are

proposed in the Master Plan for smooth functioning of the Zoological Park & Safari and providing employment opportunity to public.

The execution of some of the works in the Zoological Park& Safari shall be undertaken by outsourcing to repudiated NGOs/ Private agencies/ Service providers who have sufficient expertise, skill, and trained manpower for executing the works. The services like sanitation in public utility area of the Zoo, Zoo security, maintenance of lawn, gardens, hedges, rest sheds and toilets, refreshment stalls and souvenir shop etc. may be outsourced to get better results. The other works like maintenance of civil structures, water supply network and electrical system could also be done through outsource as and when required.

The detailed organizational chart shall be as given below:

**Department of Forest,  
Government of Tripura**

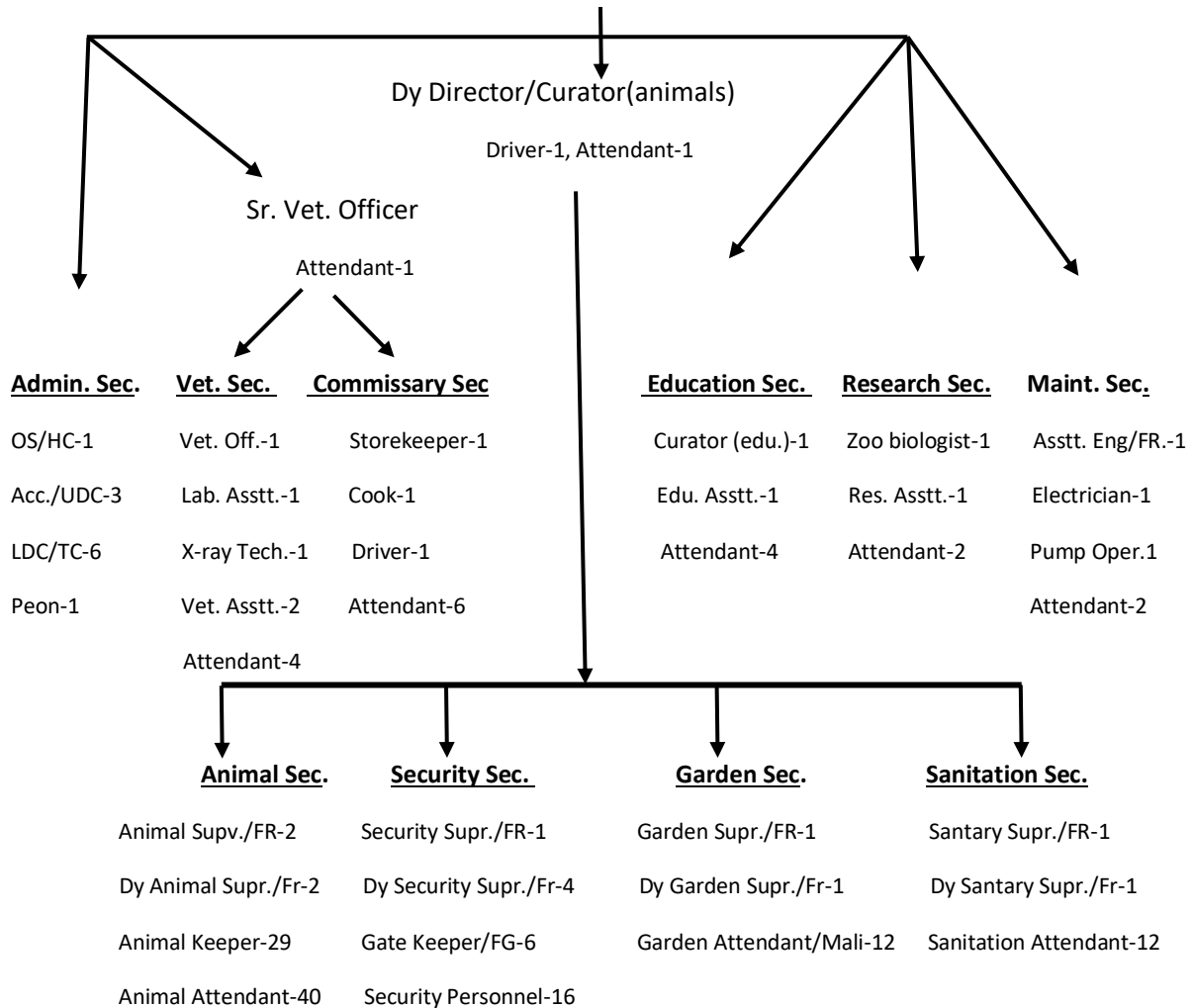
↓  
Tripura State Zoo Authority

↓  
Chief Wildlife Warden, Tripura

↓  
Director,

**Director' Personal Sec.** ← Sepahijala Zoological Park & Safari,

PA-1, Driver-1, Peon-1



Detail of the manpower proposed for Sepahijala Zoological Park and Safari along with existing sanctioned strength and staff in position at present location is proposed to be as given below.

Sl.	Designation	Sanctioned Strength	Existing strength	Proposed posts
1.	Director	01	01	01
2.	Deputy Director/Curator (Animals)	01 (in the rank of FR)	01	01
3.	Senior Veterinary Officer	01	01	01
4.	Veterinary Officer	00	00	01
5.	Curator (Education)	00	00	01
6.	Curator (Research)/Zoo Biologist	00	01	01
7.	Assistant Engineer/FR	00	00	01
8.	Office Superintendent/HC	00	00	01
9.	Animal Supervisor/FR	00	00	02
10.	Security Supervisor/FR	00	00	01
11.	Garden Supervisor/FR	00	00	01
12.	Sanitary Supervisor/FR	00	00	01
13.	Education Assistant	00	00	01
14.	Research Assistant	00	00	01
15.	PA to Director	01	01	01

16.	Accountant/UDC		02	01	03
17.	Storekeeper/UDC		01	01 (Fr)	01
18.	Deputy Supervisor/Fr	Animal	01	01	02
19.	Deputy Supervisor/Fr	Security	01	01	04
20.	Deputy Supervisor/Fr	Garden	00	00	01
21.	Deputy Supervisor/Fr	Sanitary	00	00	01
22.	Lab Assistant		00	00	01
23.	X-Ray Technician		00	00	01
24.	Veterinary Assistant		01	01	02
25.	LDC/Ticket Clerk		04	04	06
26.	Animal Keepers		00	00	30
27.	Cook		00	00	01
28.	Driver		01	01	03
29.	Electrician		00	00	01
30.	Pump Operator		02	02	01
31.	Gate Keeper/FG		04	04	06
32.	Office Peon		02	02	02
33.	Attendants/Zoo Workers		00	62	00
34.	<b>Total</b>		23	85	82
35.	Animal Attendant(Through outsourcing)		00	00	40

36.	Security Personnel (Through outsourcing)	00	00	16
37.	Garden Attendant(Through sourcing)	00	00	12
38.	Sanitation Attendant (Through outsourcing)	00	00	12
39.	Attendant (Through outsourcing)	00	00	20
	<b>Total</b>	<b>23</b>	<b>85</b>	<b>182</b>

## 5.2 Proposed Staff position

### 5.2.1 Director

An officer of the Indian Forest Service (IFS) of the rank of CF/DCF.

### 5.2.2 Deputy Director/Curator (Animals)

An officer of the Indian Forest Service/Tripura Forest Service of the rank of DCF/ACF.

### 5.2.3 Animal Section

Sl. No.	Post	No. of post	Qualification
1	Animal Supervisor/FR	Two	Forest Range Officer
2	Deputy Animal Supervisors/Fr	two	Deputy Forest Range Officers or on promotion from Animal keepers
3	Animal Keepers	Twenty-nine	Matriculate with experience of handling wild animals in captivity

4	Animal Attendants	Forty	On contract
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#### 5.2.4 Veterinary Section

Sl. No.	Post	No. of post	Qualification required
1	Senior Veterinary Officer (Medicine/Surgery)	One	BVSc/MVSc with experience of treating wild animals in wild or in captivity
2	Veterinary Officer (Pathology)	One	Same as above
3	Laboratory Technician	One	Diploma of the relevant field
4	X-Ray Technician	One	Diploma of the relevant field
6	Veterinary Assistant	two	Diploma in Veterinary Science
6	Animal Keeper	One	Matriculate with experience of handling wildlife in captivity
7	Attendants	Six	On contract

#### 5.2.5 Commissary Section

Sl. No.	Post	No. of post	Pay Scale
1	Storekeeper	One	Of UDC rank
2	Cook	One	Matriculate with experience of the field
3	Driver	One	Matriculate with experience of the field

4	Attendants	Six	On contract
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### 5.2.6 Sanitation Section

Sl. No.	Post	No. of post	Pay Scale
1	Sanitary Supervisor/FR	One	Forest Range Officer
2	Deputy Sanitary Supervisor/Fr	One	Deputy Forest Range Officer
3	Sanitation Personnel	Twelve	On contract

### 5.2.7 Security Section

Sl. No.	Post	No. of post	Pay Scale
1	Security Supervisor/FR	One	Forest Range Officer
2	Deputy Security Supervisors/Fr	Four	Deputy Forest Range Officers
3	Gate Keeper/Ticket checkers	Six	Forest Guards
4	Security Personnel	Sixteen	On contract

### 5.2.8 Garden Section

Sl. No.	Post	No. of post	Pay Scale
1	Garden Supervisor/FR	One	Forest Range Officer
2	Deputy Garden Supervisor/Fr	One	Deputy Forest Range Officer

3	Mali	twelve	On contract
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### 5.2.9 Administration Section

Sl. No.	Post	No. of post	Pay Scale
1	Office Superintendent/HC	One	Promotion from Accountant/UDC
2	PA to the Director	One	
3	Accountant/Upper Division Clerks	Three	
6	Lower Division Clerks	Four	
7	Ticket Clerks	Two	
8	Driver	Two	
9	Dakwala/Office Peon/Attendants	Three	On contract

### 5.2.10 Maintenance Section

Sl. No.	Post	No. of post	Pay Scale
1	Assistant Engineer (Civil)	One	On deputation from PWD/Tripura or ACF/Forest Range Officer
2	Electrician	One	
3	Pump Operator	One	
4	Attendant	Three	On contract

### 5.2.11 Education Section

Sl. No.	Post	No. of post	Pay Scale
1	Curator (Education)	One	On promotion
2	Education Assistant	One	B Sc with Biology/Wildlife Science and B Ed
3	Attendants	Four	On contract

### 5.2.12 Research Section

Sl. No.	Post	No. of post	Pay Scale
1	Zoo Biologist	One	On promotion
2	Research Assistant	One	M Sc Zoology/Wildlife Science
3	Attendants	Two	On contract

## 5.3 Outsourcing

The following services will be outsourced:

- i. Sanitation: Through 12 number sanitation attendants (cleaning and sweeping of roads, foot paths, buildings, cleaning of toilets and water points, collection of garbage, leftover, dry leaves, grasses and their disposal, cleaning benches, shelter and signages, mosquito/rodent and fly control and any other sanitation works).
- ii. Garden: Through 12 number garden (mali) attendants (Development and maintenance of lawns, landscaping, plantation and nursery, pruning and cleaning of hedges, trees, preparation and maintenance of earthen

- pots, watering, sprinkling and manuring of lawns, hedges, trees and seedlings, collection of seeds, preparation of manure and other horticulture works).
- iii. Security: Through 16 number security personnel(patrolling of the Zoo area, maintenance of law and order, frisking, control of entry of stray animals, duty at office and gates and other security related works).
  - iv. Cafeteria, kiosks and souvenir shops – on lease.
  - v. Parking – on lease.
  - vi. Cloak room – on lease.
  - vii. E-vehicles – outsourced

#### **5.4 Manpower on contract**

Lab. technician, X-ray technician, computer operators, Librarian, Truck driver, drivers, attendants, peons, black smith, welder, plumber, mason, carpenter, painter, etc.

## Chapter – 6

### 6.1 Disaster Management

'Disaster' means a catastrophe, mishap, calamity, or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or suffering or damage to, and destruction of property or damage to or degradation of environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area. Disasters are serious disruptions to the functioning of a community that exceeds its capacity to cope using its resources necessitating a request to state, national or international level for external assistance.

Disaster Management can be defined as the organization and management of resources and responsibilities for dealing with all aspects of emergencies, in particular preparedness, response, and recovery to lessen the impact of disasters. As per The Disaster Management Act, 2005 'Disaster Management' means a continuous and integrated process of planning, organizing, coordinating, and implementing measures which are necessary or expedient for

1. Prevention of danger or threat of any disaster.
2. Mitigation or reduction of risk of any disasters or its severity or consequences.
3. Capacity-building.
4. Preparedness to deal with any threatening disaster-like situation or disasters.
5. Prompt response to any threatening disaster-like situation or disasters.

6. Assessing the severity or magnitude of effects of any Disasters.
7. Evacuation, rescue, and relief.
8. Rehabilitation and rescue.

Zoos worldwide are susceptible to several hazards. A hazard is a rare or extreme natural or human made event that threatens to adversely affect life, property, or activity to the extent of causing disaster. Hazards may be in the form of floods, cyclones, earthquakes, landslides, heavy snow and extreme weather conditions, volcanic eruptions, tsunamis etc. of natural origin. The other manmade origin hazards include fire, epidemics and pandemics, animal escapes, civil disturbances, technological and biological hazards etc. These hazards are bound to take place and every zoo is vulnerable to these hazards. The institutions should have the capacity to deal with these hazards. So, every zoo must have a comprehensive disaster management plan to deal with such exigent situations systematically and efficiently.

Many threatening conditions like fire, flood, drought, cold and many other seasonal variations, outbreak of epidemic diseases, entry of stray animals inside the zoo or escapes of zoo animals etc. may require a rapid and organized response to minimize injury to people and animals or damage to facilities. Resources and equipment to clean up after catastrophic incidences need to be directed to the community, as zoos are considered a low priority unless they present a threat to the community. Portable generators, chainsaws, gasoline, fresh water, and an adequate supply of foodstuff should always be maintained by the zoo. The Zoo staff may be needed around the clock to deal with problems occurring during severe weather. Normal access to the Zoo may be limited or cut

off due to flooding, downed trees, or damaged roadways. The animals should be provided with heating and blankets in case of extreme cold in the area. It's always good to know that all zoos recognized by the Central Zoo Authority have a risk management plan in place for the animals. Every year these zoos must also perform at least four preparedness drills for emergencies like weather events, fires, and other disasters. Zoos and aquariums must maintain functional fire protection and life support system equipment for animals. The same should also be opted in the entire Zoo premises.

Keeping in view the "Checklist for Master Plan Submission" of the Central Zoo Authority (Zoos in India, 2014), a brief overview of some of the expected potential hazards to the Sepahijala Zoological Park & Safari are indicated and discussed below:

#### **6.1.1 Fire Control**

The Sepahijala Zoological Park & Safari is surrounded by chain-link fence all along the periphery, however, the Zoo has densely natural vegetation all around. The possible hazards like dry leaves, litter and bushes shall regularly be cleaned and disposed of off-site. The long tree branches from both sides of the boundary fence shall be regularly pruned. A wide path clear of vegetation shall be created all along the boundary fence which shall acts as a fire controlling line. Although water tanks are in place, additional locations shall be identified and accordingly, enough water tanks shall be placed in all suitable places. Adequate alarms and fire extinguishers shall also be installed at all animal enclosures and other buildings as a security measure from fire.

The Park & Safari roads and other smaller loops are also being so designed that these should also act as fire control lines. Further, fire prone areas shall be well covered with fire hydrants. During the summer season, the Zoo shall also have arrangements for fire watchers to monitor the occurrence of any fire incident in the Zoo area, especially in green forested areas. Modern firefighting equipment shall be installed in the Zoo premises. Adequate training will be imparted to the Zoo staff to combat fire including mock drills.

The fire management SOP shall be finalized and be in place. A situation of fire in an animal facility requires quick thinking and discretionary judgment on the part of the employee discovering the problem. The discoverer shall soon inform the higher authorities and the person trained shall use fire extinguishers and other measures to control the fire. At the same time, the nearest fire department shall be informed immediately, and the electrician of the Zoo shall also be directed with other appropriate Zoo staff/ personnel to reach and assist at the scene. The public shall be evacuated from the area and if the fire is within an animal facility, attempts shall be made to remove the animals immediately to a safer place with due precautions of animal escape. The electric circuit breakers in the affected area shall also be turned off.

### **6.1.2 Floods**

There is no history of flood like situation in the Zoological Park, as the Zoo is in a landscape with higher elevation compared to the surrounding area which protects it from seasonal flooding due to heavy rains. There is a downward existing natural lake adjacent to the Zoo with a natural slope flowing riverine. The enclosures are also constructed and located on relatively higher ground providing no space for

water to drape. Small hillocks are to be provided in each enclosure. In case of extreme floods, the animals would be shifted to safer areas in cages and fed till the flood waters recede. Further, water drainage has also been constructed as per the need and is well channelized.

