BIOLOGICAL PARK, CHIDIYATAPU

South Andaman Island

MASTER PLAN (2017 – 2037)

Wildlife Wing

Department of Environment & Forests

Andaman & Nicobar Administration

BIOLOGICAL PARK, CHIDIYATAPU
MASTER PLAN (2017-2037)
with a provision for revision after ten years

(Submitted in year 2016-17)

A comprehensive plan for the development, improvement and upgradation of facilities and infrastructures of the Biological Park, Chidiyatapu, as a modern facility for *ex-situ* Biodiversity conservation, Education and Research

CERTIFICATE

Biological Park, Chidiyatapu

Master Plan (2017-2037)

Prepared by

(Shri Yesu Ratnam, IFS)
Deputy Director, Biological Park,
Chidiyatapu

Countersigned by

(Shri D.M. Shukla, IFS)
Principal Chief Conservator of Forests
&Chief Wildlife Warden,
Andaman & Nicobar Islands

Master Plan of Biological Park, Chidiyatapu is approved by the Technical Committee of the Central Zoo Authority in its 80th meeting held on 04.11.2016 vide agenda item No. 4, subject to condition that the responsibility of mobilizing financial resources for implementation of the Master Plan will be sole responsibility of the Forest Department, Administration of Andaman and Nicobar Islands.

CENTRAL ZOO AUTHORITY OF INDIA

Member Secretary
Central Zoo Authority

सदस्य सचिव/Member Secretary
केन्द्रीय चिड़ियाघर प्राधिकरण/Central Zoo Authority
पर्यावरण वन और जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest & Climate Change
भारत सरकार, नई दिल्ली
Govt. of India, New Delhi

INDEX

PREFACE

The Department of Environment and Forests had established a Mini Zoo at Haddo, Port Blair in 1967 in an area of about 4 Ha, where certain species of wild animals, mostly rescued ones, were exhibited to the general public, mostly for recreational purposes. However, with a paradigm shift in the understanding and realization of the *ex situ* conservation concept, the Biological Park at Chidiyatapu Reserved Forest area, covering an area of 40 Ha, was conceptualized in 1992. Being one of the important Biological hotspots of the world, the Chidiyatapu Biological Park (CTBP) was set to not just meet the existing need of housing the surplus animals of the Mini Zoo, but also to necessitate captive breeding of rare and endangered species of Andaman and Nicobar Islands, to strengthen nature education and interpretation, to create awareness towards wildlife conservation and promote scientific researches, alongwith creation of recreational facilities for general public, based on the guidelines of the Wildlife Institute of India, Dehradun.

The constructions of various enclosures were taken up in phased manner and the Park was opened for public visitation on 1st October, 2009.

The National Zoo Policy of 1998 mandates all Zoos in India to be managed in such a way so as to ensure development of a wholesome scientific temper towards conservation and management of wildlife through scientific and optimum realization in terms of the land, water, energy and finances. The strategic vision of the Central Zoo Authority states that for the Indian Zoos, "…will have healthy animals in eco-system based naturalistic exhibits, supportive to in situ conservation with competent and connective staff, good educational and interpretative facilities and the support of people and be self- sufficient". The National Zoo Policy aims at giving proper direction and thrust to the management of zoos by mustering co-operation and participation of all concerned stakeholders.

The present document, based strictly on the guidelines of the Management Plan as issued by the Central Zoo Authority, envisages catering to the dynamic needs of management of a Biological Park of National importance. It outlines the future development scopes in terms of the facilities that can be extended to the general public and the specialists alike, emphasizing on *ex situ* conservation of representative wild fauna and flora of the Andaman and Nicobar Islands.

The Master Plan delineates the duties of the Park Management Authority in managing the park activities in the best possible participative manner so as to fulfil the set objectives and attain the purported aim of conservation and protection through larger participation of the citizenry. It provides directions and guidelines along which the various components are to be developed over a period of time, giving due importance to the site-specific requirements. It aims towards providing a near-natural habitat for housing the endemic and representative flora and fauna of these Islands, with a profound importance to aesthetics. Further, species specific handling, rescue and rehabilitation plans too have been incorporated, including Disaster Management and Contingency Plans to mitigate vulnerability associated with the landscape. Tentative

Budgetary provisions throughout the management period, along with day-today management have been diligently worked out to assist the Park Manager to develop CTBP as has been conceptualised.

The Master Plan has taken the present form with the continuous help, support, guidance and untiring efforts of many a worthy expert and conservationists in right earnest.

Amongst the earlier contributors, the efforts taken by the Consultant, Shri Pushp Kumar, IFS (Retd.) to prepare detailed project report of the Biological Park, is placed on record.

Along the way, the timely guidance, insightful opinions and technical support rendered by Shri Ajai Saxena, IFS, the then APCCF (WL& Eco-tourism), Shri Alok Saxena, IFS (Retd.), the then PCCF (ANI), Shri M.S. Negi, IFS, the then PCCF (WL), Shri Tarun Coomar, IFS, PCCF (ANI) and Shri D.N. Singh, IFS (Retd.), the then Member Secretary, CZA is acknowledged.

The relentless efforts and contribution made by the staff and support team of CTBP, viz. S/Shri S.K. Thomas, S. Ganeshan, Thomas Varghese, A.K. Paul who held the charge of Deputy Director, BPCT, Shri Anil V. John, Smt. Monideepa Banerjee, Dr. Sam Varghese, Shri Shivendra, Shri Amarendra Kumar Singh, Range Forest Officers and Shri Binod Dung Dung, Forester; Shri S. Seema Chelam, Forester; Shri Gautam Adhikari, Forest Guard, Shri Sachin, Forest Guard and all others whose name could not be mentioned in developing the Master Plan is acknowledged and placed on record. The technical support of team of GIS Cell at Van Sadan in preparing various maps was critical in developing this Master Plan.

The generous financial assistance rendered by the Administration/CZA/ MoEF&CC towards preparation of the drafts and subsequent improvement is gratefully acknowledged.

Profound appreciation stand reserved for all the line Departments, including the Andaman & Nicobar Regional Centres of Botanical Survey of India and Zoological Survey of India, Port Blair for their technical inputs and support throughout the preparation of this Master Plan.

Most importantly, gratitude is reserved for the visitors and the public of Andaman & Nicobar Islands whose feedback helped in fine tuning of the recommendations in the Master Plan.

Yesu Ratnam, IFS
Deputy Director, CTBP

Foreword

Biological Diversity, the sum total of variety and variability among all life forms in the world is the very basis of existence for all life forms on this Earth. However, the growing population and aspirations of the human civilization is exerting an immense negative pressure on the biological resources that the nature in general harbours on both land and in water. Globally efforts are afoot to not just contain the extreme damages that have been metted out to the environment and the natural resources due to the insatiable human greed. Through established ex situ and in situ conservation approaches, scientific measures are being taken to reverse the damages already done, or atleast to contain it to the extent possible.

Traditionally zoos have been menageries or private collections of animals held onto and passed down through hierarchy, aimed mainly towards recreation. Over the years, the approach has had a paradigm shift and importance and emphasis has been laid on furtherance of understanding the value of such wild animals and developing an awareness of not just the animal but also the habitat in which it thrives. The Central Zoos Authority (CZA) through its guidelines outlines the requirement of eco-system based naturalistic exhibits supportive to in situ conservation and lays supreme emphasis on the educational and interpretative facilities through which to attract and motivate general public to conservation of wild flora and fauna, while involving various stakeholders at all vertical and horizontal levels.

This Master Plan speaks about the future development of the Chidiyatapu Biological Park, spread over an area of 40 Ha and outlines the measures to be taken to further the causes of biodiversity conservation, education and research. It lays emphasis on eco-tourism through participative management. Fully implemented, CTBP is set to become one of a prime *ex situ* conservation facility of this region specializing in conserving and breeding rare, endangered and endemic species of these Islands, insuring a population for the natural habitats here.

The Master Plan has been written by Shri Yesu Ratnam, IFS, the Deputy Director, Chidiyatapu, Biological Park an extremely dedicated and hardworking officer and without whose sincere efforts, this massive documentation was not practically feasible.

(D.M. Shukla IFS)
Principal Chief Conservator of Forests (WL)
and Chief Wildlife Warden
Andaman and Nicobar Islands

Part-I

1. Introduction.

2. Appraisal of the present situation and constraints.

Chapter - I

1. INTRODUCTION

1.1 Background

Andaman & Nicobar archipelago in the Bay of Bengal, consisting of over 500 oceanic islands, with an area of 8,249 Square Kilometres and a coast line of 1962 km, have a unique and much-varied floral and faunal composition. These islands are a hot spot of biodiversity with endemism occurring in varied ecosystems such as Tropical wet-evergreen forests, Tropical moist deciduous forests, Littoral forests and mangrove swamps, sea grass beds, coral reefs in the marine realm. More than 5100 species of animals including 58 species of mammals, 246 species of birds and 76 species of reptiles represent the faunal wealth of the islands. Endemism which is normally associated with island ecosystems is represented in all its manifestation in these islands as well. Overall 9% of the fauna is endemic which includes 40% of the reported bird species and sub species, 60% of the 58 mammal species and over 50% of the 68 reptiles and 20 amphibian species. The marine ecosystem is rich in coral reefs with more than 250 species of hard coral and over 1000 species of fishes. Major marine species includes many species of whales and dolphins, dugong, estuarine crocodile, four species of sea turtles, sea snakes and many species of sharks (Jayaraj & Andrews, 2005).

The flora of the area generally resembles to that of neighbouring South-East Asia. As per the available records, out of the 2400 species of vascular plants, about 300 taxa are reported to be endemic to these islands. The Angiosperm flora accounts for roughly more than 2000 taxa. Besides Angiosperms, the area is represented by quite a good number of species of Gymnosperms and Pteridophytes also. As many as 7 species of Gymnosperms and 120 species of Pteridophytes (Ellis, 1987) have been reported from these islands. Often referred as a paradise for botanists and nature lovers, these islands have become a hot spot for biodiversity research and tourism attracting over 1,00,000 tourists and many researchers who are interested in nature based tourism and island biodiversity.

In this background, the Biological Park at Chidiyatapu was conceived in early 1990's to be developed as a centre for biodiversity conservation, research and education for the Island, acting as an ex-situ conservation facility for the unique endemic species many of which are endangered due to their limited or restricted distribution and small populations.

1.2 History

Owing to its special geographical location in the Bay of Bengal, Andaman and Nicobar islands have been bestowed with a unique assemblage of flora and fauna, which resembles much with the natural elements of Indo-Chinese and Indo-Malayan region. The diverse habitats ranging from the luxuriant tropical rain forests, clear coastal waters to the open oceans, harbour a range of unique and

fascinating wildlife. To make aware the people of these islands of this unique biodiversity, a Mini Zoo was established at Port Blair during 1967 with the objective of exhibiting the faunal species of these Islands mainly for educational and recreational purpose. A captive breeding facility for Estuarine or Salt water Crocodile (*Crocodilus porosus*) was subsequently added in the Mini Zoo. But as per the guidelines defined subsequently by the Central Zoo Authority (CZA), Ministry of Environment and Forest, a zoo should aim to house and display wild animals with the objectives of creation of empathy for wild animals and to provide a near natural setting for the display of animals. Though attempts were made to bring some modifications in the Mini Zoo at Port Blair but it was unable to meet the above stated requirement of the modern Zoo due to space constraint and a disturbed city surrounding.

Considering the limitations, need was felt during the late eighties to establish a Biological Park on modern and scientific lines in a natural setting and sufficiently large area having pollution free environment. The Wildlife Advisory Board of the Union Territory recommended in 1989 for the creation of a new Biological Park. It was decided to develop a modern Biological Park at Chidiyatapu on the southern tip of South Andaman Island, 26 Km away from Port Blair. After carrying out detailed survey, a plan was prepared by DCF (Wildlife-1), Port Blair and the project proposal was submitted to the Central Zoo authority in 1992. The main criteria for selecting the area for new facility at Chidiyatapu were:

- Natural landscape and large spaces for enclosures and other facilities.
- Site well connected with Port Blair, having a good road link and transportation.
- Pollution free environment as it is surrounded by natural forests.
- Rare and endangered plant and animal species occurring naturally in the Biological Park area and in surrounding forests.
- Endangered Nicobar Megapode, Narcondam Hornbill and Nicobar Pigeon can be bred easily in naturally available littoral and tropical forests.
- The different conservatories proposed will help to conserve many endemic and endangered species of flora of the islands.
- Being adjacent to sheltered Macpherson Strait it will be possible to house and exhibit marine species like Dolphin, Dugong, Sea turtles, Estuarine crocodile in large enclosures, making the facility a truly unique for the country.

The Central Zoo Authority conveyed its approval for the proposal of shifting the Mini Zoo to Chidiyatapu in May 1993 vide letter F.No.19-98/92-CZA dated 03.05.1993 (Annexure-1, Page No. 98). The Ministry of Environment and Forests approved diversion of 40 Ha of forest land in Chidiyatapu for establishment of this Biological Park in May 1997 (Annexure- 2,). In the year 1998, the Department engaged Shri Pushpa Kumar as a consultant to prepare a detailed Plan and designs of enclosures for the proposed Biological Park. A revised layout plan (Part III Map 5**,**) with additional enclosures to showcase some mainland species introduced in these Islands along with local species was prepared.

The construction work of enclosures started in 1998. As per the Plan, five enclosures for animals like Spotted Deer, Hog Deer, Sambar deer, Barking deer, and Wild pig were constructed departmentally. Further construction of three enclosures to house Crocodiles, Water monitor lizard and Marine turtle was entrusted to Andaman Harbour Works; an organization under the Ministry of Shipping specialized in making structures in marine environment.

Subsequently based on the guidelines of the CZA and considering various factors, the Steering Committee decided not to bring any exotic species from mainland such as Sambar, Leopard and to display only local and endemic species along with some of the major introduced species. Due to the mega earthquake and resultant devastating tsunami of 26th December 2004, the boundary wall and the enclosures of the Reptile Section were damaged. Enclosures were reconstructed at the same site, but due to certain design fault in the marine turtle enclosure, it was decided to modify it to house the estuarine crocodiles. After the earthquake certain changes were also made in the Plan and the enclosure for Crab eating macaque and Orchidarium were shifted to a new site, as the earlier site was not found suitable.

Due to changes made in the enclosures, their location and the policy decision to not to show exotic species; the entire area was re-surveyed in 2008 and a Lay-out map on a 1:1000 scale with 2 meter contour interval was prepared (**Annexure, Map-3,**). All the existing enclosures, buildings and facilities were then mapped and integrated on this map in the GIS domain. Based on the fresh surveys and contour mapping and on the advice of the technical team of CZA which inspected the facilities at the Biological Park, Chidiyatapu in December 2008 and also as per the latest guidelines of the Central Zoo Authority, action was initiated to develop a revised Master (Layout) Plan of the Biological Park (Part III Map 6). In the meantime Biological Park was opened for public viewing on 1st October 2009 as most of the enclosures were completed.

The development of the Biological Park, Chidiyatapu can be categorised into four phases as indicated below:

S.No.	Phase	Time period
1	Phase – I	1992-2011
2	Phase – II	2011-2021
3	Phase – III	2021-2031
4	Phase – IV	2031-2037

This Master Plan is aimed to provide direction for development and maintenance of the Biological Park over the next 20 years i.e. 2017 to 2037 with a provision for midterm revision after ten years. The proposal is based on the topography of the site, water availability, vegetation, climate, visitors profile, conservation, education and research needs and convenience of management.

The draft Master Plan of the zoo was returned by the Central Zoo Authority with observations for modifications vide letter NO.19-38/92-CZA(331) (Vol-IV)(M)/2215 dated 21.02.2013.

1.3 Vision and Conservation Message of the Zoo:

The Andaman and Nicobar Islands being geographically isolated making itself a locality in high endemism of a unique biodiversity consisting of Tropical rain forests, rich marine life and large scale genetic resources. The Biological Park will be a place to study the animal behaviour and develop species specific conservation and management strategies. The park will develop techniques for conservation breeding of endemic species and maintain insurance population as an institution for species recovery of endemic species.

1.4 Mission

To encourage people to develop a caring attitude towards nature and all living beings; to serve as a dynamic breeding and nature conservation centre for endemic, rare and endangered faunal and floral species found in this archipelago and to offer public service through eco awareness, education and recreation to the visitors to achieve goals of nature conservation and wildlife as a whole.

1.5 Strategy:

The Biological Park, Chidiyatapu is coming up in a natural forest block consisting of many type of forests. It is known for the abundance of birds throughout the year and is often referred to as bird paradise. It is located outside the Municipal limits of Port Blair.. It is also connected by road to have easy access. The layout of the zoo is based on the evolution of life.

The enclosures provide most natural habitat of the species to be housed. The zoo will have the representatives of Andaman and Nicobar Islands mainly. The zoo will be a Centre for maintaining insurance population through conservation breeding of the endemic species of these Islands and help in sustaining critically endangered species recovery and rehabilitation of the plants and animals. The Zoo will also act as Rescue and Rehabilitation Centre for injured, sick and Care Centre for court properties.

1.6 Objectives:

Following are the main objectives for developing and maintaining this facility.

(i). To provide formal and informal conservation education to the public including school children and younger generation for conservation of wild life and to provide basic information about wild animals and their natural habitat so as to influence people's behaviour and values for their effective *in-situ* conservation.

(ii). To carry out planned Conservation Breeding of targeted rare, endangered and endemic species of the region with the intention of reintroduction into the wild and maintain insurance population of endemic species through cooperative *ex-situ* population management by coordinating at regional and global level . Further the Biological Park shall maintain insurance population of endemic species of these Islands, which can be viewed for conservation breeding and its release in wild in case of requirement.

(iii). To carry out research on animal behaviour, nutrition, reproduction, wild life ecology and management, animal genetics and disease etc and to create infrastructure for data storage, training of personnel for research related activities and to make sound decisions based on scientific knowledge for wildlife management in *ex-situ* and *in-situ* conditions.

(iv). To house the rescued wild animals which have been displaced from the natural habitat due to human interference or other reasons for their rehabilitation and reintroduction into the wild.

(v). To convey message of the Conservation, creation of species specific management data base for conservation of wild population. The Stud Books and rescue and conservation breeding programmes will enable sustenance of wild population.

I .7 Physical Features

1.7.1 Topography

The Terrain of the area is irregular and undulating, covered with lush semi evergreen and moist deciduous forests. The main hill range of the area runs North to South along the east coast. Minor ridges run in all directions at frequent intervals giving rise to narrow valleys. Wide flat area, having patches of mangrove swamps and rocky coastline with sandy beaches are present in the South-East. Some of the mangroves have been damaged due to earthquake & *Tsunami* of December 2004. The general aspect is to the East and West as the hill ranges run from north to south.

1.7.2 Geology

The geological formations of these Islands are mainly responsible for the soil types and are a key deciding factor for the forest types of the area. Climate, ground water conditions, aspect and steepness also influence the soil types of this area. The Park area has marine sedimentary group of rocks which belong to Pliocene age. While the east and north – eastern part of the Park is covered by Pillow lava of Cretaceous age. The sedimentary rocks are rich in clay and devoid of fractures and fissures while the latter is having fractures, which form pathways for downward movement of ground water to the deeper reservoirs.

1.7.3 Rocks and soil

The rocks are comprised of two main types:

(i) The serpentine series and

(ii) The sedimentary series

Soil cover is rather thin, varying from 2m to 5m. It is mostly diluvial on hilltops and ridges and alluvial in valleys. The coastal flats have an admixture of sand, silt clay and diluvial material with fine fragments of coral lime stone. The soil is, in general, mild to moderately acidic with humus on top.

1.8 Flora and Fauna

1.8.1 Flora

The important forest types as per Champion & Seth classification in the area are,

(a) Andaman Semi-Evergreen Forests (2A/C1)

These are luxuriant types of forests with many giant trees both of evergreen and deciduous nature occurring in valleys. Climbers are often heavy. Major species include *Dipterocarpus Spp.*, *Pterocymbium tinctorium, Terminalia bialata, Terminalia .procera, Albizzia lebbek etc.*

(b) Andaman Moist Deciduous Forests (3A/C1)

Top storey is irregular with tall deciduous trees followed by a second storey that comprise numerous species including some evergreen trees. Major species includes *Pterocarpus dalbergioides, Terminalia bialata, Terminalia manii, Terminalia procera, Pterocymbium tinctorium, Tetrameles nudiflora, Dillenia pentagyna* etc.