### **6.1.3 Cyclone situation**

The Zoo site has no history of any strong cyclonic storms in the past. However, the chances of such calamities cannot be overlooked and ignored. Cyclones can strike at once without any forewarning. Given this, it is always better that advance precautionary measures should be made to minimize damages. There is forewarning time remaining in case of a cyclone and storm and action shall be taken to save animals by taking as many animals as possible from their paddock area to inside the feeding cells. The night shelter for the animals shall be constructed with high-quality material and are safe distance from the trees that protect the animals in all weather conditions. The present enclosures are sturdy and protective enough to provide safety for the inhabitants during the duress of Nature. Further, the electric supply shall be immediately switched off at once from a master control system. The power supply will be through a shielded underground cable system that is well-mapped so that repair and maintenance are done conveniently. To prepare the staff for proper response in such situations capacity building programs shall be organized and their readiness tested through regular mock drills.

### **6.1.4 Law and Order Breakdown**

Law and order breakdown is a major concern for any zoo involving a high number of captive animals and visitors at the same time. In the event of a major law and

order collapse, the zoo must be evacuated of all visitors immediately. The main gate of the Zoo will be closed and the help of the concerned administrative authorities, police, etc. shall be taken to bring the situation to normal. The Zoo shall be closed till conditions are restored to normalcy. The Zoo staff and Security shall be employed round the clock, during such a crisis, to guard the precious life forms in the Zoo. Technology-enabled surveillance (CCTV Cameras, wireless communication etc.) should be taken into consideration. A database of phone numbers of the nearest police stations, fire brigade, ambulance, nearest hospital and concerned Zoo staff will be displayed at important locations in the Zoo.

### **6.1.5 Feed Supply**

Feed management is the utmost priority of a zoo. Procurement of species-specific feed and storing the same is a challenging task. The Zoo has a tendering process for the procurement of feed and sign an MoU with the related organization/s for the regular and emergency delivery of feed. There is a storeroom in the kitchen to store adequate storable food ingredients. Furthermore, the food items will be stored above ground and the storage will have sufficient ventilation and sunlight. A deep fridge shall be procured to store perishable items. The Zoo will have a contingency plan for dealing with exigency associated with feed supply. The contingency plan also envisages the cleaning and sanitizing the food items to eliminate pathogens. Similarly, preventive measures will be taken to cope with contamination of the drinking water supply by identifying alternative sources of water and mobilizing water tankers.

### **6.1.6 Other situations**

#### **6.1.6.1 Earthquake**

In case of an earthquake in the area, the physical barriers keeping the wild animals under captive conditions may dash to the ground. The boundary fence, enclosure barriers, or even the interlink chain fence with the uprooting of the trees or the other structures will be affected. This may cause heavy damage to

inmates though it cannot be avoided. The animals may get buried under debris or may escape. Keeping in view, all the construction undertaken in the Zoo shall be earthquake resistant. The staff shall be trained to deal with such situations. The staff should rush out of the buildings as soon as tremors are felt and shall be instructed to protect the animals safely and immediately. Animals roaming free in their large enclosures area will suffer minimal impact in case of an earthquake. Therefore, for most of the time except for feeding or some other unavoidable reasons, the animals will be kept in large enclosures rather than keeping them confined in cages. The physical barriers will have to be designed by keeping in mind such natural calamities. The rescue squad is to be trained to deal with situations and mock training be carried out. The announcement speakers are to be placed at suitable places for declaring emergencies and guiding the visitors to a safer place.

Further, as recommended by the National Disaster Management Authority following steps should be taken into consideration:

Before	During	After
Consult a structural engineer to make the enclosure and other buildings	Stay calm and do not panic	Avoid entering damaged buildings
Repair deep plaster cracks on walls and	Drop under a table: cover your head with	If trapped in rubble: - Do not light a

ceilings	one hand and hold the table till the tremors last	matchstick - Cover your mouth with a cloth - Tap on a pipe or wall - Sound a whistle - Shout only a last resort
Fastens shelves securely to walls, place heavy/ large objects on lower shelves	Run outside as soon as the tremors stop	Use stairs and not lifts or elevators
Have an emergency kit ready	When outside move away from buildings, trees, walls and poles	
Develop an emergency plan for the family	When inside a vehicle – pull over in an open place and remain inside, avoid bridges.	
Learn the techniques of Drop-Cover-Hold.		

#### **6.1.6.2 Civil disturbances**

Civil disturbances could happen at any given time in a zoo. It is very important that arrangements be made to send the zoo visitors and the staff safely to safer areas during such disturbances. It is very important to evacuate zoo visitors to safer areas on a priority basis. To stop such panic in an organized way becomes more imminent as such panic may result in further injuries if people attempt to evacuate in a disorganized manner. The first-aid kit shall be maintained at various locations in Zoos and first aid will be given who get injured.

#### **6.1.6.3 Bomb threat**

There is no history of bomb threats in the past in the Zoo. The nearby people of the state and visitors are very peaceful and cooperative. However, bomb threats could not be ignored whenever such information comes to zoo management. Such threats should be immediately referred to the law enforcement agencies having jurisdiction in the area. The Zoo staff shall be trained to follow the evacuation procedure/ plan for a fire, flood, cyclone, etc. except all radio communications in the area should cease immediately. Visitors overhearing conversation concerning a bomb threat can panic, creating yet another problem, this should be addressed immediately. It shall be ensured that there is no damage to Zoo inmates, visitors, and staff.

#### **6.1.7 Strategies to deal with such situations and required equipment**

All zoos should have meticulous prior planning and preparedness to face such exigencies in the interest of zoo animals as well as public safety. The Zoo shall also have financial planning with an adequate budget to deal with such natural calamities.

Following is the list of minimum types of equipment (including present status at the zoo) needed to deal with such situations:

<b>Sl.</b>	<b>Equipment</b>	<b>Essentially required</b>	<b>Present at Zoo</b>	<b>To be procured</b>
1.	Tranquilizing gun with drugs	Yes	Yes	Nil
2.	Alarm systems	Yes	Nil	Yes
3.	Public address system	Yes	Nil	Yes
4.	Ropes and nets	Yes	Yes	Yes
5.	Gas cutters	Yes	Yes	Yes
6.	Earthmoving equipment	Yes	Nil	Yes
7.	Fireproof dress	Yes	Nil	Yes
8.	Rubber boots	Yes	Yes	Nil
9.	Protective gloves	Yes	Nil	Yes
10.	Helmet	Yes	Nil	Yes
11.	Radio communications like walkie talkie, mobile etc.	Yes	Yes	Nil
12.	Pick axe	Yes	Yes	Nil

13.	Measuring tape	Yes	Yes	Nil
14.	Shovels	Yes	Yes	Yes
15.	Welding machine with sufficient welding rods	Yes	Nil	Yes
16.	Cages	Yes	Yes	Yes
17.	Construction and repair material (Cement, iron rods, sand etc.)	Yes	Yes	Yes
18.	Goggles	Yes	Nil	Yes

#### **6.1.7.1 Local Response Capabilities**

A local disaster management team/quick response team can play a crucial role in managing such situations effectively. The Zoo shall ensure a trained designated disaster management team/quick response team that is always on standby to handle and manage exigencies. The regular training program with mock drills will be organized for the team with a focus on identifying and responding to exigencies within the shortest possible time to ensure early mitigation of all possible threats.

The Zoo has the contact numbers of the nearest police station, fire and rescue service station, and the nearest Government hospital to deal with any emergencies. They shall be contacted immediately during such a situation to carry

out the operation. Periodic meetings shall also be convened to discuss the preparedness of such situations.

## **Chapter – 7**

### **7.1 Contingency Plan**

A contingency plan is a course of action designed to help an organization respond effectively to a significant future incident, event, or situation that may or may not happen. A contingency plan is a plan devised for an outcome other than the usual expected plan or activity undertaken to ensure that proper and immediate follow-up steps will be taken by management and staff in an emergency. Contingency planning is a component of business continuity, disaster recovery and risk management. The major objectives of a contingency plan are to ensure containment of damage or injury to, or loss of, personnel and property, and continuity of the key operations of the organization.

The Zoo is an organization housing many live animals out of which many belong to endangered categories of species and sufficient staff work to take care of and fulfill the day-to-day needs of these animals. The Zoo animals are susceptible to diseases, and so are the Zoo employees working with these animals. Hence, it is very much needed for zoos that they should have a well-documented technical contingency plan for specific and high-priority animal diseases. Problems are manifold and may arise due to one reason or another, so it is mandatory to have contingency plan to cater to such situations including resource and financial plans.

### **7.2 Animals rescued from the wild**

As per the National Zoo Policy, 1998, the Sepahijala Zoological Park & Safari shall also act as a rescue and rehabilitation center for the treatment and scientific upkeep of rescued animals by providing appropriate housing facilities for the

species generally rescued from the region. In the case of rescued animals or animals brought through an animal exchange program, the Zoo shall be equipped with an appropriate quarantine facility. Such animals shall be examined thoroughly, and necessary treatment shall be given immediately. Blood samples shall be tested for further examination and treatment shall be provided to animals, accordingly. If the animal has minor injury and sickness, primary treatment shall be provided, and the best possible option is that the rescued animal shall be released/relocated to its natural habitat. On the other hand, if the animal has grievous injuries or is seriously sick regular treatment shall be given and the animal shall be kept in quarantine or temporary rescue facility for a period of minimum one month and shall/may be released back in the wild, while the exchanged animals shall be shifted release to the identified animal enclosure. The animals that were not suitable for release into the wild habitat should be kept/housed at the long-term off display rescue center. The rescue center has been designed to reduce and manage human-animal conflict in the region.

### **7.3 Escape of animals from enclosure**

The Zoo shall ensure that enclosures of various animals housed at the Zoo are safe for animals and visitors. The animal enclosures would be designed as per the prescribed norms and guidelines of the Central Zoo Authority in this regard. Further, the entire Zoo has been protected by a chain link fence of 2.5 meters height all around. There may be little chance of animals escaping from enclosures. Animals can still escape due to the carelessness of the staff or due to some other causes. The Zoo staff have been instructed to conduct thorough checking of animal enclosures on a regular basis to avoid any such escape. The animal keepers

of each enclosure thoroughly check the fence of the enclosure, moat of the enclosure, public exhibit areas, night shelter rooms, doors, and service areas before releasing the animals in the day exhibit and after bringing them back to the night shelter. The Zoo always keeps public safety as its utmost priority. The escaped animal may cause heavy damage in terms of the injuries/ fatalities to the Zoo visitors/ employee or and even loss of the wild animals. The following precaution and action that may bring relief in such case are being followed at the Zoo:

- i. The animal keepers and staff of the Zoo have been sensitized about the issue of the seriousness of animal escape. This shall further be done by educating on such issues during animal keeper's training programs or often during interactions with the technical staff of the Zoo at regular intervals.
- ii. The trees in and around the animal enclosures are trimmed to keep them in such shape that they do not provide any support/ base for the escape of animals. A similar practice of trimming big trees and clearing shrubs/ bushes shall also be taken up on either side of the boundary fence to avoid the escape/ entry of any wild animal.
- iii. Water in the wet moated enclosures is maintained to a level so that the animals housed in these wet moats can't cross the barrier.
- iv. The gates, doors, and windows of the night shelters are maintained in such a way to contain animals within enclosures. These are also repaired whenever required and periodically painted to avoid rusting which could otherwise make them weak as barriers. The gates and doors to the

enclosures are strong enough, and effective in containing the animals, as the rest of the enclosure barriers.

- v. Installation of alarm systems throughout the Zoo and Rescue Center campus will be done to alert the visitors and staff in case of any such problem.

When it is determined that an animal is not in its enclosure, time is the most influential factor affecting its re-capture and possible survival. Attempts to contact supervisory personnel, all the animal keeper staff, and the veterinarian shall also be made immediately, but voice messages are acceptable. If necessary, contact of district administration/ police will be made by the supervisory personnel. If any other animal/animals, is/are still in the enclosure, immediate effort by the keeper will be made to determine if the escape was by means that could afford escape for other animals. If possible, to do so, the escape route shall be closed off with whatever means is available until assistance arrives.

The escaped animal may still be within the perimeter fence or nearby outside, so disturbance in the area should be minimized. A kit including a tranquilizing gun and all accessories and medicines always kept standby at the veterinary facility and sincere effort for capture of the escaped animal are taken by field team personnel using the most appropriate means at their discretion. It has also been recognized that escaped animals often try to return to their habitats, fearing the unknown environment they suddenly find themselves in. So, using fruit/ eatable things or through other measures, animal keepers try to lure the animal back to his enclosure. If, the plan to lure the animal quietly back to its enclosure fails, finally, the rescue squad swing into action with tranquilizing equipment, drugs,

pole syringes, projectile guns, and darts, blow dart equipment, nets, snare, crates, capture and squeeze cages, forks, bags, plastic tubes, snake tongs etc. The Zoo's Animal Care Team/ Rescue Team meet periodically to discuss animal emergencies. At the Zoo, plans shall be updated as needed and shall be revisited after each incident. In addition, the Zoo shall conduct annual emergency exercises relative to the needs of the facility and its physical location. The Zoo shall also install access control and alarm systems throughout the various buildings and animal enclosures. There are more expected security-driven issues, like placement and feasibility of CCTV cameras, emergency ring-down phones, intercom, or digital displays, etc. and shall be taken care of accordingly.

#### **7.4 Monkey and dog menace**

The Monkey & dog menace is a big problem for the zoo management, especially the zoos which are situated near the forest area or in a highly monkey populated area. So, to overcome this problem various solutions & suggestions would be practiced.

Both dogs and monkeys in and around the Zoo are a cause of concern as pose a great threat not only to the visitors but also to the animal collections of the Zoo as they create a nuisance and may harbour diseases that may be harmful to visitors and inmates at the zoo.

The dogs that enter the Zoo can cause havoc among the visitor, free-ranging animals and if they happen to enter the enclosures of deer/ antelope it will result in heavy losses of Zoo animals. At the same time, monkeys may also feed on the

food being served to Zoo animals. Both these animals may also transmit diseases to the Zoo animals.

The Zoo has been protected by a boundary fence with chain link net. The fence along the boundary will prevent the entry of domestic and pet animals. Lopping and trimming of the branches on either side of the Zoo boundary proves helpful in checking the jumping of monkeys inside enclosures from the trees. The visitor entry gate has also been designed so that it should not provide sufficient space in-between to enter such animals inside the Zoo premises. However, it may not restrict the entry of wild animals like monkeys which may easily overpass the chain link fence barrier. The Zoo has adopted various physical and scientific methods for controlling the monkey menace and dog entry/ feral animals which include the following:

- The boundary fence is checked periodically.
- The watchmen keep a lookout for the stray dogs.
- The dogs that enter the Zoo are captured and released or handed over to animal welfare organizations for rehabilitation.
- The main gates are always guarded by the staff of the Zoo. Visitors are not allowed to feed the monkeys.
- The herbivores/ birds are fed in the covered feeding kraals to avoid the entry of monkeys to share the animal feed.
- In long-term measures such monkeys & stray dogs can be castrated through surgery.

- The monkeys are captured and vasectomy/ tubectomy performed and then released back to check their increase in population or the use of the latest laser techniques will be more economical & convenient.
- Spreading education and awareness to the people not to throw eatables outside houses, hostels, restaurants, and hotels, etc. shall also be helpful in overcoming the problem because eatables materials attract monkeys and dogs both, and it affects directly to change their food habits and habitat.

### **7.5 Arrangement of food in case of strike (non-supply by contractor)**

The supply of feed items for the captive animals of the Zoo may get affected by natural calamities, public strikes, non-supply of the contractor, road network problems due to construction work, vehicle breakdown, lock down etc. In these circumstances, it is essential to get the required feed items to feed the Zoo animals. So, it is always necessary to maintain sufficient feeding stock for at least a week. Both the perishable and non-perishable food items are to be stored in the commissary storerooms. The non-perishable items may provide stock for a long time while the perishable items may be helpful to meet the requirement on a short-term basis. The Zoo shall make appropriate arrangements to store both perishable and non-perishable food items. The non-perishable food shall be stored in a sufficient size store, and it shall be moisture-free, and have platforms, pest and rodent-free, while perishable food items shall be stored in a deep fridge.

The strategy of the Zoo in such circumstances is to maintain and store items of food grains etc., in stock for at least 15 days and efforts should be made to stock greens, vegetables and meat for at least 7 days by providing a deep fridge during strikes. If food materials are not supplied by contractors, food materials shall be

purchased from the local market directly by the management. Similarly, there are arrangements for storage of water for at least 7 days on the overhead water tanks or alternate arrangements. The Zoo shall in the future make efforts to increase the water storage capacity to fifteen days.

### **7.6 Snake Bite**

The Zoo is visited by large numbers of visitors and there are chances of snake bites. To avoid such an eventuality and to deal with such situations the Zoo has strategically divided the subject into 2 parts as follows:

- a) **Preventive measures:** -For prevention of such instances, the Zoo has been providing gum boots to the caretakers/animal keepers, especially in rainy season and those who are working in the enclosures and visitors are made aware by interpretation and warning sign boards.
- b) **Therapeutic measures:-** Enough Polyvalent - anti-venom serum is stocked and is available at the Zoo. Further, doctors are available at nearby hospitals to treat snake bite patients in an emergency round the clock. Vehicles are readily available to transport the victim to the nearest hospital for proper treatment and care.
- c) Local government hospitals will be kept on high alert to respond to any SOS call from the rescue center in case of emergency.

### **7.7 Visitors getting injured/ visitors falling inside enclosure:**

Although there are not many chances of injury to the visitor in the Zoo, but still the visitor may get injured, either by falling on the hard ground surface while walking, or any small accident or overlooking the forbidding instructions or due to

other problems etc. In such cases, if any visitor gets injured, are provided first aid at the Zoo and staff has also been trained in first aid treatment. If the injury is of a grievous nature, the injured visitor is advised and facilitated to go to a nearby hospital.

The enclosures are safe for visitors and for zoo staff. However, there are still chances of falling a visitor in the animal enclosure accidentally or during vandalism etc. If any person/ visitors fall inside the enclosure, efforts are made to keep away the animal/ animals from the fallen visitors with the help of water shower, fire cracks/ making noise etc. and fallen visitor lifted by using a foldable ladder and rope immediately. The immobilization of animals shall also be done if necessary. Any visitor who gets injured is also given first aid maintained in the Zoo.

The Zoo shall strengthen protocol and procedures by working closely with the neighborhood police for security along the perimeter. Security shall also operate a CCTV system with cameras throughout the Zoo, security officers shall be monitoring activities to prevent undesirable behavior, such as visitors throwing objects into animal exhibits and children climbing on fences to get a better view of the animals. The Zoo has a children's education program through which is able to instruct its younger visitors about how to behave around the animals.

### **7.8 In-fighting among animals**

In-fighting for territory or during breeding season is common in wild animals. However, such a situation should be avoided in the captive animals housed in zoos. In case, whenever animal fights take place, efforts shall be made to separate

the fighting animals without causing serious injuries. It should be done immediately by using water jets/showers, firecrackers and shouting etc. The fighting animals will be driven back to the night shelter (primates and carnivores) and kraals (herbivores) to avoid further fighting. In felids only those animals that are compatible are released together in the public exhibit. If needed, the animals will be chemically immobilized and brought back to the night shelter. In case of herbivores during the breeding seasons, animals would be watched carefully, and precaution shall be taken by segregating the male animals. If any animals are found injured, necessary treatment is provided immediately.

### **7.9 Epidemics**

There are several diseases that are prevalent in Zoo animals. It is very important to understand and study the animals regarding the symptoms of their disease, especially infectious diseases. It is very important that diseases including infectious diseases should be diagnosed at an early stage & treated well in time and other preventive measures are applied to other animals. But the more important is prevention than cure.

Sepahijala Zoological Park has a detailed healthcare protocol for the common diseases affecting wild animals. The Zoo follows regular vaccination and deworming and disinfection as prophylactic measures. There is a need to do a coprological examination as per the schedule developed by the veterinarian. The visitors are allowed into the Zoo through a foot bath developed at the entry gate. The entry of domestic livestock and pet animals is prohibited in the Zoo premises. The vaccination of domestic livestock and pet animals in the surrounding villages against common contagious diseases with the help of the State Animal Husbandry

Department could be taken up as long-term measure for any epidemics. Animal keepers are instructed to follow the precautions to avoid any outbreak of disease to susceptible animals. The health checkup of the animal keeper is also being done once annually.

Further, following suggestions can be implanted in the Zoo to overcome the epidemics:

- a) The regular vaccination against the infectious disease like Rabies, B.Q., F.M.D., Anthrax, Trypanosomiasis, I.B.D., R.D. and H.S. is advisable.
- b) Regular maintenance of hygiene & sanitation through using various disinfectants in the animal cage & sheds is necessary.
- c) During the vaccination or in the phase of onset of any infectious disease the movement of staff & visitors shall be controlled as per technical guidelines.
- d) There shall be special dress of the workers/ handlers inside the Zoo which shall be properly sterilized & kept in a particular place to avoid contamination & transmission of disease.
- e) For different cages and sections, the staff shall not be the same, because they do work as carriers and spread the disease organism from one shed to another.
- f) Enough utensils/ equipment required during vaccination & sanitation process shall be available. The unavailability of required utensils/ equipment can cause big loss in preventive processes.
- g) The disinfection process is used in individual enclosures also to reduce the load of disease-causing agents, which are carried by the visitors.

- h) Foot dip/ Motor dip/ Foot dust is used in various junctions of Zoo routes & at entrance of each section of the animal cage or shelter.
- i) Regular fumigation and disinfectant spray in the night shelter & surroundings may be the best process to reduce the pathogenic load.
- j) Weeds shall be removed from each animal's enclosure before the onset of rainy season to reduce vector load.

### **7.10 Breakdown of power supply**

The Zoo shall install noiseless electric generators to provide emergency power backup. The electric generators will be based on the concept of renewal/ green sources of renewable energy. The electricity invertors shall be provided to operate small instruments during the break of the power supply in an eco-friendly/ noiseless manner. The automatic generator sets shall be installed for the substitute to operate, other ones like incinerators, auto clothes, and other veterinary equipment. The Zoo also has plans soon to install solar panels as a green source of energy and for self-sustainability. This will also help in reducing carbon footprints and achieving the goal of reversing the red i.e. climate change.

### **7.11 Free ranging animals/ Feral animal menace**

The Standard Operating Procedure (SOP) recommended by the Central Zoo Authority or any other related organization like WAZA should be followed while dealing with such situations.

### **7.12 Emergency Unit**

The first step to dealing with the various consequences that arise out from any natural or manmade emergency, the Zoo shall have a well-trained Emergency

Unit (EU) formed for each animal holding and visitor facility. The team shall be so trained that each member clearly knows exactly what his/ her role is during any emergency in the Zoo. A well-executive plan with written instructions shall be prepared and shall be applicable to each employee for the proper functioning of the team. The plan shall include whom to report on and extraordinary duties in emergency work within the Emergency Unit (EU). The possibility of emergency (an escape of animal, a bomb threat, mob fury, flooding, severe storm, earthquake etc.) should cause the team to come into operation in planned manner.

## Chapter – 8

### 8.1 Capacity Building

Capacity building is defined as the process of developing and strengthening the skills, instincts, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world. Capacity building or capacity development is the process by which individuals and organizations obtain, improve, and retain the skills, knowledge, tools, equipment, and other resources needed to do their jobs competently or to a greater capacity (larger scale, larger audience, larger impact, etc.). Capacity building and capacity development are often used interchangeably.

For a zoo to function on par with global standards in terms of management and animal welfare standards, it is important to have skilled and technical staff across all verticals. So, it is important to assess the mental and physical capacity of the staff working in the Zoo. Their optimum efficiency in work shall be utilized to assign them duties to carry out day-to-day work to achieve the objective of Zoo management. In a zoo, a few staff members are older, and a few are new. Both categories of staff shall require exposure to the activities of zoo management as per their needs along with every level of the zoo staff. This shall help in the smooth functioning of carrying out their assigned tasks/duties by the animal care, veterinary, education, biologist, animal keeper, and other staff.

This objective can be achieved by ensuring constant upgradation of knowledge and technical skills of the Zoo staff from time to time in a periodical manner. Accordingly, the Sepahijala Zoological Park and Safari shall provide the opportunity to its staff to be upskilled and trained as per current standards by organizing

training/ workshop/ seminars for various levels of staff or by deputing the staff in various related capacity building programs organized by other professional organizations/ agencies. The staff shall get the opportunity to know and understand the new methods, innovative technologies, and findings regarding the management of Zoo inmates, health and upkeep of animals, nutritional enrichment, species specific animal enrichment, animal behavior, animal capture, and handling, record keeping, interpretation techniques and awareness skills, maintenance of hygiene etc. The training regarding the upgradation of international and National Policies, rules, and regulations pertaining to animals in captivity and the Wildlife Protection Act and other related Guidelines shall also be useful at the managerial/ administration level.

Capacity Building needs of the different categories of staff shall be assessed and accordingly, the education and skill development module shall be designed. The expert agency/ organization shall be identified for the upgradation of their skill and knowledge as per the requirement of the different categories/levels of staff. These programs shall be organized at the Zoo level, state level, national or international level. The various level Zoo staff shall also be encouraged to undertake exchange programmes between zoos to give them the opportunity to be exposed to the new techniques and management skills in vogue in various zoos nationally or internationally. For this purpose, the staff shall be periodically sent to zoological parks in neighboring states/ countries to have in-depth exposure to the best practices in captive animal management issues. The Zoo shall also organize study tours for the staff to facilitate the smooth administration of the Zoo in a manner that study tours shall not impinge on the daily activities of

the Zoo. The staff connected with security shall be adequately trained in disaster management like combat fire, earthquake, accidental animal escape etc. for which the Zoo management shall also organize mock drills periodically.

The Zoo staff shall also be deputed to Capacity Building Programs organized by the Central Zoo Authority and the Wildlife Institute of India, Dehradun. Similarly, In-house training workshops/ conferences/ seminars focusing on captive management, animal care, veterinary science, biology & behaviour, enrichment, nutritional management, education, and awareness etc. and propagation shall be organized in the Zoo at regular intervals.

The Zoo will also make sincere efforts to develop and maintain a comprehensive digital database with a catalog of Zoo management related books, journals, and other publications etc. which can be accessed by the zoo staff for reference.

## **8.2 In house training**

A cursory look at the history and growth of the Sepahijala Zoological park and Safari does indicate the efficient functioning of the Zoo with available competent and experienced staff. Skills acquired are getting transferred to next generation. Documentation and regular demonstration of the skills and knowledge acquired has to be done on regular basis. Therefore, it is proposed to organize training sessions with experienced people for the benefit of youngsters. Group of youngsters would be attached to such senior staff for some time, so that all the fine skills & nuances of animal handling and care could be learnt “on job”. Also, working in groups fosters team spirit and brings out the best out of the ordinary, which is the modus operandi of modern corporate work.

### **8.3 To encourage specialisation and interaction with retired staff**

Tapping the experience of skilled and retired personnel is advantageous to maintain the Zoo in good conditions. By virtue of spending lifetime in animal handling and care, some would develop finite & highly special knowledge about particular animal with respect to behaviour and breeding ability. The Zoo must tap this knowledge and encourage willing personnel among the existing staff to acquire and get expertise in particular group of animal species. It is desirable to elicit the preferences of each person and assign jobs to attain specialization in the field. In this background, it is planned to conduct interactive sessions to select staff with notable retired staff in animal keeping, gardening, security, workshop and veterinary care.

### **8.4 Rewards to staff members**

Motivation is important to sustain the interest of staff members. Therefore, the Zoo shall introduce rewards to staff members recognizing their exemplary services. Cash awards may also be given to the animal keepers and other staff with appreciation certificate. Further it is also proposed to institute awards in on annual basis to the best outstanding contributor, best animal keeper, best gardener and special award respectively.

- Chairperson, TSZA Award
- Vice Chairperson Award
- Director, SZP&S Award

### **8.5 Keepers training programme**

The SepahijalaZoological Park and Safari shall organize keepers training programme from time to time to upgrade their knowledge in the scientific

management of the Park. The themes of the training may include crisis management and zoological park emergencies, enrichment, management of birds/reptiles, etc. The keepers shall be trained to entrust them with higher responsibility.

### **8.6 Administrative training**

The personnel working in Administration Section in the Zoological Park & Safari shall be sent for training to improve their skills. Normally after initial recruitment, they will be working continuously without any opportunity to enhance their skills. Their talents need to be recognized and encouraged for exposure training for the benefit of the Park.

### **8.7 Top level, middle level officers/staff training on Zoological Park & Safari management**

The Wildlife Institute of India and the Central Zoo Authority regularly conduct special and focused trainings and workshops on different aspects of wildlife management and policy. Participation of top-level management of the Zoo is must and essential to upgrade their knowledge to bring about changes and adopt newer techniques as enunciated in National Zoo Policy, 1998, Recognition of Zoo Rules and Guidelines for scientific management of zoos. Regular interaction and opportunity to visit other zoological parks would help to acquire knowledge on different animals, enrichment of enclosure and other aspects of zoological park management such as crowd management and initiation of better visitor facilities etc. It also provides an opportunity to interact with many experts in the field, who shall participate as faculty in the training programme. The Zoological Park & Safari shall take the benefit of the training to have trained officers in the management

for better results.

### **8.8 Training of the Executive Director**

Government should post an officer to work as the Executive Director for at least 5 years and he/she should be exposed for all sort trainings including at least in 2 foreign countries viz. Durrell Wildlife Preservation Trust and in Smithsonian Institute. He/she should also be sent to other zoological parks and related institutions to gain experience and to run the Zoo on scientific lines. They should also be exposed to trainings organised by the Central Zoo Authority or by the Indian Veterinary Research Institute, Bareilly.

### **8.9 Zoological Park Veterinarian's training**

The works of zoo vets are very important from the point of view of the healthcare management of animals. As the Sepahijala Zoological Park and Safari shall house valuable animals and failure to diagnose and not being able to provide treatment in time may lose the valuable animals. The Zooveterinarians shall also be exposed to trainings organised by the Central Zoo Authority and/or by the Indian Veterinary Research Institute, Bareilly.

### **8.10 Park Educators training**

As conservation education is one of the fundamental objectives of the Zoological Park & Safari, the Curator (Education) shall be trained properly to organize training programme for the students, NGO's and Zoological Park.

### **8.11 Zoological Park & Safari volunteers training**

The Zoo volunteers shall also be given orientation training regularly, so that they can assist the Zoological Park & Safari Management in due necessities.

### **8.12 Regional Committee of Experts**

A regional committee of experts constituting leading veterinarians shall be nominated to train the Zoo vets and to assist in handling difficult cases as and when required.

As the staff gets older, they may not be in a position to carry out their assigned functions. They are to be assessed and evaluated regularly and jobs based on their mental and physical capacity may be assigned to them for optimum efficiency in work. The staff has to be protected from exposure to risks in the course of their duty.

The upgradation of the knowledge and skill of the staff is a continuous process. They must get opportunity to know and understand the new methods, technologies and findings regarding the management of animals.

During the course of time the training needs of the different category of staff shall be assessed. Education and skill development module for each category shall be designed and agency/organization shall be identified for up gradation of their skill and knowledge. The exchange programme between Sepahijala Zoological Park and Safari and other zoos shall be encouraged to give them exposure about the new techniques and management skills in vogue in various zoological parks of the country.

## Chapter – 9

### 9.1e-Governance

e-Governance is generally understood as the use of Information and Communication Technology (ICT) at all levels of government, to provide services to the citizens, interaction with business enterprises and communication and exchange of information between different agencies of the government in a speedy, convenient, efficient and transparent manner. The basic purpose of e-governance is to simplify processes and provide convenience, efficiency, transparency & reliability for all, i.e. government, citizens, interaction with business enterprises, and communication and exchange of information between different agencies of the government at national, state, and local levels. The concept of e-governance with government websites came into existence in the late 1990's and is now a reality.

E-governance shall be implemented in the Sepahijala Zoological Park and Safari in a phased manner to improve the efficiency, effectiveness, and consistency of governance. Sepahijala Zoological Park and Safari is already significantly advanced in the information technology sector and has put-up updated basic information about the Zoo on the website of the Department of Forest, Government of Tripura.

At Sepahijala Zoological Park and Safari following are the areas, which generate the need for establishment of e-governance:

- i. Repetitive processing of information manually
- ii. Delays in transfer of information
- iii. Erratic reporting of information
- iv. Lack of standard formats

- v. Non-compliance of the schedules.

While devising the programme at Sepahijala Zoological Park and Safari following thrust areas will be given special attention:

- i. Management aspects related to protection including monitoring of health of the animals kept at the Zoo.
- ii. Information related to establishment matters including deployment of staff.
- iii. Resource inventory including animals housed at Sepahijala Zoological Park and Safari.
- iv. Management planning and perspective planning.
- v. General periodic returns.
- vi. Annual Plan, Budgeting, Monitoring & Evaluation.
- vii. Resource inventory of assets and other equipment.
- viii. Public awareness and tourism activities.
- ix. Documentation of resources.
- x. Environment awareness and education Programmes.
- xi. Inventory and information related to inhabitants around the Zoo.
- xii. Information relating to feed and fodder, animal history cards and animal transfers.