(c) Littoral Forests (4A/L1)

The Littoral forests occur all round the coast wherever a fair width of sandy beach occurs. *Manilkara littoralis* is the most characteristic species found in this type of forests. Other species includes *Scaevola frutescens, Hibiscus tiliaceus, Morinda citrifolia, Terminalia catappa, Pandanus tectorius* etc.

(d) Mangroves

As per available information from various sources 27 tree species, 5 shrubs, 1 climber and 2 species of palms and ferns each, belonging to 17 genera are reported to occur in the mangrove ecosystem of these islands. The important species occurring in the area are *Rhizophora mucronata, Rhizophora apiculata. Avicennia marina, Bruguiera gymnorrhiza etc.*

1.8.2 Fauna

Influenced by faunal distribution of both Indo-Chinese and Indo-Malayan regions, a unique and varied animal life both terrestrial as well as marine is apparent in these islands (Annexure - 4, (Table -1)Page No. 103). Geographic

isolation of these truly oceanic islands has resulted in high degree of endemism. The surrounding seas are equally rich in marine biodiversity. Endemism is more pronounced in land animals. Many of the faunal species, which occur in the South Andaman Islands, are also reported at Chidiyatapu (Also refer Annexure – 22 & 23(Table-19) Page No. 122 to 130.

The islands are also having many introduced species, mainly birds and mammals. Some of which have become invasive and problematic. Following is the list of main introduced species of mammals in the islands apart from dogs and cats:

i. Spotted deer (South, Middle and North Andaman)
ii. Barking deer (South, Middle and North Andaman)
iii. Hog deer (South and Middle Andaman)
iv. Feral Elephants – (Interview Island and North Andaman)
v. Feral Goats (Barren)
vi. Feral Buffalos (Kamorta Island)

1.9 Climate

The climate is wet tropical. It is warm and humid for most part of the year. The temperature ranges from 18º C to 34ºC. The seasons can be divided into rainy and dry seasons. Extreme winter and summer are practically unknown but there is a general nip in the air during three months i.e. December, January and February. Mists hang over the forests, particularly over openings in the forests during these months**.** The humidity is high varying from 66 to 85%. The month of March, April, May and October can be un-comfortable due to high humidity although temperatures are not high. The relative humidity is greater in the evening than in the morning. In normal conditions the wind speed is fairly constant (5 knots per hour) but during cyclonic weather it may go as high as 120 to 130 knots per hour.

1.10 Rainfall

An average rainfall of over 3000 mm per year is received during main southwest monsoon that brings most of the precipitation, which extends from May to September and northeast monsoons from November to December. The rainfall is extended over a period of eight months although it may vary from place to place. There are 170 rainy days on an average.

1.11 Season

Two seasons namely rainy season and summer season occur in these islands. A long dry season starts around January and lasts up to April /May.

1.12 Approach

The Biological Park is located at Chidiyatapu, the southernmost tip of South Andaman island. The place is well connected by road. The road distance from Port Blair to Chidiyatapu is about 25 km. The road leading to Port Blair from Chidiyatapu is the Andaman Trunk Road, designated as National Highway No 223 is having a right of way of 30 m. (Map - 2, Page No.81)

1.13 Demography of the surrounding Area

There is one village namely Chidiyatapu situated on the western side of the Biological Park. The total Population of the village is about 1500. The village is run under the Panchayati raj system presided over by the Pradhan and his ward members. The main source of revenue for the people is fisheries and agriculture which includes cultivation of cash crops and paddy cultivation.

1.14 Legal status of Land

The Biological Park is spread over an area of 40 Ha carved out of the Chidiyatapu–Bimblitan Reserve Forest Block No-1. The adjoining area of over 440 ha is a Reserve Forest. The approval of Ministry of Environment and Forest, Government of India for diversion of 40 ha area under Forest Conservation Act 1980, was received in 1997 vide letter No.8-215/92-FC dated 3.1.1997 (Annexure -2, Page No.99).

1.15 Sources of pollution

The Park area is located in Chidiyatapu–Bimblitan Reserve Forest Block No-1, away from the main city and the settlement area being limited to less than 2000 people, there is very little pollution in the area except to some extent due to movement of vehicles coming from Port Blair and some fishing boats which operate from Chidiyatapu. The pollution caused by these vehicles and fishing boats do not pose any serious potential threat to the animals of the Biological Park as the pollutants emitted by them are negligible and enclosures are considerably away from the source. Measures such as placement of boundary wall, vegetation cover and regulation of traffic are taken to further reduce the impact of pollution.

1.16 Present Ground Situation

The entire 40 hectare area of the Biological Park is protected with a 3 meter high boundary wall with a total perimeter of about 2.6 kms. A small portion of about 400 m of the wall facing the sea, which got damaged in December 2004 is presently having a double galvanized chain link fence. The area is forested having undulating terrain, with three seasonal streams running through it. Four small ponds covering an area of 1147 sq. mts have been created inside the area. Three kms of water-bound Macadam road is constructed inside the Park. Water is scarce during the main summer season between January and April, when practically no rain occurs in the islands. In order to overcome the problem, a two km. long network of water pipeline has been laid inside the Park connecting the existing enclosures to the main tank which is having a storage capacity of 50,000 litres. Three major check dams/weirs have been recently constructed on the main stream which is draining the Bimblitan Reserve Forest close to the Biological Park. The total water holding capacity of these check dams is about 8 Million litres and water to the Park will be provided from these impoundments during the summer season. One Forest Rest House having five suits is available adjacent to the Park.

Initially nine enclosures were constructed. The first Section is for display of reptiles with the first enclosure with an area of about 3091 sqm is for the Saltwater or Estuarine Crocodile (*Crocodilus porosus*), while the second enclosure is for the breeding pair of crocodile, with an area of about 1760 sqm. The third enclosure of water monitor lizard (*Varanus salvator andamanensis)*, is having an area of 238 sqm. Mammals are displayed subsequently with the fourth enclosure for the Andaman Wild Pig (*Sus scrofa andamanensis)* has an area of about 2972 sqm. The subsequent enclosures are a little away as the large enclosure meant for Sambar with an area of about 15784 sqm in between is now proposed to be converted into a Plant display area. The remaining four enclosures are meant for Spotted deer (*Axis axis*) with an area of about 11347 sqm., the Barking deer (*Muntiacus muntjak)* with an area of 2721 sqm, the Hog deer (*Axis procinus)* having an area of about 4648 sqm and the Crab eating macaque (*Macaca irus umbrosa*) which has an area of 2785 sqm. The Park is presently displaying only five species of animals namely Andaman Wild Pig, Crab Eating Macaque, Spotted deer, Water Monitor Lizard and Salt-water Crocodiles.

The major facilities for proper care of the animals which have been completed include a modern Veterinary Hospital and a well equipped feed preparation complex. The visitors' amenities provided consist of a Cafeteria, a Public Toilet, Children's Park and Parking area for vehicles. These facilities are situated outside the main entrance gate of the Park. While inside the Park a number of rest huts and sheds, drinking water outlets, benches and signage have been made for visitors. The administrative facility includes Deputy Director's office which also has the Range office and office for the support staff, and is situated just outside the main gate. The other infrastructure facilities are the main Store Godown and the Staff Quarters which have been completed and are also located outside the Biological Park. The Biological Park has been made self sufficient and all the basic amenities for the staff and visitors are either completed or nearing completion.

(a). Enclosures:

As detailed above, eight animal enclosures are fully developed and enrichment activities have been completed inside these enclosures. Animals are displayed in six of these enclosures and efforts are being made to procure remaining two species namely Hog deer and Barking deer, which still occur in some pockets in the forests of South and Middle Andamans. The details of all the completed enclosures is given in (Annexure – 5 & 36(Table-2), Page No. 104-105 & 154-158) and layout of these enclosures is provided in (Map – 6 & 7 Page No.85 & 86.).

(b). Administrative buildings and other infrastructures:

The Deputy Director's office, Store Godown, Veterinary Hospital, Staff Quarters, Feed preparation room, water storage and distribution system and the main entrance gate have been completed. Details are provided in the (Annexure – 35(Table-32), Page No. 153,) and (Annexure – 36(Table-33), Page No. 154-158, Map - 6 & 7).

(c). Visitors' amenities:

To provide appropriate amenities to the public, the following facilities have been provided inside and outside the Park:

- **Outside the Park**. Forest Rest house with five rooms accommodation of VVIP Standards, a Sunset view point , beautiful sandy beach with 2.7 km trecking path, Swimming facility at the beach with fresh water and toilets, Cafeteria, Public toilet with facilities for physically handicapped persons, Children's Park, Parking Space, Entrance gate with ticket counter, security room with locker facilities and Gift Shop.

- **Inside the Park**. Aqua guard drinking water cooler & tanks, Sit out Benches, Rest Huts, tiles paths to avoid snakes, Battery operated vehicles, Binoculars for bird watching, wash rooms and sheds have been developed inside the Park. The details are provided in Annexure – 11 & 12 Page No. 90 & 91 in Map – 11 & 12**.**

(d). Electricity:

Electric connection is provided to Office of Deputy Director, Store Godown and all the quarters of the residential area and street lights have been provided to the residential area. Electric connection has been provided up to the main entrance gate of the Park and will be extended inside the Park for better management. The existing and proposed electrical supply lines are shown in (Page No. 87 Map - 8).

(e). Water Supply:

Water is scarce during the peak summer season between January and April, when practically no rain occurs in the Islands. In order to overcome the problem, a 2 km long water pipeline has been laid inside the Park connecting the existing enclosures to the main tank which is having a storage capacity of 50,000 litres. Three major check dams/weirs have been constructed outside the Park on the main stream draining the Bimblitan Reserve Forest with the total water holding capacity of over 8 million litres of water, through which water will be provided to the Park during the pinch period. The layout of water distribution system is provided in (Annexure – 9, Page No.88, Map - 9). The present and projected annual requirement of water is about 255 million litres and the present water supply and storage is about 1.4 billion litres from the existing water supply line, water storage tank inside the Park and 3 check weirs outside the Biological Park. In addition to these, Park plans to develop underground rain water harvesting tanks in all the future buildings having a capacity of 20 to 40,000 litres for storage of additional water for use during the main summer season between February-May. There is also a plan to set up 2 bore wells and additional ring wells at appropriate locations away from the sea to utilise ground water to take care of the demand of water in the Park during the summer season. The water from the wells will be pumped to storage tanks for treatment by R.O. treatment plant set up near the storage tanks and then it will made available for distribution. None of the enclosures except that of the Wild pig

are having a wet moat and therefore the need for water is not that much which is being met from the storage tank opposite to the Wild pig enclosure, while the dry moats serve as additional rain water storage areas. For the two Salt-water Crocodile enclosures, sea water is being used in the water body of the enclosures. The water monitor Lizard enclosure requires supply by the water tank, which will be met from these wells.