Other matters to be recorded and utilized are:

- Accounts of the Zoological Park & Safari
- Receipt and supply of feed on daily basis
- Visitation record
- Store record

- E-correspondence

To establish and implement the programme functioning smoothly, the action plan will include:

- i. Identification of Information needs at different levels.
- ii. The data source will be identified.
- iii. Standardized format for collecting and recording data will be finalized.
- iv. Communication Network for information transfer and feedback will be established.
- v. Periodicity of data input and transmission of information will be standardized.
- vi. Formats for reporting will be finalized as per the needs of different levels.
- vii. Keepers' diary, daily reports, animal history cards, disinfection schedules, deworming schedules, treatment cards, post-mortem reports are to be maintained regularly. It is expected that happenings in the Zoo should be recorded in these books by care takers, veterinarian and other senior management personals respectively.
- viii. Record of vandalism cases or any other act not commensurate with provisions of Recognition of Zoo Rules, 2009 and Wildlife (Protection) Act, 1972 should be maintained at management level.
- ix. Computer based framework will be used for inventory and management purposes including monitoring and evaluation.
- x. Efficacy of system will be periodically reviewed and the necessary

alterations in the system will be made as per the requirement.

While designing the Management Information System (MIS) following steps shall be taken into consideration by the management:

- i. Basic character of data collected at field level should remain the same.
- ii. Repetition of items of input information should be avoided.
- iii. Format of output data should be kept similar as far as possible.
- iv. Data should be easily accessible.
- v. The programme is to be improved according to needs.

Staff involved in management of the Zoo shall be provided with smart I-cards in which their personal details will be stored. The profile of the staff shall be kept, and database shall be used for future management.

A complete system of hardware & software is felt needed to record all the data generated by animals' section, veterinary section, education section and research section. The Sepahijala Zoological Park and Safari shall join 'Group 360' (earlier known as International Species Information System (ISIS), to be part of global network of Zoological Information Management System (ZIMS).

The Zoo in due course of time shall come up with computerization in all aspects to make it available accurately to store and disseminate the information within and with visitors for better outreach and management. The available technologies such as the internet, website hosting, e-mail, mobile and digital media, etc. shall be considered to reach out to mass media with little expense in real time. This effort shall not only deliver the services faster but also bring more transparency between the government and the citizens.

Important information and updates shall be uploaded on a day-to-day basis for the public convenience and to create awareness. All the computers in the Zoo will be networked to form a Local Area Network (LAN) and an internet connection will be given so that the documents can be accessed from any computer. Visitors to the Zoo will have important related information like animals housed at the Zoo and their behavior, ticket price, day-to-day programs of the Zoo for visitors, direction map to reach the Zoo, etc. from their homes using the website.

For the booking of tickets from anywhere in real time, it shall be ensured to integrate the facility of e-ticketing into the website. It will facilitate the visitors and help in decongestion/ long queue at the entrance plaza. At the same time for visitors not well versed with the recent advances in technology, self-ticketing kiosks, and chatbot-driven ticketing should also be made available and shall be made dysfunctional in due course of time. Automated electronic entry gates will be installed in the Zoo with each visitor will be issued with a bar-coded ticket for entering through any of the electronic gates which will also provide accuracy for an exact figure of adults, children, foreigners, etc. visitor entry statistics and lead to revenue transparency.

Similarly, for promoting Mobile governance (m-governance) for an integrated platform for delivery of government services to citizens over mobile devices using SMS, USSD, IVRS, CBS, LBS, or mobile applications installed on mobile phones, a mobile based application shall be developed so that the users can access information related to e-ticketing, adoption service, grievance, tender, news and information about the Zoo, scanning bar code information about captive animals, the exact location of the animal inside the Zoo, amenities and contact number of

Zoo officials etc. Light-emitting diode (LED) display screen will also be installed to ensure dissemination of information to the visitors. Security staff will allow the visitors to ensure valid tickets.

The Closed-Circuit Television Vision (CCTV) sets enabled with WIFI and Internet will be installed in strategic locations like entrance, parking, stores, hospital, and a few animal enclosures including off-display conservation breeding program and rescue & quarantine facility to monitor the visiting public and the activity of animals.

The Zoo shall develop a comprehensive information system for database management covering all aspects of the administration of the Zoo with a focus on online reporting and updating needs like reporting daily reports, inventory, diet, and media management etc.

The online system will be developed in such a way that it shall help in day-to-day zoo management, education, and awareness, sufficient problem-solving actions, RTI, PMFS, feedback, and other government schemes like grievances management etc.

An integrated tool should be developed for better data entry to make its database accessible to all personnel viz., animal keepers, biologists, veterinarians, curators, and senior management to aid in animal management, husbandry, treatment, and welfare of all captive animals housed in the Zoo.

Keeping in view of the advanced ideas and technology, the digitization of all the records, audio-visual aids, signages and virtual tours, online zoo ambassador program, etc. should be ensured through digital platforms.

## Chapter – 10

### 10.1 Miscellaneous

As mentioned earlier, conservation education is one of the major objectives of the establishment of the Sepahijala Zoological Park and Safari, all efforts shall be made that the Zoo follow the best practices available to impress upon the visitors to follow the suit. Rainwater harvesting, ground water recharge, solar lighting, use of LED lighting, use of e-vehicles, solid waste management of non-biodegradable waste by re-cycling, re-using and reducing (the use) and by composting of biodegradable waste shall be the mantra.

The Zoo shall adopt various energy and water saving measures besides measures to eliminate non-biodegradable materials like polythene and insecticides and instead compost and bio-pesticides shall be used.

### 10.2 Solar power

- All major buildings shall have solar panels fitted on these in order to provide power to the concerned buildings. This will reduce dependence on the city power supply and also reduce energy bills.
  - Veterinary hospital, Food store and animal night shelters shall have solar water heaters for providing hot water for cleaning purposes and for cooking of animal feed.
- III. Wherever necessary solar pumps shall be used for gardening and cleaning of the pavements.

### **10.3 Composting of bio-degradable waste**

All food waste, animal excreta and other vegetative material like cut grasses, fallen leaves, etc shall be collected and subjected to composting process. This compost shall be used for manuring the gardens plants, lawns and nurseries.

### **10.4 Bio-insecticides**

Bio-insecticides (instead of chemicals) shall be prepared out of the prescribed vegetative material and used against pests in the gardens.

### **10.5 Rainwater harvesting**

Water from roof tops and paved surfaces shall be collected and fed to the underground chambers for future use for different purposes. Excess water should be drained to substrate for recharge of ground water.

### **10.6 Recharging of ground water**

The Sepahijala Zoological Park and Safari shall work for recharging of ground water which will help improve ground water availability in the area. Services of experts in the field shall be used to channel water from roof tops of all major buildings for recharging of ground water.

### **10.7 Battery operated vehicles/vans and e-scooters**

For those who prefer not to walk, battery operated vehicles (BOVs) shall be used inside the Zoo. For routine movement of the veterinarians and other senior staff within the Zoo e-scooters shall be procured and allotted. For charging of battery charging points shall be provided at convenient locations in the Zoo.

### **10.8 Soil and moisture conservation measures along the *nalas***

There are some small seasonal water streams passing through the Zoological Park& Safari. These shall be trained to improve the moisture regime of the area by suitably located series of check dams

### **10.9 Energy saving lightings**

All the lighting in the Zoological Park shall be with LED bulbs to minimize use of energy.

### **10.10 Access to differently abled (Dibyangang) persons**

All facilities in the Zoological Park shall be accessible to differently abled persons. There shall be special toilets for them in each toilet complex. Ramps shall be provided in all over the visitors' areas to make the facilities negotiable for them.

## Chapter – 11

### 11.1 Management plan

The Master Plan of the Sepahijala Zoological Park and Safari for a period of next twenty years has been prepared based on the activities to be taken up as indicated in the Master Plan. A Management Plan listing out the activities to be taken up by the Park & Safari Management for implementing the Master Plan over five years indicating realistic costs of executing the identified activities and a bar chart giving temporal details of execution has been prepared and tabled in Chapter-12.

The developmental activities considered for five years are based on the ground requirements on priority. Environmental Enrichment Plan for proper furnishing of animal enclosures and Zoo Education Plan detailing conservation education and awareness activities to be undertaken in the Park & Safari shall also be prepared subsequently. The detail estimates and designs of the works considered in the Plan will be prepared year wise in the future. The expected expenses to be made and funding expected to be received from government and other funding agencies will also be provided in the future. This is a working document that will guide the managers of the Zoological Park & Safari in focused development and facilitate budgeting during the Plan period.

## Chapter – 12

### **12.1 Budget Analysis**

The budget has been prepared by taking into consideration of Tripura PWD Schedule of Rates 2023 and market rates. The budget is envisaged for 5 years for construction and development, as well as, for maintenance and operation which will be reviewed from time to time.

#### **12.1.1 Construction & Development**

Abstract of the expected cost (Preliminary Estimate – separate document) for construction and development has been prepared and is as given in table below. Work shall actually commence from the year 2024-25 and should complete by 2028-29.

A total budget of Rs 255.75 crores has been proposed for the construction and development of the Sepahijala Zoological Park and Safari.

## Abstract of the Cost (Construction & Development)


PRELIMINARY ESTIMATE				
REDEVELOPMENT OF SEPAHIJAL ZOOLOGICAL PARK AND SAFARI (TRIPURA)				
ABSTRACT OF COST				
SR.N	DESCRIPTION OF ITEM		AMOUNT	REMAR
1a	Building work & Misc. work	Rs	2450125941	Ref. Annexure-
1b	Extra Work & Richer Specification works	R	2496176	Ref. Annexure-
<b>Total</b>				<b>Rs.</b>
2	Restoring & Enriching the Area to be Developed 30 Ha @ Rs. 1,	R	300000	
3	Rehabilitation of Vegetation.	R	500000	
	<b>Total</b>	R	<b>2483087710</b>	'A'
	<b>Add 3% Contingencies on 'A'</b>	R	<b>7449263</b>	
<b>TOTAL COST OF PROJECT Rs. 2557580341.00</b>				


## PRELIMINARY ESTIMATE - BUILDINGWORK &amp; MISC.WORKS

SR. NO.	DESCRIPTION	AREA	UNIT	ACTUAL ESTIMATE RATES	AMOUNT	REMARKS	
				RATEPERSQM			
A	<b>LOADBEARINGCONSTRUCTIO</b>						
A1	<b>Floorheight3.35Mtr.</b>						
	<b>SingleStorey</b>						
1	Hospital(Existingmodified)	404.	Sqm	12426.50	Rs.	5031221.00	50%RatesasVe t.Hospital
2	CommissarySectionBuilding	254.	Sqm	24853.00	Rs.	6329050.00	ForRateR efDOMTkt Counter&P ublicToilet
3	AnimalSectionBuilding	117.	Sqm	24853.00	Rs.	2924569.00	
4	MaintenanceSection	387.	Sqm	24853.00	Rs.	9640021.00	
5	SanitaryandGardenSectionsBui	182.	Sqm	24853.00	Rs.	4524009.00	
6	Admin. Building	368.	Sqm	24853.00	Rs.	9165314.00	
7	TicketCounter&PublicToilets	826.	Sqm	24853.00	Rs.	20537586.00	
8	InterpretationCentre	976.	Sqm	24853.00	Rs.	24279910.00	
	ExtraCostforSeating	208.	Seats	6000.00	Rs.	1248000.00	
	StageCost12+15/2x8=108Sqm	108.	Sqm	3500.00	Rs.	378000.00	
9	Reptilehouse(50%)	1645. 51	Sqm	23116.00	Rs.	38037521.00	Ref.DOM Re
	ExtraHt	1645.	Sqm	421.00	Rs.	692758	CPW
10	Aquariumhouse	3400.	Sqm	46232.00	Rs.	157188800.	
b	GlassAquariumenclosers	222.	Sqm	7840.00		1740480	
11	NocturnalHouse	1645.	Sqm	46232.00	Rs.	76075218	
	ExtraHt	822.	Sqm	421.00	Rs.	346379	
12	Residences						
a	Type V(3units)	578.	Sqm	24853.00	Rs.	14371247	RefDOMAd
b	Type VI(3 units)	768.	Sqm	24853.00	Rs.	19087104	
13	FoodCourt/SouvenirShop (2 (35mx25m)+(28mX22m)+(9mx	1572.	Sqm	24853.00	Rs.	39068916	
	<b>ENCLOSURES</b>						
14	<b>AnimalHouses</b>						
a	Mammals(Ref.AnimalHouseAr						
	<b>MODIFIEDENCLOSERSAREA</b>						
1/E14	Tiger( <i>Pantheratigris</i> )	118.99	Sqm	74043.00	Rs.	8810377.00	
2/E15	Asiaticlion( <i>Pantheraleopersica</i> )	119.99	Sqm	74043.00	Rs.	8884420.00	
4/E17	Cloudedleopard( <i>Neofelisnebul</i>	103.54	Sqm	74043.00	Rs.	7666412.00	
5/E18	Leopardcat( <i>Prionailurusbengal</i>	61.78	Sqm	74043.00	Rs.	4574377.00	

6/E19	Asiaticgoldenecat( <i>Catopumate</i> )	61.78	Sqm	74043.00	Rs.	4574377.00	
7/E20	Marbledcat( <i>Pardofelismarmor</i> )	61.78	Sqm	74043.00	Rs.	4574377.00	
8/E21	Junglecat( <i>Felischaus</i> )	61.78	Sqm	74043.00	Rs.	4574377.00	
9/E22	Fishingcat( <i>Prionailurusviverrin</i> )	61.78	Sqm	74043.00	Rs.	4574377.00	
20/E49	Eurasianotter( <i>Lutralutra</i> )	55.70	Sqm	74043.00	Rs.	4124195.00	
21/E33	HimalayanblackBear( <i>Ursusthib</i> )	103.54	Sqm	74043.00	Rs.	7666412.00	
22/E34	MalayanSunBearHelarctosmal	103.54	Sqm	74043.00	Rs.	7666412.00	
23/E35	Hoolockgibbon( <i>Hoolockhooloc</i> )	103.54	Sqm	53893.25	Rs.	5580107.00	25%Pli
24/E42	Rhesusmonkey( <i>Macacamulatt</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
25/E44	Assamesemonkey( <i>Macacaassa</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
26/E39	Pig-	66.89	Sqm	53893.25	Rs.	3604919.00	
27/E41	Stump-	66.89	Sqm	53893.25	Rs.	3604919.00	
28/E40	Spectacledlangur( <i>Trachypithec</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
29/E36	Cappedlangur( <i>Trachypithecusp</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
30/E37	Greylangur( <i>Presbytisentellus</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
31/E38	Gee'sgoldenlangur( <i>Trachypith</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
32/E43	HamadryasBaboon( <i>Papiohama</i> )	66.89	Sqm	53893.25	Rs.	3604919.00	
34/E13	Indianrhino( <i>Rhinocerosunicorn</i> )	82.50	Sqm	168450.00	Rs.	13897125.00	AvgPA
	<b>DEMOLISH&amp;NEWENCLOSURES</b>						
3/E16	Commonleopard( <i>Pantherapar</i> )	103.54	Sqm	148086.00	Rs.	15332824.00	(ForPlinthAre
15/E23	Binturong( <i>Arctictisbinturong</i> )	59.27	Sqm	141689.00	Rs.	8397907.00	
16/E24	LargeIndiancivet( <i>Viverrazibeth</i> )	59.27	Sqm	141689.00	Rs.	8397907.00	
17/E25	SmallIndiancivet( <i>Viverriculaind</i> )	59.27	Sqm	141689.00	Rs.	8397907.00	
18/E26	Maskedpalmcivet( <i>Pagumalarv</i> )	59.27	Sqm	141689.00	Rs.	8397907.00	
19/E27	Asianpalmcivet( <i>Paradoxurushe</i> )						
35/E12	Hippopotamus( <i>Hippopotamus amphibious</i> )	153.46	Sqm	168450.00	Rs.	25850337.00	AvgPAR (Estimate)
*	DemolishingExsistingEnclosure	671.88	Sqm	2000.00	Rs.	1343760.00	
	<b>NEWENCLOSURES</b>						
10/E28	Wolf( <i>Carnislupus</i> )	87.08	Sqm	141689.00	Rs.	12338278.00	
11/E29	Wilddog( <i>Cuonalpinus</i> )	87.08	Sqm	141689.00	Rs.	12338278.00	
12/E30	Strippedhyena( <i>Hyenahyena</i> )	87.08	Sqm	141689.00	Rs.	12338278.00	
13/E31	Jackal( <i>Canisaureus</i> )	59.27	Sqm	141689.00	Rs.	8397907.00	
14/E32	Bengalfox( <i>Vulpesbengalensis</i> )	118.53	Sqm	141689.00	Rs.	16794397.00	
36/E11	Gaur( <i>Bosgaurus</i> )	82.50	Sqm	141689.00	Rs.	11689343.00	
37/E6	Sambar( <i>Rusaunicolor</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
38/E5	Sangai( <i>Rucervuselddii</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
39/E9	Chital( <i>Axisaxis</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
40/E1	Barkingdeer( <i>Montiecusmutjak</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
41/E2	Hogdeer( <i>Axisporcinus</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
42/E7	Nilgai( <i>Boselaphustragocamelu</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
43/E3	Redserow( <i>Capricornisrubidus</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
44/E4	Redgoral( <i>Naemorhedusbaileyi</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	

45/E10	Blackbuck( <i>Antilope cervicapra</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
48/E8	Indian wild boar( <i>Sus scrofa</i> )	82.50	Sqm	116064.00	Rs.	9575280.00	
b	<b>BIRDS</b>						
	<b>MODIFIED ENCLOSURE AREA</b>						
101/E50	Ostrich( <i>Struthio camelus</i> )	91.93		73479.00	Rs.	6754924.00	50%PAR
102/E51	Emu( <i>Dromiceus novaehollandi</i> )	91.93		73479.00	Rs.	6754924.00	50%PAR
	<b>DEMOLISH &amp; NEW ENCLOSURES</b>						
51/E52-56	Grey peacock pheasant( <i>Polyplect</i> )						
52/E52-56	Hume's pheasant( <i>Syrnaticus</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
53/E52-56	Blyth's pheasant( <i>Tragopan blythi</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
54/E52-56	Temminck's pheasant( <i>Tragopan</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
55/E57	Indian peafowl ( <i>Pavo cristatus</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
56/E52-56	Red jungle fowl ( <i>Gallus gallus</i> )						
57/E52-56	Kalij pheasant ( <i>Lophura</i> )						
58/E52-56	Golden pheasant						
59/E52-56	Silver pheasant ( <i>Lophura</i> )						
60/E52-56	Reeves pheasant ( <i>Syrnaticus</i> )						
61/E52-56	Lady Amherst's pheasant						
62/E52-56	Black francolin ( <i>Francolinus</i> )						
63/E52-56	Common quail ( <i>Coturnix</i> )	107.10	Sqm	146958.00	Rs.	15739202.00	
*	Demolishing Existing Enclosure	196.35	Sqm	2000.00	Rs.	392700.00	
	<b>NEW ENCLOSURES</b>						
64/E58-60	Great pied hornbill( <i>Buceros bico</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
65/E58-60	Oriental pied hornbill( <i>Anthraco</i> )						
66/E58-60	Rufous-	17.85	Sqm	146958.00	Rs.	2623200.00	
67/E58-60	Wreathed hornbill( <i>Rhyticeros</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
68/E58-60	Rhinoceros hornbill( <i>Buceros rhin</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
69/E72-78	Griffon vulture( <i>Gyps himalayensis</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
70/E72-78		17.85	Sqm	146958.00	Rs.	2623200.00	
71/E72-78	Indian white rumped vulture						
72/E72-78	Indian long billed vulture ( <i>Gyps</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
73/E72-78	Crested serpent eagle	17.85	Sqm	146958.00	Rs.	2623200.00	
76/E72-78	Brahminy kite ( <i>Haliastur indus</i> )	17.85	Sqm	146958.00	Rs.	2623200.00	
77/E70-71	Greater adjutant stork						
78/E70-71	Lesser adjutant stork						
79/E70-72	Asian openbill stork						
80/E70-72	Painted stork ( <i>Mycteria</i> )						
81/E70-73	Great white pelican ( <i>Pelecanus</i> )						
82/E70-73	Grey pelican ( <i>Pelecanus</i> )						
83/E70-74	Indian pond heron ( <i>Ardeola</i> )						
84/E70-74	Indian cormorant						
85/E70-75	Great white egret ( <i>Ardea alba</i> )	355.54	Sqm	146958.00	Rs.	52249447.00	1x6
86/E70-75	White winged wood duck						

87/E70-75	Green imperial pigeon (Ducula						
88/E70-75	Yellow-footed green pigeon						
89/E70-75	Rose-ringed parakeet						
90/E70-75	Red breasted parakeet						
91/E70-75	Blossom headed parakeet						
92/E70-75	Alexandrine parakeet	355.54	Sqm	146958.00	Rs.	52249447.00	1x6
93/E63-69	Cockatiel ( <i>Nymphicua</i>						
94/E63-69	Rosy-faced lovebird ( <i>Agapornis</i>						
95/E63-69	Blue and gold macaw ( <i>Ara</i>						
96/E63-69	Red and green macaw ( <i>Ara</i>						
97/E63-69	Scarlet macaw ( <i>Ara macao</i> )						
98/E63-69	Hyacinth macaw						
99/E63-69	Lesser sulphur-crested						
100/E63-69	GreyParrot( <i>Psittacuserithacus</i> )	104.10	Sqm	146958.00	Rs.	15298328.00	1x6
15/E48	CrocodileEnclosure	95.26	Sqm	148086.00	Rs.	14106672.00	
16	OffDisplayEnclosures						
a	SpottedDeer(2nos)-82.50Sqm	165.00	Sqm	116064.00	Rs.	19150560.00	
b	CloudedLeopard(2Nos)-120.99	241.98	Sqm	37021.50	Rs.	8958463.00	
c	PigTailedMonkey(2Nos)-66.89	133.78	Sqm	53893.25	Rs.	7209839.00	
d	Spectacledlangur(2Nos)-66.89	133.78	Sqm	53893.25	Rs.	7209839.00	
e	Binturong(2Nos)-59.27Sqm	118.54	Sqm	35422.25	Rs.	4198954.00	
17	Rescue&RehabilitationCenter(T						Av. PAR/1480
18	QuarantineCenter(TotalArea32	200.00	Sqm	168450.00	Rs.	33690000.00	
19	Extracostformaking						
20	SafariEnclosures(4Nos)						RedDON-
	4x82.50Sqm=330						
<b>A1</b>	<b>Total</b>					<b>Rs.1462500816.00</b>	
<b>A2</b>	<b>Floorheight2.90Mtr.</b>						
	<b>SingleStorey</b>						
21	GuardRoom-2no						PAR-
<b>A3</b>	<b>Sheds</b>						
22	ShelterinparingAreafordrivers	50.00	Sqm	12005.50	Rs.	600275.00	50%ofSrNo17
23	PrefabricatedBusshelter6mx2	12.00	Sqm	8500.00	Rs.	102000.00	MR
							
24	Shelters/Gazebos-5	100.00	Sqm	12005.50	Rs.	1200550.00	50%ofSrNo17 Rate

<b>A4</b>	<b>Misc.Buildings/Locations</b>						
25a	Incineratorbldg	625.00	Sqm	24853.00	Rs.	15533125.00	
25b	IncineratorMachineCost	1.00	No.	18000000.00	Rs.	18000000.00	
26	GraveYard(100mx63m)	6300.00	Sqm	320.00	Rs.	2016000.00	
27	SolidWasteManagement	500.00	Sqm	12005.50	Rs.	6002750.00	
28	MainGate						
a	Entry&ExitGate(14MtrHt.) 23mx15m=345Sqm- (withGFRwork)	345.00	Sqm	32000.00	Rs.	11040000.00	MR
							
b	SafariMainGate	250.00	Sqm	32000.00	Rs.	8000000.00	

29	ELECTRICALWORK						
a	ElectricSubStation- 7.5mx20m(Assumed)	150.00	Sqm	24011.00	Rs.	3601650.00	
b	FireFighting(A1fromSr.No1to17)						
	WithSprinklerSystem	114758.58	Sqm	890.00	Rs.	102135136.00	1.5.2/PAR-2023CPWD
c	FireAlarmSystem						
	AutomaticFireAlarmSystem	114758.58	Sqm	600.00	Rs.	68855148.00	1.6.2/PAR-2023CPWD
	<b>TOTAL</b>				Rs.	<b>1700187725.00</b>	A1-A4
<b>E</b>	<b>Servicers</b>						
1	InternalWater supplyinstallationfromSr.No 1to25	10.00	%	17001877 25.00	Rs.	170018773.00	
2	ExternalServicesConnection1to25	3.75	%	17001877 25.00	Rs.	63757040.00	
3	InternalElectricinstallation						

4	ExtraFor:						
a	PowerWiring&Plugs-1to17	4.00		% 14625008 16.00	Rs.	58500033.00	
b	CentralCallBellSystem-1to17	1.00		%14625008 16.00	Rs.	14625008.00	
c	TelephoneConduits-1to17	0.25		% 14625008 16.00	Rs.	3656252.00	
d	CentralizedintercomSystem-1to17	1.00		% 14625008 16.00	Rs.	14625008.00	
e	ComputerConduiting-1to17	0.25		% 14625008 16.00	Rs.	3656252.00	
5	QualityAssurance-1to17	1.00		% 17001877 25.00	Rs.	17001877.00	
6a	OverheadtankwithoutindependentStaging	50000.00	Litre	23.00	Rs.	1150000.00	RefPAR2023/4.1
6b	UnderGroundTank	500000.00	Litre	23.00	Rs.	11500000.00	RefPAR2023/4.5
7	Developmentofsite						
a	InternalRoads&PathswithWMM&Bituminoustop(Visitors)	20124.00	Sqm	2100.00	Rs.	42260400.00	RefPAR2023/5.2. 2

	1x3354x6.00=20124Sqm						
b(i)	InternalRoads&PathswithWMM&Bituminoustop(Service)	19461.00	Sqm	2100.00	Rs.	40868100.00	RefPAR2023/5.2.2
	1x5189.60x3.75=19461Sqm						
b(ii)	InternalRoads&PathswithWMM&Bituminoustop(Service)	8141.00	Sqm	2100.00	Rs.	17096100.00	RefPAR2023/5.2.2
	1x2171x3.75=8141.25Sqm						
c	cementconcretepavementwithvacuumdewateredconcrete						
	CarParking(98)	2785.00	Sqm				
	TwoWheeler(140)	1068.00	Sqm				
	Bus(9)	952.00	Sqm				
		4805.00	Sqm	2320.00		11147600.00	RefPAR2023/5.2.3

d	footpathwithpccbase60mmthickpave rblockandkerbstoneedging						
	CarParking(98)-2.00mwide	864.00	Sqm				
	TwoWheeler(140)-2.00mwide	288.00	Sqm				
	Bus(9)-4.00mwide	564.00	Sqm				
		1716.00	Sqm	2960.00		5079360.00	RefPAR2023/5.2. 4
e	Sewerage	5633.36	Mtr	3810.00	Rs.	21463102.00	RefPAR2023/5.3
f	FilterWaterSupply- PeripheralGrid150mmto300mmdiapi pe	5389.36	Mtr	4100.00	Rs.	22096376.00	RefPAR2023/5.4. 2
g	Distributionlinesupto100mmdia	2500.00	Mtr	1930.00		4825000.00	RefPAR2023/5.4. 1
h	Unfilteredwatersupplydistributionline s	6000.00	Mtr	1510.00	Rs.	9060000.00	5.4.1/Rs.1510/M tr
8	Stormwaterdrain-10%Areai.eof93Ha	6078.78	Mtr	10150.00	Rs.	61699617.00	RefPAR2023/5.5


9a	Providing&FixingG.lchainlinkfabricfencingofrequiredwidthinmeshsize50x50mmincludingstrengtheningwith2mmdia wireornutsandboltsandwasherasrequiredcompleteasperdirectionofEngineer-in-charge-MadeofG.iwireofdia	13672.94	Sqm	1017.80	Rs.	13916318.00	DSR-2023/CPWD/ITEM NO16.70.1
	BoundaryZoo-1x3112.70x2.40=8404.29						
	BoundarySafari-1x2195.27x2.40=5268.65						
9	Supplying,installation,testingandcommissioningofLEDstreet/compound/highmast/pathway/landscapelightingfor theentirezoo/safari	300000.00	Sqm	160.00	Rs.	48000000.00	RefPAR2023/6.19.1
10	Horticultureoperationincluding300mearthfilling,grassing,treeplantations/shrubsandpottedplantsetc.	20000.00	Sqm	312.00	Rs.	6240000.00	RefPAR2023/5.9.1
11	SoakPit-4nos-3.6mx3.6mx3.00m	4.00	Nos	8500.00	Rs.	34000.00	
12	ElectricSubstationwith						

a	Supplying, installation, testing and commissioning of 33 kv substation comprising 33kv HT panel, transformers 33kv/11kv, 11kv HT panel, interconnections, 11kv underground cabling to the distribution substation on ring main system, substation earthing, substation safety equipment	1000.00	KVA	3800.00	Rs.	3800000.00	RefPAR2023/6.1.1
b	Supplying, installation, testing and commissioning of 33kv/0.433kv or 11kv/0.433kv substation equipment comprising HT panel, transformers, HT cable, bus trucking from transformer to LT panel, LT panels, automatic power factor correction panel, active harmonic filters, TVSS (transient panel, earthing, required interconnections, substation safety equipment including LT cabling from substation to the buildings fed by the	1000.00	KVA	9000.00	Rs.	9000000.00	
c	Supplying, installation, testing and commissioning of silent type DG sets, AMF panel, bus ducting/cables from DG set to essential panel, synchronizing panel where required, DG set enclosure rooms sound insulation/ventilation/smoke exhaust as	1000.00	KVA	11560.00	Rs.	11560000.00	RefPAR2023/6.3.1

13	CCTVSystem- installationofIPSbasedCCTVsystemfor buildingSecuritycomprisingofPTZ,fixe dcamera,cabling,recording,displaysys temandhardwareandsoftwaresupport. AdminArea,ResidentialArea, TicketingArea ,SreviceRoadBusShelters&Enclouser Gates	300000.00	Sqm	210.00	Rs.	63000000.00	RefPAR2023/6.1 0.1
14	EvChargingstationtwoDCgunschargea tthesametimerinturn Capacity:150KW						
	Size:900*525*2000(W*D*H)mm(two guns)	2.00	Nos	90000.00		180000.00	OilLubeSystemsP rivateLimited
	Size: 1000*525*2000(W*D*H)m (threeguns)	1.00	No	122000.0 0		122000.00	
						Rs. 2450125941. 00	X
<b>TOTTOTAL- ANNEXURE-A (BUILDING WORK &amp; MISC. WORKS)</b>							

## PRELIMINARY ESTIMATE - EXTRA WORKS

SR. NO.	DESCRIPTION	AREA	UNIT	HOSPITAL/NO N- RESIDEN TIAL	RESIDENTIAL	AMOUNT	
						RATE	PERSQ M
1	Window A/C-2T-10 Nos including installation	10.00	Nos	60000.00		Rs	600000.00
2	Providing Telescopic Automatic Telescopic Bollards at Main Gate & Safari Gate (Set of 4)	2.00	Nos	175000.00		Rs	350000.00
3	Electromechanical Boom Barriers with all accessories up to 6-meter length Main Gate	2.00	Nos	125000.00		Rs	250000.00
4	Under Vehicle Scanner System (UVSS) of high resolution with scanning up to a speed of 30Km/Hr.	1.00	Nos	550000.00		Rs	550000.00
5	Hand Held Metal Detector	3.00	Nos	3200.00		Rs	9600.00
6	Under Vehicle Mirror Scanner with arm length 90cm, Mirror Dia 30cm & Wt. 2Kg (Approx.)	3.00	Nos	4000.00		Rs	12000.00
7	SIT & C of Sewer Treatment Plant of 180 KL / Day capacity, all complete as per direction of Engineer-in Charge	180.00	per KL	50000.00		Rs	9000000.00
8	Tube Well - Boring & installation - 2 Nos	2.00	Nos.	350000.00		Rs.	700000.00
9	SIT & C of RO Plant	1.00	Nos	3000000.00		Rs.	3000000.00
10	Purchase of 4 Nos Electric Bus (15 Seater) Speed: 25km/ Hr.	4.00	Nos	1150000.00		Rs.	4600000.00

	 Speedways Electric-SEB-14						
11	illuminatedsignages(ontotalplint harea)	114758.58	Sqm	22.00		Rs .	2524688.76
12	SteetFurniture						
a	SSBench	50.00	Nos	12000.00		Rs .	600000.00
b	SSLitterBin	50.00	Nos	8000.00		Rs .	400000.00
c	SSDrinkingWaterFountains	5.00	Nos	65000.00		Rs .	325000.00
d	Bollards-SS&Stone	200.00	Nos	1500.00		Rs .	300000.00

13	GlassAquarium	222.00	Sqm	7840.00		Rs	1740480.00
<b>TOTAL-ANNEXURE-B</b>		<b>Rs: 24961768.76</b>					

Further details including detailed architectural, engineering and technical drawings and detailed estimate etc. considering Tripura PWD schedule of rates shall be prepared subsequently depending upon progress of work as per requirement.

A bar chart has been prepared for temporal distribution of works within 5 years and also placed below.