(f). Funding sources.

Funds necessary for operation of the Biological Park, Chidiyatapu is sole responsibility of Administration of the Andaman and Nicobar Islands. The details of funding for various work of the Phase I work is given in (Annexure - 37, Page No.158, Table - 34). Funding for the Canopy Walkway Project has been received from the Department of Tourism under the Tsunami Rehabilitation Programme (TRP). Provisions are being made in the future proposal for the development work the zoo from the State Plan fund.

1.17 Layout of the Biological Park.

The present layout of the Biological Park is given in (Annexure – 6 & 7, Page No.85-86, Map – 6 & 7) on a 1:1000 scale. The entire Master Plan is digitized and maps can be produced in any scale on GIS mode for ease of planning and clarity. As per the CZA Guidelines, the completed enclosures are shown in black, the new enclosures of are shown in blue. The enclosures to be modified have been shown in green. The thematic criteria for display of animals is the evolutionary pathway starting from lower animals such as Insects, followed by Fishes, Reptiles, Birds and Mammals. The visitors" circulation plan is shown in (Annexure - 11, Page No. 90, Map - 11).

1.18. Difficulties faced in the management in the past and achievements.

The Biological Park is situated 25 km from the city; as a result it becomes difficult to pool in resources and to get man power to carry out the construction and other related activities inside the Park. The lack of a comprehensive Master Plan to guide the development work was also a reason for not taking up the activities in a planned and time bound manner. Lack of locally available technical help in designing the enclosures and difficulty to get the available technical help from mainland as and when required was also a major impediment in the proper development of this Park. Lack of water within and in the vicinity of the Park was another major problem for taking up construction and maintenance related activities during the Phase-I. During the development of the Biological Park the mega earthquake and resultant *Tsunami* of 26th December 2004 caused damage to some enclosures and other facilities under construction and also resulted in subsidence of land in some parts of the Park. Subsequent diversion of resources and manpower for relief and reconstruction work was a further set back, due to which many of the completed facilities which were damaged could not be re-constructed in time and resulted in further delay of over two to four years in all the on-going works.

Chapter II

APPRAISAL OF THE PRESENT ARRANGEMENT AND CONSTRAINTS

2.1 Exhibit Section

The exhibit section is directly supervised by the Deputy Director, Range Officers and Section Officers of Biological Park. The tasks of Section Officers of the Animal Section involve maintenance of the Biological Park in a broader way which includes the health and well being of animals, the feed and nutrition of animals and hygiene of the enclosures and animal houses including the safety and security of the enclosures. He also keeps records of the inventories of the animals, the feed and medicine prescribed to the animals from time to time, the cases of birth and the mortality etc. Besides, the enumeration of the floral species found within the Section, their identification, naming and maintenance also falls under his purview. In order to provide better management within the Park; a set of enclosure and designated area is under the control of a Section Officer, who is in the rank of a Forester or a Forest Guard. The exhibit section will also be monitored

2.1.1. Animal Section

The park follows the dictum that the ***"Exhibits are the outward manifestation of an institution's soul".*** The animal section is the most important section and requires high order of management to have insurance population. While attempts are made to provide open air enclosures for most of the endemic species with a dry or wet moat barrier, other types of barrier like chain link mesh fence, glass or wall is used wherever felt necessary. Design of animal enclosure needs to be friendly which serve the needs of animals, visitors and the management. An animal friendly design is one that supports good animal health, keeps animals safe from harm, promotes their natural behavioural patterns, creates an environment for ex-situ conservation and supports easy servicing and maintenance. It needs to provide visitors proper viewing, keep them safe from harm and displays necessary information. Therefore an animal enclosure must provide a suitable habitat for the animal to thrive and express as much of its natural behavioural repertoire as possible, provide a safe working environment for the Animal Keeper and also be an attractive and educational exhibit for the visitor. All enclosures shall be provided with environmental enrichment giving adequate protection to the animals. Wherever necessary inbuilt squeeze cages should be attached to the animal houses for restraining the animal for providing in-house treatment and when necessary to capture it for transportation to the Park hospital without putting the animal to undue stress.

(A). Completed enclosures of the Biological Park during Phase-I:

A.1. Main Salt Water Crocodile enclosure (Modified turtle enclosure).

The enclosure was earlier meant for turtle but due to its big size and inadequacy to provide under water viewing facility it was decided to convert the enclosure for the use of crocodiles. The enclosure has a wall on all sides and two

islands at the centre for basking of crocodiles. The enclosure has a secure door for the Animal Keeper to enter inside the enclosure. All the required enrichment activities have been taken up by providing two islands for basking along with planting of natural vegetation of coastal areas and creeks on the side of the large water body which covers almost 70% of the area of the enclosure which has an area of about 3091 Sq.m. The enclosure has salt water intake facility and a safe entry gate for the keepers. Two secured glass windows have also been provided in the wall along the viewing gallery down below for closure viewing; although main viewing platform is at a vantage point overlooking the entire enclosure on the main road giving a panoramic view of the enclosure with a back drop of sea and Rutland Island to the visitors. It presently houses 9 animals (1 male: 8 females).

A.2. Salt Water Crocodile enclosure (Breeding Enclosure):

This enclosure was constructed for housing all the crocodiles for display but due to the availability of bigger modified turtle enclosure adjacent to it for housing the majority of the crocodiles available with the Mini Zoo, Haddo, this enclosure is now used for keeping the main breeding pair for conservation breeding of crocodiles. It has sea water intake facility and a large vegetated island in the centre for basking of crocodiles. The area of the enclosure is 1760 sqm. and it houses 3 animals (1 Male: 2 Female) including the largest male crocodile measuring 4.60 m.

A.3. Water Monitor Lizard enclosure:

The enclosure is completed and originally had only one glass window for viewing the animals on the north east side of the enclosure. However in order to allow easy viewing of animals to the public, a board walk in RCC has subsequently been constructed towards eastern side and one more glass window was fixed on the north east side. One island is developed at the centre of the enclosure with a water trough around it. In addition enrichment works have been taken up like planting of saplings, placing of hollow logs and other cage furniture etc. The area of the enclosure is 238 sqm and houses 4 lizards (2 males: 2 females).

A.4. Wild pig enclosure:

The enclosure was fenced along three sides with wire mesh and one side with V Shaped shallow wet moat. The moat width is 4 m through which a seasonal stream passes, keeping it water filled for almost 10 months of the year. The area is slightly sloppy towards east. Stone pitching of the moat has been done. Soil conservation work has been taken up for arresting the erosion and stone pitching has been done in the moat. The built up dimension of the Animal House is of 11 m x 5 m with 2 cells of the 2.60 m x 1 m x 1.25 m each. Additional enrichment works including terracing, planting and construction of a wallowing pool etc has been carried out. The wild pig enclosure with an area of 2972 sqm presently has 2 sub adult wild pigs (1 Boar: 1 sow).

A.5. Crab eating macaque enclosure:

The enclosure has a 5 m high boundary wall which is raised on the three sides and a wet moat with a moat depth of 3m and a moat width of 5m made on eastern side. The area is sloping towards east and one Island has been made inside the enclosure. To prevent soil erosion, a 2 m high retaining wall has been raised all along the other side of the water body of the moat and stone pitching has been done to avoiding sliding and soil erosion. There is an animal house having a covered area of 9.30 m X 4.40 m with 2 cells of the dimension 2.40 m x 2.80 m x 2.90 m each. Additional enrichment works including terracing, planting of suitable trees and shrubs, cage furniture and fixtures has been carried out. The enclosure with an area of 2785 sqm presently houses 10 animals (8 males: 2 females).

A.6. Spotted Deer enclosure:

The enclosure was fenced along three sides with wire mesh and on the viewing side a dry moat is constructed. The moat width is 4m. On the visitors side effective barrier with stand-off railing and hedges have been provided for a natural look and visitor's safety. The enclosure area is sloppy towards west and due to heavy rain coupled with movement of animals prone to soil erosion. Soil conservation work has been taken up for arresting the erosion and stone pitching has been done along the side of the dry moat. The Animal House is having a covered area 11.15 m X 5.05 m with 2 cells of size 2.60 m x 1.05 m x 1.25 m each. As the climate of these islands is more or less equitable with no winters or harsh summer, there is no need for a night shelter and the animal house are meant for handling animals in case of emergencies or special care. Additional enrichment works including terracing and planting has been carried out. The spotted deer enclosure with an area of 11347 sqm is housing 46 animals (17 stags, 23 hinds and 6 unsexed fawns).

A.7. Barking deer enclosure:

The enclosure is fenced along three sides with wire mesh and on the viewing side it is having a dry moat. The moat width is 4 mtrs. From the visitors side, effective barrier with stand-off railing and hedges have been provided for a natural look and visitor's safety. The area is sloppy towards north-west. Soil conservation work has been taken up for arresting the erosion and stone pitching has been done along the moat. The Animal House is having a covered area of 11.15 m X 5.05 m with 2 cells of 2.60 m x 1.05 m x 1.25 m each. Additional enrichment works including terracing and planting has been carried out. Presently no animals are on display. This enclosure has an area of 2721 sqm.

A.8. Hog deer enclosure:

The enclosure is also fenced along three sides with wire mesh and on the viewer side it is having a dry moat. The moat width is 4m. and it also has an

effective barrier with stand-off railing and hedges have been provided for a natural look and visitor's safety. The enclosure area is steeply sloping and soil conservation work and stone pitching has been done along the moat. The Animal House is having a covered area of 11.15 m X 5.05 m with 2 cells of 2.60 m x 1.05 m x 1.25 m each. Additional enrichment works including terracing and planting has been carried out. Presently no animals are on display. This enclosure has an area of 4648 sqm.