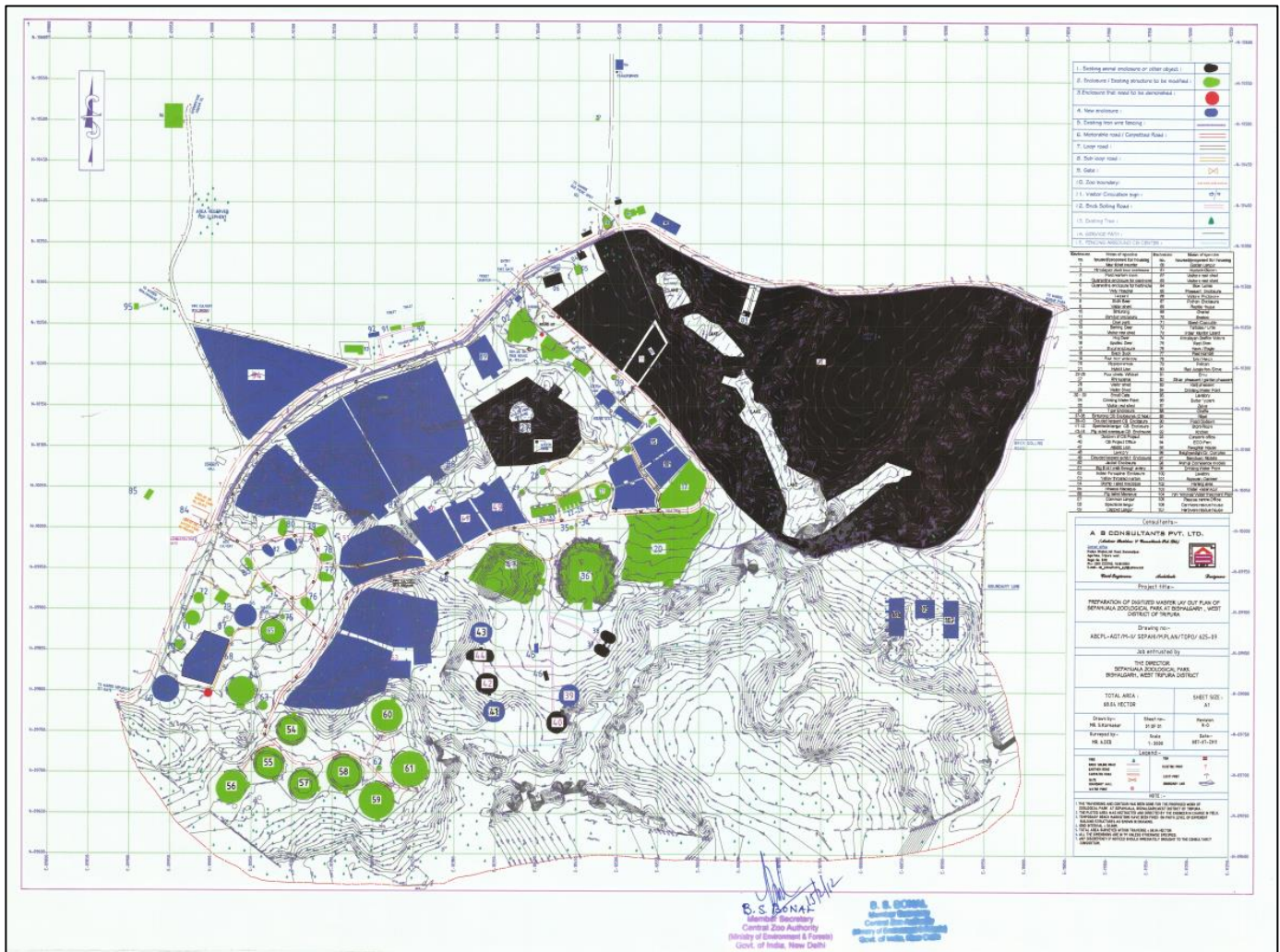


### 12.1.2 Day to Day Maintenance

S. No.	Description	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
<b>A</b>	<b>Expenditure</b>						
1.	Salaries	316.0	350.0	400.00	450.0	500.0	600.0
2.	Contract manpower	00.0	20.0	25.0	30.0	40.0	50.0
3.	Outsourced payments	15.0	20.0	50.0	100.0	110.0	120.0
4.	Animal Feed	250.0	300.0	350.0	400.0	450.0	500.0
5.	Medicines/Supplements	50.0	55.0	60.0	70.0	75.0	80.0
6.	Office Expenditure	40.0	45.0	50.0	60.0	70.0	75.0
7.	Consumables	44.0	50.0	55.0	60.0	65.0	70.0
8.	Maintenance	300.0	330.0	370.0	400.0	450.0	500.0
9.	Other Expenditure	60.0	65.0	75.0	85.0	95.0	100.0
10.	Miscell.	50.0	55.0	60.0	65.0	70.0	80.0
	<b>Total (A)</b>	1125.0	1290.0	1495.0	1720.0	1925.0	2175.0
<b>B</b>	<b>Revenue Collection</b>						
	Gate Collection	30.0	40.0	100.0	200.0	400.0	600.0
	Other Collections	5.0	10.0	30.0	50.0	100.0	200.0
	<b>TOTAL: (B)</b>	35.0	50.0	130.0	250.0.0	500.0	800.0.0

# Annexures

## Annexure – 1: Approved (by CZA in 2012) First Master (layout) Plan Sepahijala Zoological Park



## Annexure-2: List of Flora of Sepahijala Wildlife Sanctuary

Trees, shrubs, climbers, herbs, grasses, aquatic plants, epiphytes and non-flowering plants with reference to status

SI No.	Local name	Botanical named	Family
1.		Spilenthus ochmella	
2.		Lycopodium ceronuoum	
3.	Kalakoitcha		
4.	Bandhania		
5.		Cassia tura	
6.		Sidago tinosa	
7.	Bhite	Clerodendron viscosum	Verbenaceae
8.	Lajjabati	Mimosa pudica	Mimosaceae
9.		Lantena camera	Verbenaceae
10.	Thatch	Imperata cylindrical	Gramineae
11.		Elias guinensis	
12.	Pathar kuchi	Bryophyllum pinnatum	
13.	Kaski	Cushea toona	Meliaceae
14.	Maricha	Eupatorium audoratum	Compositeae
15.	Kalameg	Endograpis peniculata	Gramineae
16.	Tukma	Haptis suavaolens	Labiaceae

17.		<i>Lygodium flexiosum</i>	Sahizeaceae
18.	Bantulshi	<i>Ocimum bacilicum</i>	Labietae
19.		<i>Scoperia dulchis</i>	Scrophurاليةae
20.		<i>Elephanto pascabar</i>	Compositeae
21.		<i>Ludwigica perviflora</i>	Onagraceae
22.		<i>Achyranthus aspara</i>	Amaranthaceae
23.		<i>Anisomales atodes</i>	
24.	Sial Mutri	<i>Vernonia cynoniara</i>	Compositeae
25.	Teur grass	<i>Cyperus sp.</i>	
26.	Bandheki	<i>Blacknam orientalis</i>	Blaknaceae
27.		<i>Angiopteris evikta</i>	Myrtaceae
28.	Termoli	<i>Carculigo orchioides</i>	Zingeraceae
29.	Ghagra	<i>Trienpheta romboidia</i>	Tiliaceae
30.	Akkan	<i>Calotropis procera</i>	
31.	Kachu	<i>Alocashia sp</i>	
32.	Kata kachu	<i>Lassie heterophylla</i>	
33.	Thankuni	<i>Centela assiatica</i>	
34.	Main chus	<i>Scirpus flavus</i>	
35.		<i>Eriocaulon sp.</i>	Gramineae
36.		<i>Spilenthus ochmela</i>	Compositeae

37.	Amrul	<i>Oxalis corniculata</i>	
38.		<i>Sensiviera roxburghii</i>	
39.		<i>Crotolaria palida</i>	Papilionaceae
40.		<i>Blumea</i> sp.	
41.	Janguni	<i>Cassia accidentalis</i>	Caesalpaniaceae
42.	Kakral	<i>Momordica cochinchinensis</i>	Cucurbitaceae
43.		<i>Justicia gendarinica</i>	Acanthaceae
44.	Bhutta	<i>Zeamays</i> sp.	Gramineaceae
45.		<i>Dactyloctenium aegyptium</i>	Gramineae
46.		<i>Oldenlandia corymbosa</i>	Rubiceae
47.	Dolan	<i>Leucas sphaerocarpa</i>	Labiatae
48.	Karabi	<i>Thersia peruviana</i>	Apocynaceae
49.		<i>Lantana camara</i>	Verbenaceae
50.	Langra	<i>Cirsium aciculatum</i>	Gramineae
51.	Dahaduma	<i>Typhonium trilobatum</i>	Amaraceae
52.		<i>Floscopa scandens</i>	Commelinaceae
53.		<i>Drosera burmanica</i>	
54.	Silver oak	<i>Gravellia robusta</i>	Proteaceae
55.	Chari awal	<i>Sterospermum personatum</i>	Sterculiaceae

56.	Jagya dumur	<i>Ficus glumerata</i>	Moraceae
57.	Kadam	<i>Anthocephalus trinansis</i>	Rubiaceae
58.	Hargaza	<i>Dillenia pentagyna</i>	Delianaceae
59.	Tetul	<i>Tamarindus indica</i>	Leguminosae
60.	Amra	<i>Spondius mengifera</i>	Anacardiceae
61.		<i>Cassia siamea</i>	Caesalpinaceae
62.	Semul	<i>Bombax ceiba</i>	Bombaceae
63.	Ghora neem	<i>Melia azadirach</i>	Meliaceae
64.	Jarul	<i>Lagerstromea flosregine</i>	Lythraceae
65.	Kanchan	<i>Bauhunia sp</i>	Caesalpinaceae
66.	Band gandhari	<i>Dardenia latifolia</i>	Rubiaceae
67.	Neem	<i>Azadiracta indica</i>	Meliaceae
68.	Sal	<i>Shorea robusta</i>	Dipterocarpaceae
69.	Bahera	<i>Terminalia belerica</i>	Combretaceae
70.	Amlaki	<i>Emblica officinalis</i>	Euphorbiaceae
71.	Menda	<i>Litsea gratinosa</i>	Lauraceae
72.	Kakra	<i>Aporusa roxburghii</i>	Euphorbiaceae
73.	Kao	<i>Gercinia kaud</i>	Ebnaceae
74.	Kumira	<i>Careya arborea</i>	Lacythidaceae
75.	Jira bat	<i>Ficus romphai</i>	Moraceae

76.	Neur	Bursera serrata	Burseraceae
77.	Chamal	Artocarpus chaplasi	Moraceae
78.	Sidha Jarul	Lagerstromed Paryiflora	Lythraceae
79.	Kali Awal	Vitex Pendancularis	Verbenaceae
80.	Bel	Aegle marmelox	Rutaceae
81.	Mango	Mangifera indica	Anacardiaceae
82.	Darchini	Cinamomum jelanicum	Lauraceae
83.	Nageshar	Mesua ferrea	Guttiferae
84.	Debdaru	Polyalthia longifolia	Anonaceae
85.	Kanchan	Bauhinia verigata	Caesalpinaceae
86.	Chatiwan	Alstonia scholaris	Apocynaceae
87.	Jalpai	Elaeocarpus pruvifolia	Elacocarpaceae
88.	Sonal	Cassia fistula	Caesalpinaceae
89.	Bajna	Zanthoxylum bodrunga	
90.	Bankadam	Myragyna perviflora	
91.		Anesomeles ovata	Labiatae
92.	Peltaform	Peltaforum inermea	Caesalpineae
93.	Raktanchan	Adenantha pavonia	Leguminoseae
94.	Andaman pedok	Pterocarpus dalberjoides	Leguminoseae
95.	Rakta bura	Macaranga peltata	Euphorbiaceae

96.	Kamini	<i>Murraya peniculata</i>	Rutaceae
97.	Kanak	<i>Schima wallichii</i>	Lythraceae
98.	Acacia	<i>Acacia auricoliformis</i>	Mimosaceae
99.	Mandar	<i>Erythrina indica</i>	Papilionaceae
100.	Rahena	<i>Afanomaxis Polistacaya</i>	Meliaceae
101.	Jam	<i>Syzygium cumini</i>	Myrtaceae
102.	Bat	<i>Ficus henzamina</i>	Moraceae
103.	Bakul	<i>Mimosop elangi</i>	Sapotaceae
104.	Agar	<i>Aquilaria malacansis</i>	Aquilariaceae
105.	Bottle brush	<i>Calystomon viminalis</i>	Myrtaceae
106.	Chalmugra	<i>Taraktogenas kurzii</i>	Flacourtiaceae
107.	Khair	<i>Acacia catechu</i>	Mymosaeae
108.	Haritaki	<i>Terminalia chebula</i>	Combretaceae
109.	Pukia tetai	<i>Percia Javonica</i>	Mymosaceae
110.	Titt Jam	<i>Eucania precox</i>	Myrtaceae
111.	Macher kanta / Jalpoma	<i>Engelhardtia spikata</i>	Juglandecae
112.	Menda awal	<i>Litsea utinosa</i>	Lauraceae
113.	Jagya Dumur	<i>Ficus hispida</i>	Moraceae
114.	Ban mala	<i>Callicarpa</i>	Verbenaceae

115.	Karai	Albezzia procera	Mimosaceae
116.	Huria	Litsea polyantha	Lauraceae
117.	Bat	Ficus reliogosa	Moraceae
118.	Bandar pislá	Slerispermus senisiotum	
119.	Kanchan	Bouhenia sp.	Caesalpinaceae
120.	Mahoa	Madhuka latifolia	Sapalaceae
121.	Loha tree	Xylia xylocarpa	Leguminoseae
122.	Pongamia	Pongamia pinnata	Leguminoseae
123.	Harish	Albezzia stipulata	Mimosaceae
124.	Medda Awal	Litsea sahifera	Lauraceae
125.		Nantolis assamica	Sapotaceae
126.	Bangandhari	Gardenia latifolia	Rebiaceae
127.	Karamcha	Carisa carandas	Apocynaceae
128.	Pichla	Grewia microcosm	Tiliaceae
129.	Kutki (Bhata)	Melastroma malabatricum	Melostomaceae
130.	Lotcon	Baccaurea sapida	
131.	Ban Barai	Zigiphus rogusa	Rhamnaceae
132.		Cassia tora	Caesalpinaceae
133.	Sarpa gandha	Rewvolfia sarpentina	Apocynaceae

134.	Asoka	<i>Saraca indica</i>	Caesalpinaceae
135.	Bogamedula	<i>Teprosia candida</i>	Papilionaceae
136.	Curry Patta	<i>Murraya koningi</i>	Rutaceae
137.	Karabi	<i>Thebytia pruviana</i>	Apocynaceae
138.	Batkari	<i>Sida equitd</i>	
139.	Kurcha	<i>Holarrhena antidysenterica</i>	Apocynaceae
140.	Ban jamir	<i>Glycosmith pentaphylla</i>	Rutaceae
141.	Ban barai	<i>Zygiophus enophylla</i>	Rhamnaceae
142.	Naichha (Ban)	<i>Trema orientalis</i>	Ulmaceae
143.	Keran	<i>Zetropha carcus</i>	Euphorbiaceae
144.	Bisjaran	<i>Justicia gandarosa</i>	Acanthaceae
145.	Man Kanta	<i>Vengoiaria spinosa</i>	Rubiaceae
146.	Kathali Champa	<i>Artabotrys audorotisima</i>	Anonaceae
147.	Sonkaich	<i>Abrus precatorious</i>	Papilionaceae
148.		<i>Hedyotis sp</i>	
149.	Bilogudi	<i>Sida sp.</i>	
150.		<i>Ladwigia parviflora</i>	

151.	Biskathali	Polygonum sp.	
152.	Biri pata	Diospyrus melanoxylum	Abenaceae
153.	Nayan tara	Vinca rosed	Apocynaceae
154.	Coffee	Coffea robusta	
155.	Punga Meti	Cassia sofera	Caesalpinaceae
156.	Bantagar	Tabernimontana coronaria	
157.	Ghanta	Alamanda cathertica	Apocynaceae
158.		Lagerstroemia indica	Lythraceae
159.	Refugi lata	Micania skands	
160.	Karai lata	Albizzia sp.	Mimosaceae
161.	Swarna lata	Cascuta refluxa	Convolvulaceae
162.	Kumira lat	Smilax zelanica	Smilaceae
163.	Mouchani lata	Stephania harnandifolia	Menispermiceae
164.	Dud lat	Melhothiria haterophyla	Cucurbitaceae
165.	Chummachi lata	Tinosperma cordifolia	Menispermiceae
166.	Refugi	Hediotis hispida	Rubiaceae
167.	Makhal	Passiflora foitida	Passi
168.		Piper longum	
169.		Desmodium sp.	Paplionaceae

170.		Nilsonia sp.	Acanthaceae
171.	Hicha	Alteruanthera sessilas	
172.		Hydrolia sp.	
173.	Golmarich	Piper nigram	Piperaceae
174.	Dukundulan	Michania chordate	
175.	Bandar hoola	Muena prurita	
176.	Barak bamboo	Bamboosa balcoa	Gramineae
177.	Paura bamboo	Bamboosa teres	Gramineae
178.	Mritinga bamboo	Bamboosa tulda	Gramineae
179.	Orchid	Venda roxburghii	Orchidaceae
180.		Peperomia pelucida	Piperaceae
181.	Danta kalas	Leucus aspara	Labiatae
182.	Dalak takhi	Amaranthus viridis	
183.	Shamlaicuk	Gnephalum leutoalbum	Compositae
184.	Dukmasak	Butenaria pilosa	
185.	Rilir	Sapindus mukrasi	

### Annexure-3: Faunal diversity of Sepahijala Wildlife Sanctuary

- **Mammals:**

Sl.No.	Mammals	Scientific name
1	slow loris	<i>Nycticebus coucang</i>
2	capped langur	<i>Trachypithecus pileatus</i>
3	Phayre's langur	<i>Trachypithecus phayrei</i>
4	pig-tailed macaque	<i>Macaca nemestrina</i>
5	Binturong,	<i>Arctictis Binturong</i>
6	clouded leopard	<i>Neofelis nebulosa</i>
7	leopard cat	<i>Prionailurus bengalensis</i>
8	Chinese pangolin	<i>Manis pentadactyla</i>
9	Common Palm Civet	<u><i>Paradoxurus hermaphroditus</i></u>
10	Rhesus macaque	<i>Macaca mulatta</i>
11	Jungle cat	<i>Felis chaus</i>
12	large Indian civet	<i>Viverra zibetha</i>
13	Small Indian civet	<i>Viverricula indica</i>
14	Small Indian mangoes	<i>Herpestes javanicus</i>
15	Common mongoose	<i>Herpestes edwardsi</i>

16	Common otter	<i>Lutra lutra</i>
17	Barking deer	<i>Muntiacus muntjak</i>
18	Indian wild boar	<i>Sus Scrofa Cristatus</i>
19	Fishing cat	<i>Prionailurus viverrinus</i>
20	Indian porcupine	<i>Hystrix indicus</i>
21	House rat	<i>Rattus rattus</i>
22	Three striped squirrels	<i>Funambulus palmarum</i>
23	Flying squirrel	<i>Pteromyini or Petauristini</i>
24.	Orange bellied Himalaya squirrel	<i>Dremomys lokriah</i>
25	Horybellied Himalayan squirrel	<i>Collosciurus Pygerythrus</i>
26	Beared sheathtailed bat	<i>Tophozous melanopogon</i>
27.	Indian flying fox	<i>Pteropus giganteus</i>
28.	Fulvous fruit fox	<i>Roudettus lescheneuiti</i>
29.	Shortnosed fruit bat	<i>Cynopterus sphinx</i>

- **BIRDS:**

Sl. No.	English Name	Scientific name
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1	Black Drongo Or King Crow	<i>Dicrurus adsimilis</i>
2	Bronze Drongo	<i>Dicrurus aeneus</i>
3	Greater Racket-Tailed Drongo	<i>Dicrurus paradiseus</i>
4	Lesser Racket-Tailed Drongo	<i>Dicrurus remifer</i>
5	Whitebellied Drongo	<i>Dicrurus caerulescens</i>
6	Small Yellownaped Wookpecker	<i>Picus chlorolophus</i>
7	Rufous Woodpecker	<i>Micropternus brachyurus</i>
8	Lesser Goldenbacked Woodpecker	<i>Dinopium benghalense</i>
9	Indian Goldenbacked Threetoed Woodpecker	<i>Dinopium javanense</i>
10	Pigmy Woodpecker	<i>Picoides nanus</i>
11	Little Scalybellied Green Wookpecker	<i>Picus myrmecophoneus</i>
12	Pond Heron	<i>Ardeola grayii</i>
13	Night Heron	<i>Nycticorax nycticorax</i>
14	Bittern	<i>Botaurus stellaris</i>
15	Purple Heron	<i>Ardea purpurea</i>
16	Grey Heron	<i>Ardea cinerea</i>

17	Cattile Egret	<i>Bubulcus ibis</i>
18	Little Egret	<i>Egretta garzetta</i>
19	Smaller Egret	<i>Egretta intermedia</i>
20	Large Egret	<i>Ardea alba</i>
21	Lesser Whistling Teal	<i>Dendrocygna javanica</i>
22	Large Whistling Teal	<i>Dendrocygna bicolor</i>
23	Little Cormorant	<i>Phalacrocorax niger</i>
24	Indian Shag	<i>Phalacrocorax fuscicollis</i>
25	Darter Or Snake Bird	<i>Anhinga rufa</i>
26	Coot	<i>Fulica atra</i>
27	White Breasted Water Hen	<i>Amaurornis Phoenicurus</i>
28	Kora Or Water Cook	<i>Gallicerex cinerea</i>
29	Indian Myna	<i>Acridotheres tristis</i>
30	Jungle Myna	<i>Acridotheres fuscus</i>
31	Pied Myna	<i>Sturus contra</i>
32	Hill Myna	<i>Gracula religiosa</i>
33	Bank Myna	<i>Acridotheres ginginaianus</i>
34	Indian Robin	<i>Saxicoloides fulicata</i>
35	Tailor Bird	<i>Orithotomus sutorius</i>
36	Shama	<i>Copsychus malabaricus</i>

37	Franklin's Wren-Warbler	<i>Prinia hodgsonii</i>
38	Rufousbellied Babbler	<i>Dumetia hyperythra</i>
39	Jungle Babbler	<i>Turdoides striatus</i>
40	Blue Rock Thrush	<i>Monticola solitaries</i>
41	Magpie-Robin	<i>Copsychus saularis</i>
42	Jungle – Crow	<i>Corvus macrohynchos</i>
43	House Crow	<i>Acridotheres splendens</i>
44	Tree Pie	<i>Dendrocitta vagabunda</i>
45	Green Magpie	<i>Cissa chinensis</i>
46	Roller Or Blue Jay	<i>Coracias benghalensis</i>
47	Indian Pied Hornbill	<i>Anthracoceros malabaricus</i>
48	Spotted Dove	<i>Streptopelia chinensis</i>
49	Little Brown Dove	<i>Streptopelia senegalensis</i>
50	Blue Rock Pigeon	<i>Columba livia</i>
51	Green Imperial Pigeon	<i>DUCULA AENEA</i>
52	Common Green Pigeon	<i>Preron phoenicoptera</i>
53	Emeraild Dove	<i>Chalcophaps indica</i>
54	Blackheaded Oriole	<i>Oriolus xanthornus</i>
55	Purple Sunbird	<i>Nectarinia asiatica</i>
56	Blackheaded Yellow	<i>Pycnonotus melanicterus</i>

	Bulbul	
57	Redvented Bulbul	<i>Pycnonotus cafer</i>
58	Redwhiskered Bulbul	<i>Pycnonotus jocosus</i>
59	Large Green Barbet	<i>Megalaima zeylanica</i>
60	Lineated Barbet	<i>Megalaima lineate</i>
61	Crimsonthroated Barbet	<i>Megalaima rubricapilla</i>
62	White Wagtail	<i>Motacilla alba</i>
63	Forest Wagtail	<i>Motacilla Indica</i>
64	Yellow Wagtail	<i>Motacilla flava</i>
65	Indian Tree Pipit	<i>Anthus hodgsoni</i>
66	Whitebreasted Kingfisher	<i>Halcyon smyrnensis</i>
67	Brownheaded Stork- Bulled Kingsisher	<i>Pelargopsis capensis</i>
68	Small Blue Kingfisher	<i>Alcedo atthis</i>
69	Blue-Eared Kingfisher	<i>Alcedo meninting</i>
70	Barred Jungle Owlet	<i>Glaucidium radiatum</i>
71	Spotted Owlet	<i>Athene brama</i>
72	Browm Wood Owl	<i>Strix leptogrammica</i>
73	Brown Fish Owl	<i>Bubo zeylonensis</i>
74	Barn Or Screech Owl	<i>Tyto alba</i>
75	Indian Greathorned Owl	<i>Bubo-bubo</i>

76	Small Green Bee-Eater	<i>Merops orientalis</i>
77	<i>Bluebeaded Bee-Eater</i>	<i>Nyctyornis athertoni</i>
78	White Ibis	<i>Threskiornis aethiopica</i>
79	Common Pariah Kite	<i>Milvus migrans</i>
80	Greyheaded Fishing Eagle	<i>Ichthyophaga ichthyaetus</i>
81	Indian Longbilled Vulture	<i>Gyps indicus</i>
82	Common Or Grey Quail	<i>Coturnix coturnix</i>
83	Indian Redbreasted Parakeet	<i>Psittacula alexandri</i>
84	Roseringed Parakeet	<i>Psittacula krameri</i>
85	Openbill Stork	<i>Anastomus Oscitans</i>
86	Grey Shrike	<i>Lanius excubitor</i>
87	Large Cuckoo-Shrike	<i>Coracina novaehollandiae</i>
88	Indian Cuckoo	<i>Cuculus micropterus</i>
89	Koel	<i>Eudynamis scolopacea</i>
90	Indian Drongocuckoo	<i>Surniculus liugubris</i>
91	Commonhawk-Cuckoo	<i>Cuculus varius</i>
92	Lessercoucal	<i>Centropus toulou</i>
93	Largegreenbilled Malkoha	<i>Rhopodytes trisis</i>
94	Small Greenbilled Malkoha	<i>Rhopodytes viridirostris</i>

95	Crow-Pheasant Or Coucal	<i>Centropus sinensis</i>
96	Redwattled Lapwing	<i>Vanellus indicus</i>
97	Yellow-Wattfield Lapwing	<i>Venellus malabaricus</i>
98	Greenshank	<i>Tringa nebularia</i>
99	Grwypartridge	<i>Francolinus pondicerianus</i>
100	Red Jungle Fowl	<i>Gallus gallus</i>
101	Hoopoe	<i>Upupa epops</i>
102	Junglenight Jar	<i>Caprimulgus indicus</i>
103	Common Indian Night Jar	<i>Caprimulgus asiaticus</i>
104	Blackbreasted Weaver Bird	<i>Polceus benghalnsis</i>
105	Baya Weaver Bird	<i>Polceus philippinus</i>
106	Redmunia	<i>Estrilda amandava</i>
107	Housesparrow	<i>Passer domesticus</i>
108	Indian Pitta	<i>Pitta brachyuran</i>
109	Bluenapedpitta	<i>Pitta nipalensis</i>
110	Palmswift	<i>Cypsiurus parvus</i>
111	House Swift	<i>Appus affinis</i>
112	Goldmantled Chloropsis	<i>Chloropsis cochinchinensis jerdoni</i>
113	Iora	<i>Aegithina tiphia</i>

114	Grey Tit	<i>Parus major</i>
115	Whitee-Eye	<i>Zosterops palpebrosa</i>
116	Commonsnipe	<i>Gallinago gallinago</i>
117	Kalij Pheasant	<i>Lophura leucomelana</i>
118	White Winged Balck Tit	<i>Parus muchalis</i>
119	Crested Serpent Eagle	<i>Spilornis cheela</i>
120	Brahmini Kite	<i>Haliastur Indus</i>
121	Smew	<i>Mergus albellus</i>
122	White Stork	<i>Ciconia ciconia</i>
123	White Backed Indian Vulture	<i>Gyps bengalensis</i>
124	Greater Yellow Napped Wook Packer	<i>Picus flavinucha</i>
125	Black Drongo Or King Crow	<i>Dicrurus adsimills</i>
126	Bronze Drongo	<i>Dicrurus aeneus</i>
127	Greater Racket-Tailed Drongo	<i>Dicrurus paradiseus</i>
128	Lesser Racket-Tailed Drongo	<i>Dicrurus remifer</i>
129	Whitebellied Drongo	<i>Dicrurus caerulescens</i>
130	Small Yellownaped Wookpecker	<i>Picus chlorolophus</i>

- REPTILES:

SL.NO.	Species	Scientific Name
1.	Banded kraite (Sonkoni)	<i>Bungarus fasciatus</i> (Schneider)
2.	Rat snake (Daraise),	<i>Ptyas mucosus</i> (Linn.)
3.	Green whip snake (Laoduki)	<i>Ahaetulla nasuta</i> (Lacepede)
4.	(Jinglapura)	
5.	King Cobra (Fanak).	<i>Ophiophagus Hannah</i> (Cantor)
6.	(Monosa)	
7.	Reticulate cobra	
8.	Monocellate cobra	<i>Naja kaouthia</i>
9.	Water snake	<i>Anhydrys anhydrys</i> (Schneider)
10.	Monitor lizard	<i>Varanus bengalensis</i>
11.	House Lizard	<i>Hemidactylus frenatus</i>
12.	Tortoise	<i>Geochelone elegans</i> (Schoepff.)
13.	Turtles	<i>Melanochelys trijuga</i> (Schweigger)
14.	Black Cobra	<i>Naja oxiana</i>
15.	Indian cobra	<i>Naja naja</i> (Linn.)
16.	Golden tree of flying	<i>Chrysopelea ornate</i> (Show)

	snake	
17.	Common wolf snake	<i>Lycodon aulicus (Linnaeus)</i>
18.	Buffstripe keelback	<i>Amphiesma stolata (Linn.)</i>
19.	Checkered keelback	<i>Xenochrophis piscator (Schneider)</i>
20.	Common rat snake	<i>Ptyas mucosus (Linn.)</i>
21.	Maitya saap	
22.	Common worm blind snake	<i>Ramphotyphlops braminus (Daudin)</i>
23.	Reticulated python	<i>Python reticulates (Schneider)</i>
24.	Indian chameleon	<i>Chamaeleon zeylanicus Laurenti</i>
25.	Common Indian monitor	<i>Varanus bengalensis (Schneider)</i>
26.	Common skink	<i>Oligosoma nigriplantare</i>
27.	Tucktoo	<i>Gekko gekko (Linn)</i>

- **AMPHIBIANS:**

SL.NO.	Species	Scientific Name
1.	Skipping frog	
2.	Paddyfield frog	
3.	Indian bull frog	<i>Rana tigerina Daudin</i>
4.	Tree frog	<i>Polypedates Maculatus (Gray)</i>

5.	Ornate microhyllid frog	
6.	Common Indian toad	Bufo melanostictus Schneider

- **FISH:**

SINo	Scientific Name	family
1	<i>Catla catla</i>	cyprinidae
2	<i>Labeo rohita</i>	cyprinidae
3	<i>L. calbasu</i>	cyprinidae
4	<i>L. gonius</i>	cyprinidae
5	<i>L. bata</i>	cyprinidae
6	<i>L. dero</i>	cyprinidae
7	<i>Cirrhinus mrigala</i>	cyprinidae
8	<i>C. reba</i>	cyprinidae
9	<i>Tor tor</i>	cyprinidae
10	<i>Punitius sarana</i>	cyprinidae
11	<i>P. sophore</i>	cyprinidae
12	<i>P. ticto</i>	cyprinidae
13	<i>P. chola</i>	cyprinidae
14	<i>Amblypharyngodon mola</i>	cyprinidae
15	<i>Esomus danricus</i>	cyprinidae
16	<i>Osteobrama cotio</i>	cyprinidae

17	<i>Oxyguster bacaila</i>	cyprinidae
18	<i>Danio devario</i>	cyprinidae
	<i>Noemacheilus aurius</i>	cobitidae
20	Ranimacch/Betrangi	cobitidae
21	<i>Chaca chaca</i>	chacidae
22	<i>Clarius batrachus</i>	clanidae
23	<i>Heteroneustes fossilis</i>	saccobranchidae
24	<i>Wallago auttu</i>	siluridae
25	<i>Ompak pabda</i>	siluridae
26	<i>Aorichthys seenghala</i>	bagridae
27	<i>Mystus aor</i>	bagridae
28	<i>M. gulio</i>	bagridae
29	<i>Mystus tengra</i>	bagridae
30	<i>M. vittatus</i>	bagridae
31	<i>Rita rita</i>	bagridae
32	<i>Aorichthys seenghala</i>	bagridae
33	<i>Mystus aor</i>	bagridae
34	<i>M. gulio</i>	bagridae
35	<i>Bagarius bagarius</i>	sisoridae
36	<i>Pangasius pangasius</i>	pangasiidae

37	<i>Eutropiichthys vaccha</i>	schibeidae
38	<i>Clupisoma gaura</i>	schibeidae
39	<i>Silonia silonia</i>	sibuidae
40	<i>Chanda nama</i>	centropomidae
41	<i>C. ranga</i>	centropomidae
42	<i>C. baculis</i>	centropomidae
43	<i>Nandus nandus</i>	nanolidae
44	<i>Badis badis</i>	nanolidae
45	<i>Anabas testudineus</i>	anabantidae
46	<i>Colisa lalio</i>	anabantidae
47	<i>C. chuna</i>	anabantidae
48	<i>C. fasciatus</i>	anabantidae
49	<i>Glossogobius guiris</i>	gobidae
50	<i>Gudusia chapra</i>	chupeidae
51	<i>Notopterus notopterus</i>	notopteridae
52	<i>N. chitala</i>	notopteridae
53	<i>Channa gachua</i>	channidae
54	<i>C. panctatus</i>	channidae
55	<i>C. striatius</i>	channidae
56	<i>C. marulius</i>	channidae