A.9. Sambar deer enclosure (Modified to Plant Section):

The enclosure is fenced along three sides with wire mesh and one side having a dry moat with stand-off barrier and hedges for a natural look and visitor's safety. The area is slopping towards east and eastern side is more or less levelled. As the plan to house Sambar deer has been dropped, considering the existing vegetation inside the enclosure, its terrain and landscape, the enclosure is proposed to be used for displaying endemic plants of Andaman & Nicobar Islands and therefore the area in now earmarked and developed into a special Plant Section with a trekking path of 480 metres and using the animal house as information centre for plant diversity of the islands.

The remaining enclosures such as Walk in Aviary, 12 Terrestrial Bird enclosures 12 enclosures in Reptile Houses (Reptile house for lizards, skinks and geckos, 12 enclosures in Serpentarium for snakes and 2 enclosures Fresh-water Turtle house), Marine Aquarium in the shape of swimming pool with an underwater glass tunnel and Marine Turtle Rehabilitation Centre (marine section), Nocturnal animal house in the form of 4 small underground caves, etc. will be coming up in future and explained in detail in Part-II of the Master Plan.

The inventory of animals as on 31.08.2016, at the Biological Park, Chidiyatapu is at ANNEXURE-3.

Constraints: Availability of the technical expertise for designing and execution of quality work inside the dense forests is a constraint. Electricity supply is another.

2.1.2. PLANT SECTION

Plant Section is purely natural forest, which further will be enriched with endemic species as per classification.

2.1.2 a. <u>Plant Section inside the enclosed area</u>

The site is blessed with four different forest types found in these islands viz the
1. Andaman Semi Evergreen Forests
2. Andaman Moist Deciduous Forests
3. Littoral Forests and
4. Mangroves.

Owing to the above, there is ample scope and opportunity to throw a spot light on the unique and endemic floral diversity existing in these islands. However, due to the shortage of technical expertise in this field, much progress could not be made so far. However, by using the traditional knowledge and experience of the workers and the staff, most of the commercial trees were enumerated and identified with their vernacular as well as the scientific names. Eventually, the trees that are located in the vicinity of the roads have been provided with boards depicting their vernacular names, scientific names and Family. The plant section will be a miniature botanical garden representing and accommodating the genetic diversity of plants present in the Andaman and Nicobar Islands. The diversity of plant life from trees, shrubs, herbs, medicinal plants, bamboos, orchids, palms, climbers, creepers, parasites etc, are given special attention for the display.

2.1.2 b. Plant Section and Green Belt outside the enclosed area

The tourism potential in this area has increased manifold. The upcoming beach facilities, trekking and snorkelling facilities nearby has been attracting many tourists to this site. For better management of the plant resources of the Biological Park the adjoining forest area of Chidiyatapu-Bimblitan Reserve Forest Block No. 1 will act as a greenbelt for the Biological Park which is approximately 335 ha.

The layout of plant zonation for display area will is based on the evolution of life on earth. The tree species in the reptile zone will be those species of Jurassic era with *Cyacas rumphii, Podocarpus* spps, Tree ferns like *Cyathea* spps etc. to give appearance of visitor being inside Jurassic age. The crocodiles are having mangrove forests and littoral forests. The tree species in bird's zone is secondary moist deciduous forests and semi evergreen forests. Tree species in mammal zone is also same as bird zone. The tree species in insect and butterfly zone are also secondary Moist Deciduous Forests and Andaman Semi-Evergreen Forests. Further there will be separate zones for palms, canes, bamboos and ornamental plants with special attention for endemic threatened and rare plants.

Constraints: The weather plays an important role in managing the display of the animals in the park. During rainy days, water moisture with the surface soil is sufficient for plant growth. Off season (non rainy days) water to plants is a constraint and forest loose 50% of foliage during the period ranging from December to April.

2.1.3 Orchidarium:

One of the economically important groups of plants in the world, Orchids are the queen of Plant Kingdom. After North East India and Western Ghats, Andaman & Nicobar Islands represent a good repository of tropical orchid species. The total number of orchid species recorded from these islands is over 120 species with further scope for new additions and records. This orchidarium will house all the four

types of orchids available viz, epiphytes, saprophytes, lithophytes and ground orchids. An orchid house has been constructed in the Biological Park and few of the orchids have been collected for display. A detail of various species of orchids found in the islands is given in (Annexure - 26, Table-23).

In addition to the orchidarium, all major trees growing inside the Park are provided with name plates for identification and on-site information boards are being prepared to give more information about the key species. Main Plant Section which will be displaying the important endemic plant species of the Andaman and Nicobar islands will be developed during the Phase-II of the Plan for which the earlier constructed Sambar Enclosure is earmarked for development. Details of the same are given in the Part-II of the Master Plan.

2.2 Veterinary Section

Wild life health is an important and Critical component of a Zoo management and is given top priority in the management of zoo. Veterinary input involves the treatment and evaluation of diseases and illnesses and control of parasites and pathogens in animals and ensuring that there is no diseases stress or injury problem in the displayed animals. Ex-situ management of wild life health is an important issue which helps in the in-situ conservation of wildlife populations.

Presently the Biological Park has no Veterinary Officer but the veterinary officer posted at mini zoo, Haddo is assigned to look after the Park and Veterinary Officer of the Animal Husbandry Department A& N Administration regularly attends the Park animals. The Head Veterinary Compounder (HVC) posted at the Park coordinates for regular health check-up of the captive animals. The veterinary hospital has been constructed with an inpatient ward for animals. The purchase of veterinary equipment is being done as per the requirements to make it full-fledged for health care. Details of up-gradation of this section have been indicated in Part-II of this plan.

The Health Advisory Committee has to be constituted for which necessary steps have been initiated. The construction of post-mortem room and inpatient ward has been completed whereas construction of quarantine facilities will be taken up. Regular observation, health check-ups, faecal examination, blood analysis etc are carried out in collaboration with the Department of Animal Husbandry and ICAR. As per the CZA guidelines, records namely Animal keepers' Diary, Daily Report, Animal History Cards, Treatment Card, Stud Book, Inventory Register and Post-mortem record are maintained. The Animal Record Keeping System (ARKS) for identification of animals is maintained in the Park. These records are presently maintained by a Section Officer under the supervision of Range Officer (Animal Section) and reviewed by the Deputy Director of the Park.

Constraints: The veterinary section management with full fledged staff can be put into service once it is complete in all aspects. The Veterinary Officer of the

department as well as the veterinary officer of the A N Administration both attend to the needs by frequent visits as and when needed.

2.3 Store and feed supply section:

Store section helps in keeping reserve stock of both perishable and non perishable items, so that a continuous supply of feed materials is available to the animals and to meet the needs of animals in cases of emergencies. A well furnished feed preparation room with all the basic facilities has been developed inside the Park .The location of kitchen near the emergency gate helps in easy unloading of feed material into the store section of the feed preparation room.

The Camp Officer, Animal Section keeps the stock of perishable and non perishable food items and issues it on a daily basis as per the guide lines laid down by the veterinary doctor. The feeding material is kept at the feed preparation room and the perishable items are kept at the freezer room. The food for all the animals is cooked in the kitchen (feed preparation room) in a hygienic manner and is then distributed by the animal keepers inside the enclosure. Strict hygienic measures are followed during the feed preparation and a balanced feed as per the nutritional requirements is given to all the animals. Besides, fodder such as Jungli aam (*Mangifera andamanica*), Nabbe (*Lannea coromandelica*), Buckripathi (*Trema ambionensis*) that are easily available in plenty outside the Park are collected to feed the deer species. This diet chart has been prepared in conformity to the diet chart prescribed by the Senior Veterinary Officer of the Forest Department. Before feeding the animals the quality of the feed is assessed by the officer in charge so that best quality hygienic feed with proper nutritional feed supplement and salt lick is given to the animals. Tree fodder is provided to the animals so that the general health of the animals is maintained. Accordingly, for the ungulates, the ingredients mentioned in the chart are cooked and supplied to the animals. In case of the Andaman Wild Pig the ingredients are provided raw and is supplemented with raw vegetables *viz* Tapioca, Coconut kernel, Pumpkin and Yam bought from the market. The Salt water crocodiles are provided with beef at an interval of seven days. The feed is procured from the market by inviting tender and the concerned firm whose tender is accepted by the Competent Authority supplies the feeds for the entire year. A balance diet consisting of bread, bananas, cucumber, Bhaji and whole gram is fed to the monkeys in the enclosures. A Store Godown for Construction Section has been constructed to store all the items related to construction and maintenance activity of the Park.

Constraints: Feed of inadequate quality in market without any competition is the main constraint for feed supply. The humid weather does not permit huge storage of feed articles.

2.4 Sanitation Section

Sanitation is an important aspect of Park management, as it helps in keeping the surroundings clean and prevents the spread of diseases in the displayed

animals. With the increasing threat of new diseases and outbreak of epidemics it becomes even more important to give top priority to sanitation in Park management.

Sanitation includes daily cleaning of the animal enclosures and disinfection, disposal of the faecal and feed refuses, cleaning of water pools, day cages & periodical disinfection of moats by application of lime, bleaching powder and weed removal etc.

Disinfection Schedule

1. Daily cleaning of all the animal enclosures; feeding and watering tubs with disinfectants.
2. Daily cleaning of drains thoroughly
3. Daily disposal of faecal & feed refuses
4. Weeding, cleaning debris, foreign particles in enclosures and sprinkling bleaching powder in drains

Compost pits have been developed so that all the leaf litter and other solid wastes can be disposed there and latter used as manure for nursery etc. Foot baths containing formalin solution have been developed in the entry points of all the enclosures to prevent the spread of infection inside the enclosures. A separate carcass disposal area has been identified where the dead animals are buried. Work is taken care of by some regular workers posted under this Range since the post for the sweeper(s) in the Biological Park is to be filled up. Their task involves the general cleanliness of the outer area and inner area of the Park, cleaning the animal houses, feeding troughs and the created water holes inside the enclosures. A separate sanitation wing is established with an officer in-charge to look after sanitation section.

Constraints: Availability of adequate trained man power to handle sanitation works is a hurdle. Mindset of the personnel involved in sanitation work is a big hurdle.

2.5 <u>Maintenance Section</u>:

The Park requires regular maintenance of its infrastructure which includes the maintenance of the mesh of all the enclosures, moat walls, road, gardens, thinning, weeding, and other activities, which are carried out by the regular workers of this Park from time to time. There are regular and daily rated workers along with few designated ones who keep a fair knowledge in carpentry and masonry works. These workers are engaged daily by the Camp Officers for performing different works in the Biological Park on a priority basis. A complete work shop with all the equipments and tools for the fabrication and maintenance of the enclosures will come up in the next phase of the Park for maintenance purposes inside the Park.

Constraints: Availability of adequate trained man power.

2.6 Security section

The following steps have been taken to maintain the safety and the security of the Biological Park.

2.6.1 Boundary Wall and Gates:

To provide physical safety and security to the Park and to prohibit trespassing by cattle and intruders, a 2615 meter long and 3m high permanent boundary wall has come up all around the Park. The construction of the boundary wall has been done in four phases, out of which Department has already constructed the first three phases whereas the fourth phase has been got completed by the Andaman & Nicobar Islands Forest and Plantation Development Corporation (ANIFPDC). About 400m of the boundary wall of Phase-IV that is adjacent to the sea, which got damaged during Tsunami in year 2004 has been reconstructed with double galvanized chain link mesh as per the recommendation of the CZA. An entrance gate with ticket counter and security guard room has been developed on the western side of the Park .Two Service gates, one in North-West and another on southern side of the Park have been constructed. The entry through the service Gate is restricted only to the permission holders and the staff and workers related to the area.

2.6.2. Watch & Ward Personnel

There are regular workers to perform the watch and ward duty inside the Biological Park round the clock in three shifts. Besides, during the night hours the executive staffs have been assigned the duty of night patrolling for the safety of the Park. For ensuring the safety and security of the captive animals, workers are put on 24 hours watch and ward duty. A monthly duty chart showing the duty of each worker and executive staff of Animal Section is provided so that round the clock security is provided to the animals.

Constraints: Availability of adequate trained man power.

2.7 Water Supply Section:

An overhead tank with 50,000 litre capacity has been constructed and a 2 km pipeline has been laid inside the biological Park connected to the overhead tank which provides water to the animals in the enclosure. Also 3 check dams (RCC weir) have been constructed which has a water holding capacity of 8million litres, near the Park to meet the future water demands of the Park.

Large quantity of water is required for animal house cleaning, staff quarters, watering the garden, drinking purpose and for toilets. Water is also required for the moat of the Wild Pig enclosure during dry period. To tide over the shortage of water

supply in summer season, a water tanker vehicle is available to meet any emergencies for bringing water from nearby water sources. The existing well near the Forest Rest House is also serving the purpose of providing water to the staff and animals in case of shortage of water during summer season. Construction of two bore wells and ring wells along with rain water harvesting tanks linked to buildings inside the Park will be taken up in Phase II so that the Park will be self sufficient to provide clean and potable water inside the Park especially during the short summer season.

Three major check dams/weirs have been constructed outside the Park on the main stream draining the Bimblitan Reserved Forest with the total water holding capacity of over 8 million litres of water, through which water will be provided to the Park during the scarce period. The layout of water distribution system is provided in (Annexure - 9, Map – 9, Page No.88). The projected annual requirement of water is about 255 million litres and the present water supply and storage is more than 1billion litres from the existing water supply line, water storage tank inside the Park and 3 check weirs outside the Biological Park.

In addition to these, Park plans to develop underground rain water harvesting tanks in all the future buildings having a capacity of 50,000 litres for storage of additional water for use during the main summer season between February-May. There is also a plan to set up two more wells and additional ring wells at appropriate locations away from the sea to utilise ground water to take care of the demand of water in the future during the summer season. For the two Salt-water crocodile enclosures, sea water is being used in the water body of the enclosures. The section will be supervised by a Forester and assisted by one plumber and two multi skilled assistant.

Constraints: Availability of the technical expertise in various streams is main constraint.

2.8 Waste Management:

The area of the Biological Park at present is 40 hectares. The nutrient recycling is minimum 45 days for re absorption by plants. The quantum of sewage handled and disposed is below the requirements of a mechanical operation. The daily sewage is below 50 Kgs per day i.e. 20 tons per year. The disposal of solid wastes and liquid waste is one of the most important aspects in the management of a zoo. The solid wastes mainly include feed waste, wastes from the fodder, faecal wastes, litter wastes etc. Liquid wastes in the Park includes water from sanitation, drainage water etc.

The solid wastes are presently disposed off by putting them in the compost pits so that they can be used as manure for other activities like nursery etc. The solid non degradable waste is being is disposed through the contractor of the Andaman and Nicobar Administration to Chennai for recycling.

The liquid wastes from inmates are absorbed by plants inside the enclosures of the Park. The only enclosure with more population is of Chital which is ranging from 60-70 in an area of 11347 Sq. Mt. There are few seasonal streams draining rain water into the sea. Sewage treatment is by means of a natural treatment with the use of fresh water fish and insects in the steams and check dams. Heavy rains generally over flow the streams.

There is a mechanism of filling and draining sea water into the both crocodile enclosures through sluice gates during high tides and low tides. The abundance of Mangroves, marine fishes and molluscs in the crocodile enclosures keep the enclosures clean and thus providing a naturally clean environment for the crocodiles. The environment inside the Biological Park for animals is absolutely natural for self established trees and plants, but for animals restricting the movement within the enclosures.

Few check dams have come up enabling the storage of rain water for summer seasons for the inmates by means of R.O. water treatment plant without using chemicals inside the Park. Recycling of nutrients during rainy season is approximately two months and during dry spell it awaits rains for complete decomposition of leaf litter. It is a complete natural sewerage disposal system in the park, but a series of dustbins, cleaning and disposal of garbage by transporting them outside the Park and sweeping on daily basis is also well placed. The public toilets and the staff colony are properly and regularly cleaned. To achieve this, beside the manpower, proper equipment like leaf blowers, water sprinklers and sprayers also have been made available from time to time.

For cleaning of the Park premises including animal enclosures, contractual arrangements are being explored for minimizing establishment costs and search for such staff. There are wells for drawing water by mechanical pump to treatment plant for treating the water before release to any use. Soak pits are being created for absorbing waste water and specific area has been earmarked for the visitors for eating food brought with them. Two waste disposal pits one inside the park premises has been made near the feed preparation room for disposal of biodegradable solid and liquid waste and another waste disposal pit behind the public toilet for disposal of biodegradable solid/ liquid waste outside the park are constructed, where the wastes will degenerate through the process of natural decay.

Polythene and tetra pack are discouraged and completely prohibited inside the Park. The non-degradable waste is dispatched to State Collection Centre, Port Blair for disposal and Chennai for recycling. Composting of bio-degradable wastes is being done in the composts pits through vermin-culture. This vermi-compost manure will be utilized for enriching the garden, lawn and the fodder farm. After completion of development of the Park, the size of the future requirement of sewage treatment plant can be considered with the budget provisions from the state fund.

2.9. Amenities:

This section is classified into following two groups *viz.* Staff and workers amenities and Visitors' amenities.

2.9.1. Staff and workers Amenities

1. Accommodation:

Quarters as well as Labour Barrack has been are constructed in which 16 families of workers are residing. Besides, most of the executive staff has been provided quarters.

2. Water facility:

The water is supplied to the staff quarters through pipeline provided to the quarters from the over head tank on every alternate day. Three check viers are in place to store water for dry season. Two wells are in use with pipe water connection to all the enclosures, FRH, Drinking water facilities in the park, veterinary Hospital, Offices, Feed preparation room and Cafeteria for regular water supply.

3. Power Supply:

All quarters and building are provided with electrical connections. Two electric generators are provided for standby power supply.

4. Approach:

A Water bound macadam road is provided for the staff quarters for transport which is connected to the Andaman Trunk road. The roads inside the biological park shall be all weather fair road merging with the natural surroundings keeping in view safety and security of the visitors and the public using them.

5. Uniform:

All the executive staff of the Biological Park, Chidiyatapu is provided with Khaki coloured uniform.

2.9.2. Visitors' amenities

Visitors' management is a critical component of Park management. Therefore it is essential that the visitors who visit the Park are taken care of by providing the basic amenities for their comfort and wellbeing. Keeping this in mind the Park management has provided the following visitors' amenities inside the Park for the general public**.** As per the plan, the following amenities have been provided for the visitors in and around the Biological Park:

- Sit outs/Benches and rest huts
- Drinking water (pure and safe) with coolers and tanks
- Cafeteria & Parking space
- Public toilets
- Children's Park
- First aid and Nursing Room for medical emergency
- Vanasthali (Forest Rest House) located with the Park having 5AC suits and a dormitory with 10 beds.
- Sea view sit out benches close to long sea shore.
- Nature walks in the plant section and in the dense forests of the park.
- Battery operated vehicles for viewing animal enclosures of the park.
- Cable walks ways for viewing Butterflies, Arachnids and birds.
- Bird watch towers for bird watching and research.
- Canopy walk way for viewing birds, sea view and many more on the canopy.

The following visitor facilities/ amenities shall be provided in the Biological Park:

- Marine aquarium with marine life and other fishes.
- Visitors shed, guides for the visitors and wheel chairs for the *Divyangjan* (physically handicapped).
- For easy movement inside the Park the visitors are provided with the facilities of Golf cart, electric vehicles and bicycles.

2.10. Landscaping and Gardening Section (Horticulture Unit):

The goal of landscape is to enhance the visitor enjoyment by creating a sense of anticipation and mystery at various points within the Park especially at the entrance, between the entrance and exhibits and while walking between the exhibits and finally around the rest areas. Plants are the key features of landscape especially when effort is to replicate the various Bio-climatic or Bio-geographic Zones. The Biological Park is having a good forest cover and is suited for landscaping keeping forest types as the main theme for landscaping. The best way to educate visitors on the habitat is to place the animal in its natural/appropriate environment. Landscaping also helps in merging the exhibits with the natural surroundings. The presence of bamboo, canes, palms, climbers, orchids and fern etc help in providing an aesthetic look to the surroundings and the general landscape.

The Visitor areas which include picnic areas, rest areas, and entrance zones have been landscaped by grass pitching and by planting suitable local ornamental plants. The spaces between the exhibits which lack vegetation have been planted with trees. Efforts are made to include all the critical components ie topography, rock formations, water features such as streams, waterfalls and man-made ponds, vegetation (ground cover, creepers, and herbs, shrubs and trees) and artefacts (Lianes, Termite mounds, Buttress) in providing a natural touch to the landscape. As lot of natural vegetation exists within the premises, it lends natural greenery to the Park. The vegetation has been kept intact at most of the places. But still some

formal or informal gardens do have their aesthetic appeals to visitors and zoo inmates also. The landscaping and planting of trees will be in following manner:

(a). Forest Area:

After constructing recommended enclosures and roads to serve them, the balance forests area will be left as such to generate feeling of being in a natural forests area for the visitors.