57	<i>Channa gachua</i>	channidae
58	<i>Xenentodon cancila</i>	belonidae
59	<i>Mastacembelus armatus</i> - Bhaim	mastacembelidae
60	<i>M. pancalus</i> - Chikra Bhaim	mastacembelidae
61	<i>Macragnathus aculeatus</i>	mastacembelidae
62	<i>Tetrason cutcutia</i>	tetraodontidae
63	<i>Amphipnous cuchia</i>	amphipnoidae
64	<i>Alpocheilus panchax</i>	amphipnoidae
65	<i>A. melastigma</i>	amphipnoidae

- **IMPORTANT INVERTEBRATES:**

SL.No.	Common name	Scientific nam
1.	Brown plant hopper	Nilaparvata lagans
2.	Rice bug	Leptacorisa acute
3.	Sarghum shoot bug	Peregrine's media
4.	Wheat aphid	Macrosiphum miscanthi
5.	Mustard aphid	Lipaphie erysimi
6.	Painted bug	Bagrada hilans
7.	Cotton leafhopper	Amrasca biguttula
8.	Cotton white fly	Bemisia tabaci

9.	Cotton aphid	Aphid gossipy
10.	Red cotton bug	Dysdercus koenigii
11.	Pyrilla	Pyrilla perpusilla
12.	Sugarcari black bug	Cavelericy excavatus
13.	Sugarcari white fly	Alevralabus baradensis
14.	Sugarcore mealy bug	Saccharicocqua facchari
15.	Brinjal laec wing bug	Urerticy sentig
16.	Citrus psylla	Diapharina citri
17.	Citrus meals bug	Pseudococcus filamentous
18.	Citrus white fly	Dialevrodes citri
19.	Mango hopper	Amritodus Atkinson
20.	Mango Mealy bug	Drosicha mangiferae
21.	Litchi bug	Chrysocoris stalii
22.	Green leaf hoppers	Nephotettix nigropictus
23.	Ground nut achid	Aphis cracirora
24.	Rose aphid	Macrosiphum resaeiformis
25.	Arecanut mired bug	Carvalhoia arecae
26.	Coconut scale	Aspidiotus destructor
27.	Coffee gren bug	Coccus viridig
28.	Tea mosquito bug	Helopettig theivara

29.	Cotton white fly	Bemisia tabaci
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**Annexure – 4: Inventory of animals (as on 31st March 2023)  
Sepahijala Zoological Park**



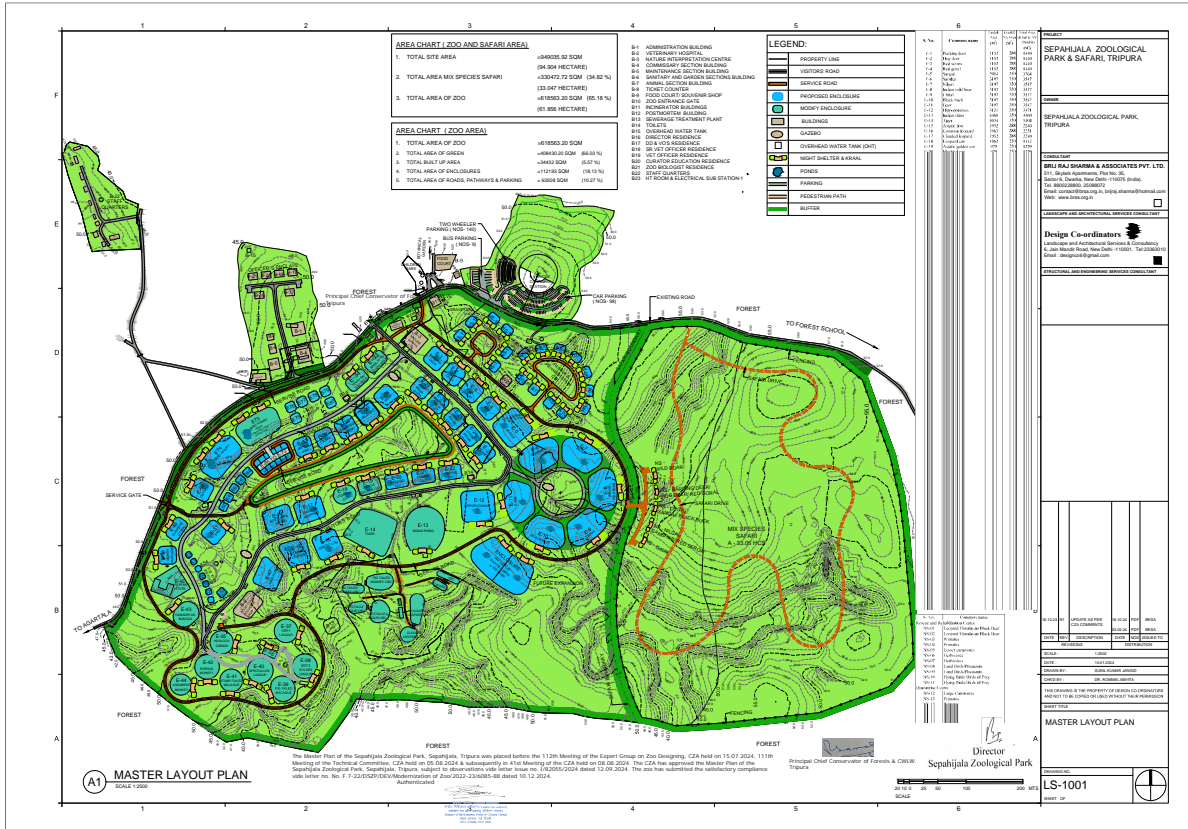
Annual Inventory report of Schedule III & IV animals of Sepahijala Zoological Park for the F.Y 2022-23																										
SN	Animal's Name	Scientific Name	Opening Stock as on 01/04/2022				Birth				Acquisition				Disposal				Death				Closing Stock as on 31/03/2023			
			M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
1	<b>BIRDS</b>																									
	Total Birds		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>MAMMALS</b>																									
2	Rhesus Macaque	<i>Macaca mulatta</i>	3	3	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Mammals		3	3	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>REPTILES</b>																									
3	Total of Reptiles		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total of Animals		3	3	4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<p>Curator Sepahijala Zoological Park Sepahijala Tripura</p> <p>Asistant Director, ARDD Sepahijala Zoological Park Sepahijala Tripura</p> <p>Director Sepahijala Zoological Park Sepahijala Tripura</p>																										

Annual Inventory report of Exotic Animals of Sepahijala Zoological Park for the F.Y 2022-23																										
SN	Animal's Name	Scientific Name	Opening Stock as on 01/04/2022				Birth				Acquisition				Disposal				Death				Closing Stock as on 31/03/2023			
			M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
1	Hippopotamus	<i>Hippopotamus amphibius</i>	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Mammals		1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Birds</b>																									
2	Emu	<i>Dromaius novaehollandiae</i>	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Birds		1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>REPTILES</b>																									
3	Red Eared Turtle	<i>Trachemys scripta elegans</i>	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total of Reptiles		0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Animals		2	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<p>Curator Sepahijala Zoological Park Sepahijala Tripura</p> <p>Asistant Director, ARDD Sepahijala Zoological Park Sepahijala Tripura</p> <p>Director Sepahijala Zoological Park Sepahijala Tripura</p>																										

## Annexure – 5: Contour Survey Map of the Site Sepahijala Zoological Park and Safari



# Annexure – 6: Master (layout) Plan Sepahijala Zoological park and Safari



## Annexure – 7: Notification of Health Advisory Committee Sepahijala Zoological park and Safari

GOVERNMENT OF TRIPURA  
ANIMAL RESOURCES DEVELOPMENT DEPARTMENT  
P. N. COMPLEX, AGARTALA.

NO.F.1-2/ARDD/GEN/2012/1327-29

Dated, Agartala, the 2<sup>nd</sup> <sup>MOY</sup> April 2018

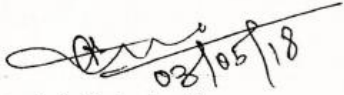
### MEMO

Sir,

A health advisory committee of Sepahijala Zoological park has been re-constituted with the following panel of experts for offering health care advice to Sepahijala Zoological authority.

1. HOD, Teaching Veterinary Clinical Complex.
2. HOD, Surgery.
3. HOD, Medicine.
4. HOD, Animal Reproduction and Gynecology.
5. HOD, Animal Nutrition.
6. HOD, Pathology.

This has approval of the Government vide U.O.NO.134/Secy/ARDD Dated 24.04.2018.

  
( Dr. Asit Chakrabarti)

Director

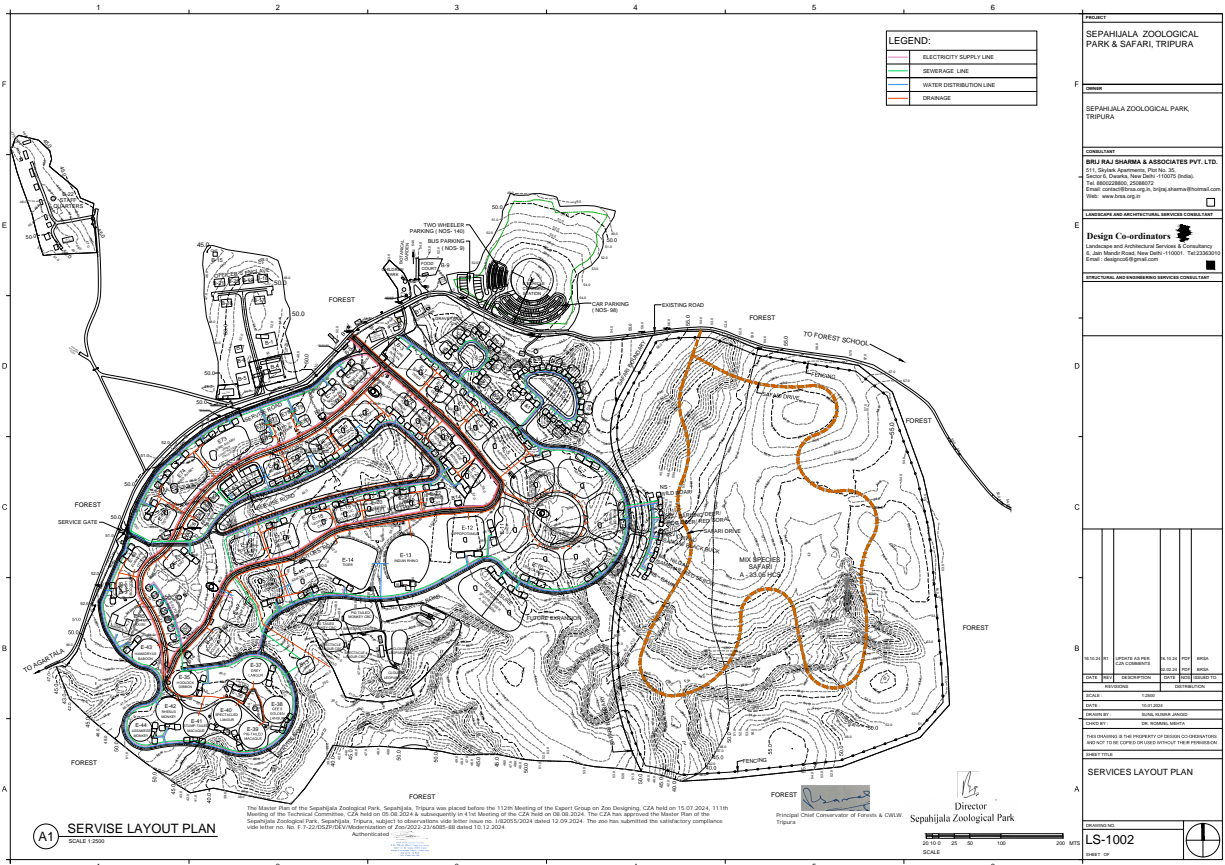
Animal Resources Development Dept.  
Govt. of Tripura.

Copy to:-

1. The Principal C.V. Sc. & A.H. K.K. Nagar for kind information.
2. The District Forest Officer, Sepahijala District for information.
3. The Director, Zoological Park, Sepahijala for information.

# Annexure – 8: Proposed site plans: Water Supply, Electricity Distribution, Sewerage disposal and Storm Water Drainage Networks

## Sepahijala Zoological park and Safari



## **Annexure – 9: Tripura State Zoo Authority (TSZA)**

### **Memorandum of Association (MoU)**

1. Name:

The name of the association shall be "Tripura State Zoo Authority".

2. Registered Office:

The registered office of the association shall be situated at the Department of Forests, Government of Tripura, Agartala (Tripura).

3. Objectives:

The objects of the association shall be

- (a) to take over the management of the Government controlled zoological parks/gardens, deer parks, breeding centres, rescue centres, safari parks and other similar establishments/organisations in the state of Tripura as may be specifically ordered from time to time by the Government of Tripura,
- (b) to co-ordinate the animal collection and exchange programmes and to procure such animals as may be required for the enrichment of the zoos/parks/gardens by purchase or exchange from other states in India or from abroad,
- (c) to function as the apex technical advisory body for the zoological parks/gardens, deer parks, breeding centres, rescue centres, safari parks and other similar establishments/organisations in the state of Tripura,
- (d) to promote zoo activities in the state of Tripura,
- (e) to undertake collection, preservation etc. of endangered species of animals.
- (f) to undertake programmes for restocking and reintroduction of captive bred animals,
- (g) to undertake research on habits and breeding of animals and birds in their natural habitat as well as in captivity,

- (h) to create awareness about the rich faunal diversity by organising programmes, exhibitions, seminars, etc. and publishing journals, bulletins, etc.,
- (i) to undertake dissemination of zoo education, and
- (j) to carry on non-profit seeking business as buyers or sellers of or dealers in living and dead fauna of all kinds of skins, horns and other animals' products.

4. Governing Body:

The membership of the said society shall consist of -

- (a) the Chief Secretary to the Government of Tripura
  - (b) the Secretary to the Government of Tripura, Department of Forests
  - (c) the Secretary to the Government of Tripura, Finance Department
  - (d) the Secretary to the Government of Tripura, Tourism Department
  - (e) the Principal Chief Conservator of Forests and Head of Forest Force, Tripura
  - (f) the Chief Wildlife Warden, Tripura
  - (g) the Member-Secretary, Central Zoo Authority, New Delhi or his/her representative
  - (h) Vice Chancellor, Tripura University or his/her representative
  - (i) the Director of Animal Health&Veterinary Services, AnimalResourcesDevelopment Department, Governmentof Tripura
  - (j) the Member Secretary, Tripura State Zoo Authority, not below the rank of Conservator of Forests
  - (k) the Director, Sepahijala Zoological Park and Safari
  - (l) a representative of an animal welfare/wildlife conservation related NGO from the state of Tripura nominated, by notification, as member by the Government of Tripura.
5. The Governing Body of the said Society shall comprise of all the members thereof. The member mentioned in clause (a) of paragraph 4 of this notification shall hold the office of Chairman of the said Society and the member mentioned in clause (b) of paragraph 4 of this notification shall hold the office of Vice Chairman of the said Society. The officer nominated as a member under clause (j) of paragraph 4 of this notification shall hold the office of

Member Secretary of the said Society. But, until the officer is so nominated, the member mentioned in clause (k) of paragraph 4 of this notification shall hold the office of Member Secretary of the said Society.

**Constitution and terms of reference of Technical Committee, Tripura State Zoo authority**

1	CWLW, WB	Chairman
2	Director, Animal Husbandry & Veterinary Services, Tripura	Member
3	Zoo Expert (to be nominated by the Chairman, TC, TSZA)	Member
4	Director, SZP&S	Member
5	Sr Veterinary Officer, SZP&S	Member
6	Member Secretary, TSZA	Convener

**Terms of Reference:**

1. To provide technical assistance to zoos under control of TSZA for their proper and scientific development/management.
2. To make recommendation to the Governing Body, TSZA regarding annual plan of operation and other developmental activities in various zoos and other organizations.
3. To approve the exchange of animals between zoos under control of TSZA and with other zoos which are not part of Schedule I of the Wildlife (Protection) Act, 1972.
4. To make recommendations to the Central Zoo Authority regarding exchange of animals between zoos under TSZA and with other zoos which are part of Schedule I of the Wildlife (Protection) Act, 1972.
5. To approve proposals for arranging training programmes, workshops, and meetings in zoos under TSZA on various aspects of zoo management.

6. To approve research proposals on issues related with conservation/zoos for funding from the TSZA and/or other agencies/organizations.
7. Any other functions that may be assigned by the Tripura State Zoo Authority.