(b). Avenue Plantation:

Number of indigenous evergreen trees and shrubs are to be planted in the near future to provide shade and greenery in the Park. The indigenous species of plant to be planted in the Biological Park is shown in (Annexure - 33, Table -30, Page No.148-149).

(c). Removal of Exotics:

There is a need to phase out the exotics, especially the weeds from the Park area through replacement by indigenous species. The Park attendants do weeding in a regular manner.

(d). Nursery:

A nursery is the absolute need for maintaining the greenery and aesthetic appeal of the Park. The developed nursery shall serve the following purposes**:**

- **Development and maintenance of lawns and Gardens:**

  Good formal gardens and lawns shall be developed and maintained near entrance, parking space, both sides of the main path and resting places inside the Park as per requirement with advice from experienced personnel in Arboriculture. Besides, wherever blank spaces may occur, they shall be planted with the indigenous species found in these Islands.

- **Horticulture / Orchard Section: Raising of Fruits and Vegetables for feeding the animals**

  Different varieties of fruit bearing trees and vegetable crops like fodder species, tubers, tapioca, sugar cane, bamboo, grasses etc will be raised in a suitable and ideal location inside the Park away from the enclosures which are required for feeding the zoo animals.

- **Acclimatization of plants**

  Whenever seedling(s) of any desirable species are brought from a different place for planting in the Biological Park, the seedlings shall be allowed to undergo

acclimatization with the microclimate of the Park for their successful raising when transplanted to the field.

- **Seed storage and Raising of seedlings:**

Since the Park is located amidst natural forest with myriads of floral species occurring naturally within, so there exists ample scope to collect the seeds during the season and store them for meeting the future needs of the Park.

- **Other section peculiar to Biological Park**

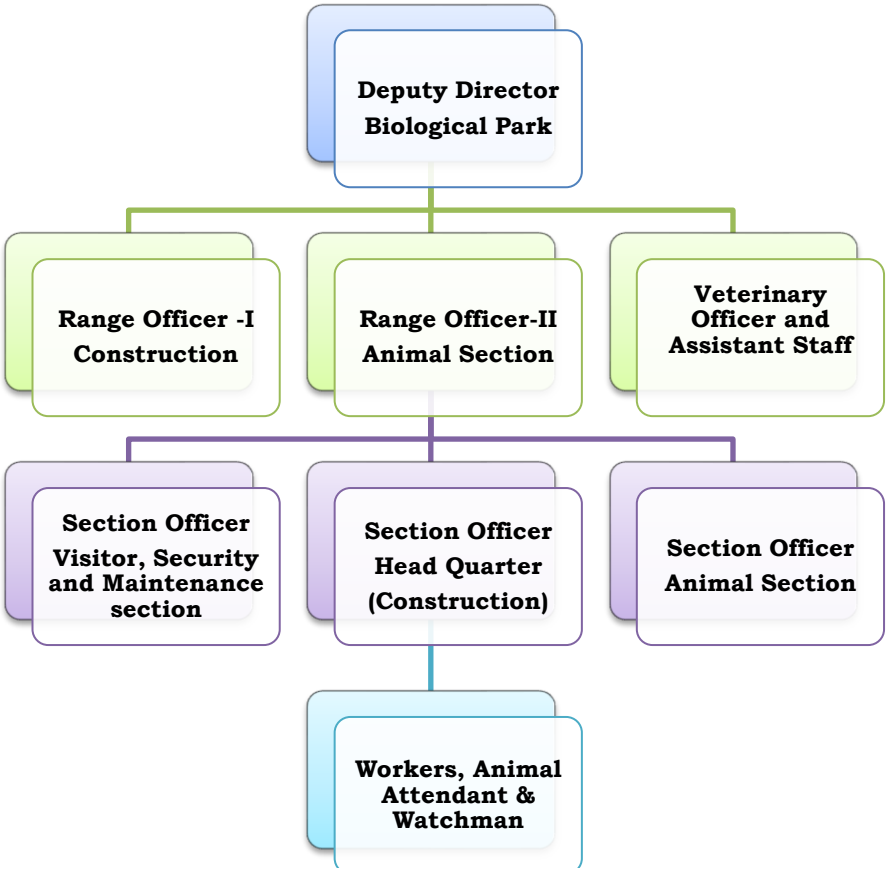
The Biological Park will be the only Park in India which will develop a Canopy Walk for the visitors. The purpose of the Canopy Walk is to provide an aerial view of the Park and to observe the flora and fauna inhabiting and visiting the dense canopy of the tropical forest trees. It will also provide an adventurous and exciting experience for the visitors in the Park.

2.11 Collection Plan:

Collection plan is a strategic planning process carried out at an institutional, regional or global level to prioritize species, which incorporates numerous factors such as conservation status, taxonomic uniqueness, education value and availability of stock.

The Zoo has taken a strategic review of the species of the animal and the number to be housed in the Park for preparing the animal collection plan. Population size for each identified species has also been taken into consideration for proper housing of the animals so that proper spacing is given to the animals. The cost of upkeep and health care of each species has also been taken into consideration in this collection plan. The species that have been identified for planned conservation breeding has been given importance so that founder population with maximum heterozygosity is obtained. The barking deer and the hog deer are planned to be acquired from the wild for which state permission has already been obtained. However, now emphasis is being laid on displaying animals and plants endemic to these islands. Mostly the local species will be collected through rescue operations and specific species to be collected with the approval of the Chief Wildlife Warden, Andaman & Nicobar Islands. Animal species to be housed in the Biological Park are listed in the **Annexure-5, Annexure-6 and Annexure-7**. Plants species to be housed in the Biological Park are listed in the **Annexure-10 to Annexure-17**.

2.12 General Zoo Administration Section:



At present Biological Park has one full time Deputy Director of the rank of Assistant Conservator of Forests who is responsible for the management and development of the Park. There are two Range officers one in charge of the Animal Section and the other is in charge of construction, maintenance, and sanitation section. There are three Section Officers in charge of Animal Section, Construction Section, and Maintenance and Sanitation Section respectively. Animal enclosures are under the control of Section Officer in the rank of Forester supported by Forest Guards. Animal Section will include Veterinary section which will be headed by a veterinarian. To carry out these works we have to appoint following designated workers *viz.* Animal attendants / Keepers, Gardeners, Guides, Carpenters, Masons, Electricians, Veterinary compounders etc. The Horticulture, Gardening and landscaping section, the Visitors' Section and Security Section are monitored by the Section Officer of Visitor & Security Section of the Park. The post of Curator, Biologist, Education officer and veterinarian are to be filled. As a stop gap arrangement, the veterinary section is monitored by veterinarians from Animal Husbandry Department assisted by the Veterinary Compounder of Forest Department.

2.13. Research:

The wild animals today throughout the globe are facing a conservation crisis and scientific research is vital to identify the challenges at hand. Ex-situ research will be able to provide excellent information for conserving of endangered species in

the wild. Keeping this in mind this biological Park has kept research in the forefront so that it can become a scientific institution to make significant contribution for scientific decisions both at regional level and worldwide. Therefore research on pure biological science, in-situ and ex-situ research and research for improving the Park have been given importance.

The Zoo has made arrangement for recording in writing the detailed observations of biological behaviour, population dynamics and veterinary care. The Park will make meticulous recording of physical activity of the animals *viz* infighting, mating, reproductive behaviour etc. Detailed record of the health of young ones including congenital abnormalities will be kept. Detailed record on healthcare and nutrition provided to the animal will be recorded for assessing the quality of life of Zoo animals.

The detailed record will be kept on the efficacy of the medicines and the vaccines in collaboration with the national referral centre i.e. IVRI for the healthcare of the animals. Also a detailed record of the effectiveness of the enclosures for providing quality life to the animals will be maintained. The scientific observations of these data collected on wild animal management will be published in local, national and international journals for dissemination and up gradation of existing knowledge on ex-situ conservation techniques. The Zoo is committed in training frontline staff to take up research and post fresh graduates in the field of wild life science and related fields to take small grant fellowships from CZA to carry out research on ex-situ conservation.

Research and monitoring is vital for achieving the various objectives of the biological Park laid down in the policies in this regard. Owing to their geographical isolation from the Indian main land, Andaman & Nicobar Islands represents many species of flora that are unique and endemic to this area. The various conservatories proposed will help researchers for doing further studies on individual species/plant groups. The Biological Park can facilitate various research programmes on its flora and captive animals in the following manner:

1. A Biologist shall be made the overall head of Research.
2. The Researcher, with the help of the other Park staff, will record different aspects of the wild animal behaviour, breeding, feeding, mating behaviour, life span, habitat preference and publish papers which should be freely available to the zoo community and others.
3. The Park should collaborate with different colleges and universities on animal and plant research and provide facility for management-oriented research, without involving any disturbance/discomfort to animals and destroying the natural environment of the Park.
4. For facilitating research, a small building or few rooms shall be set apart as a research centre with necessary furniture, equipment, glassware, microscope, incubator, refrigerator, reference books, computer etc.

5. Research can be attempted in special areas like Tree architecture, Plant-animal interaction etc.
6. Research will be targeting on those species which are endangered and face the threat of extinction

2.14. <u>Conservation Breeding:</u>

Conservation is the securing on long term, the population of species in natural ecosystems and habitats wherever possible. The primary goal for the ex-situ breeding programmes for threatened and endangered species is to support in-situ conservation. This can be done through rescue of species imminently threatened with extinction in the wild through research, education, promotion efforts that support in-situ populations.

Conservation breeding of identified endangered species will be taken up, which will be coordinated by the Central Zoo Authority for developing physically, genetically and behaviourally viable populations of healthy animals for the purpose of display in the Park. This will also act as insurance and raise stock for rehabilitating them in the wild as and when it is appropriate and desirable. The breeding aims at having desirable hetrozygosity level at the 10^{th} generation. The founder (minimum -25) which are unrelated and having high hetrozygosity of wild origin or of known lineage will be selected for this programme. To prevent homozygosity, no inbreeding will be permitted among the progeny of the same founder. An effective population size will be maintained during the breeding programme. If required action will be initiated for involving the National Referral Centre (IVRI) and Laboratory for Conservation of Endangered species (LaCONES) in the breeding programme for screening of physical health of founder animals. In case of breeding failure detailed reproductive examination will be conducted and assisted reproduction methods will be used for making the programme a success. Wild life wing of Environment and Forests, A & N Islands will be conducting from time to time, the census of wild animals to identify the species which appears to be endangered / threatened and needs immediate intervention in ex-situ conservation breeding.

The Central Zoo Authority has identified the Biological Park Chidiyatapu as a Coordinating Zoo for conservation breeding of species namely Crab eating macaque, Nicobar pigeon and Water monitor lizard.

The off display area for conservation breeding is shown in the (Annexure & Map-7, Page No.86) & (Annexure - 9, Table – 6, Page No.110) and will be taken up in the phase II of the Biological Park. Identification of founders, the marking of founders, compilation of stud book, creation of display area will be taken up shortly. Proposal has been submitted to CZA to add Narcondam Hornbill for the captive breeding programme of Biological Park. The off breeding facility is to be designed and approved by the CZA. The Park will be an institution of for recovery of

2.15. **Education and Awareness:**

Mission: ***To provide both formal and informal education in conservation of flora and fauna to all the sections of the community with an aim to influence the behaviour of individuals towards conservation and its values.***

Zoo education is a holistic discipline targeted at visitors, staff and the wider community aiming to promote an understanding and concern and respect for biodiversity, animals and the natural world and encourage action for a sustainable future. Education is a central role for the biological Park and is part of the organizational strategy. Educational goal is integral to plan collections, design exhibits, develop conservation programmes and plan visitor services .The philosophy of our Park is to incorporate the principles of environmental education and education for sustainability. This being one of the important objectives of Park management, education and awareness plays a key role in generating empathy and warm feeling towards nature and wildlife among the visitors besides making them educated about the different aspects of biology and ecology of the wildlife. The whole education program is proposed to focus on different target groups through active participation of Park and other interested stake holders. Hence, the following steps need to be taken in the years to come in a phased manner.

1. A modern and explicable visitor's centre shall be developed with the advice and involvement of the experts in the field. This should be interactive and informative not only to educate the visitors on the various aspects of nature and wildlife but also provide information on different PAs of the state and their ecology.
2. At various places along the entire stretch of the Biological Park informative boards (both in English and Hindi) displaying information pertaining to the wildlife and forestry shall be fixed which will enrich the knowledge of the visitors besides making their movement inside the Park less tiring and more interesting.
3. A gift shop for selling curios of the Park, photos, slides, guide books, stickers and other nature related artefacts, like mugs, paper weights, caps, ties, and vests etc. has been established near the main gate of the Park. This will not only help people to take back certain durable wildlife related materials back home for long time to reminisce but also carry the message further to different hands.
4. Signage is the best educative material for the visitors. They shall be properly designed, made more interesting with pictures and ecological information and put in different enclosures and in groups of enclosures. Guide maps and direction boards shall also be displayed at different points of the Park.
5. Publications like guide books, brochures, check lists, stickers, picture post cards, news letter and annual reports of high quality designed by professionals should be taken out at frequent intervals for the education and awareness of the people.

6. An arrangement may be made with the schools of the Island for visit of their students to the Biological Park. They can be exposed to various aspects of bioscience taking advantage of live animals, documents and library facility of the Park.
7. Nature awareness camps may be organized for different target groups like students from schools, colleges, professional institutions, members of women and youth organizations etc.
8. Creation of environmental consciousness through folklores, street theatre and pad-yatras.
9. An auditorium may be set up for regular film, video, slide show or lectures to the visiting student groups, zoo visitors, special interest groups etc.
10. Movie projector (16mm), large screen T.V, modern slides projector, LCD projection system and digital camera with films and documentaries on various environmental themes. The Park shall also host its own web site.
11. All plant species occurring should be labeled with their botanic, English and local names along with their characteristics and uses wherever known.
12. Biological Park shall be in touch with the Regional Natural History Museum, Regional Science Centre and eminent NGOs and organize a different nature related programme for different groups and organize quiz, sit and draw, essay competition etc.
13. A good library with latest books, journals and research papers related to nature, forestry and wildlife should be an additional attraction besides providing guidance and knowledge to the students and researchers etc related to this field.
14. An Education officer will be posted who will be involved with preparation of brochures and booklets and CDs etc, to design and upgrade the signage and train the Zoo personnel.
15. Train the staff to ensure that they are able to disseminate the information to the public visiting the zoo.

This Park has conducted many programmes in collaboration with Department of Science & technology and other institutions, Eco-clubs of various schools especially during Wildlife Week Celebration. Formal education has been given to school students, SFS trainees, IFS trainees. Range officers, and other frontline staff in the Biological Park.

2.16 <u>Activity Peculiar to the Zoo</u>:

Our Park will be unique, as it will be the only zoo in India in which the insurance population of endemic animals and plant species will be maintained. A programme of canopy walk has been initiated. A canopy walk of length 270m at a height of approx 20 m on trees will be developed inside the biological Park for which preliminary survey work has been completed. The main purpose of the canopy walk will be to study the floral and faunal biodiversity at treetops and to have an adventurous experience of walking in canopy and to have an aerial view of the flora and fauna.

A walk through aviary which will cover the entire canopy of forests will be an attraction and to maintain natural population.

The second main attraction will be Aquarium which will have live coral and its associate habitat will be established with reef fishes, holothurians, star fishes, rays and sharks and other marine life. The main mechanism to maintain the Aquarium will be plankton supply to the reef with a laboratory attached with the Aquarium.

The reptile zone will have animals like salt water crocodile, which is largest in the world, Andaman Water Monitor Lizard, which is second largest in the world, limbless reptiles will be grouped in Serpentarium & limbed reptiles will be grouped in Reptile House, and the longest snake (Reticulated Python) of the world will be another main attraction. The turtle house will have fresh water turtles. Turtle Rehabilitation Centre is for health care for marine turtles (marine section).

2.17 **Development of Post Mortem Facilities**

Systematic exposure and scientific examination of the tissues and organs of a cadaver or a dead body to determine the cause of death, the extent of lesions or the nature of illness is called post mortem examination, autopsy or necropsy**.** As per CZA guidelines, the post mortem room has been constructed separately and away from the veterinary hospital keeping in view the following critical parameters:

1. Good lighting
2. Proper Ventilation
3. Windows fitted with screens.
4. Floor and walls lined with tiles or hard surfaced material for effective washing and disinfection.
5. Proper drainage system to ensure that washings do not contaminate any open sources or fields
6. Post-mortem table and other fixtures made of steel for easy cleaning.
7. Plenty of running water.

The success of post mortem examination is based on the confirmative diagnosis which can be obtained through laboratory examination. Therefore proper collection and dispatch of samples collected from cadavers is a prerequisite for success in post mortem examination. The facility will be equipped with required equipment and storage of dead animals and samples. Linked to this facility will be an incinerator to dispose off small carcasses and other medical wastes. Safe place for burying carcasses of larger animals will also be provided. The plan for the post mortem room is shown in (Annexure -14, Page No.93) and the location of the post-mortem room is shown in Map-6, page No.85.

PART II

- Future objective including vision, mission statement/ theme and strategy.
- Future action plan
- Personnel planning
- Disaster management
- Contingency plan
- Capacity building
- E-governance
- Broad budget analysis

Chapter III

Future Objectives including Vision, Mission Statement Theme and Strategy

3.1 Future objectives:

1. Exhibit and display of wild animals in a naturalistic conditions.
2. Conservation breeding of endangered and endemic species of the fauna and restocking in the wild by maintaining insurance population.
3. Conservation education.
4. Rescue and Rehabilitation of abandoned / orphaned and deserted/ injured animals besides case properties.
5. To serve the cause of Wildlife conservation by arousing interest and concern for wildlife by organizing exhibitions and seminars among public.
6. Conservation Research: Study and documentation of the habits and behaviour of animals and birds in their natural surroundings as well as in captivity.
7. To be Member of World Association of Zoos & Aquariums and exchange animals with the approval of Chief Wildlife Warden and Central Zoo Authority.

3.2 Vision:

The Andaman and Nicobar Administration is planning to improve tourism as an industry in the islands. The tourist inflow has increased manifold. Therefore the present 40 hectares area of the park will be restricted to animal enclosures and display of fauna of Andaman and Nicobar Islands. The Park will have insurance population for species recovery of endemic species.

3.3 Mission statement:

The Biological Park, Chidiyatapu to be seen as a Centre for conservation of wildlife, to act as Wildlife welfare and management as well as data base monitoring unit for conservation by means of rehabilitation of population in wild of natural genetic resources of the Andaman and Nicobar islands.

3.4 Strategies:

1. Fostering sound techniques of husbandry that ensure physical and psychological well-being of the animals in our care, through professional animal and veterinary care and a comprehensive animal management plan with field techniques for recovery of endemic species.
2. Education, through exhibition of natural animal exhibits and various outreach programmes.
3. Conservation breeding programmes that will assist in the conservation of endemic fauna by developing field techniques.
4. Supporting and participating in scientific research that contributes towards the knowledge, understanding and conservation of endangered animals by utilizing staff, universities and other zoological institutions.

Chapter IV

FUTURE ACTION PLAN

4.1. NEW ENCLOSURES AND INFRASTRUCTURE IN THE BIOLOGICAL PARK

This section deals with proposed new enclosures, buildings and exhibits for display of animals and plants in specially created natural habitats, where visitors will also be provided specific information on each display. The layout of displays follows a general pattern of evolution of life forms in these islands, starting from the lower animals and gradually moving towards the higher groups and taxa. Showing major endemic species of various animal and plant groups from these islands will be the main objective of the Park. Recently introduced exotic species will be displayed at the end part of the exhibits, and will focus on the problems which such introductions bring to natural ecosystems, especially to the small isolated islands. Following points have been kept in view while developing the new enclosures, exhibit and buildings. The park will have suitable enclosures for species received through animal exchange programme through Central Zoo Authority.

- Topography and vegetation are considered to locate enclosures for different animal species/groups depending upon their habits and habitats and also keeping in view the evolutionary theme plan and the convenience of management.
- The enclosures shall be designed to take care of the biological needs of the animals, their safety and ease of viewing for the visitors.
- Effective population size for proper breeding and social behaviour of a species shall also be taken into account to provide adequate space for an individual or social group.
- While attempts shall be made to provide open air enclosures for most of the species with dry or wet moat barrier, other types of barrier like chain link mesh fence, glass or wall shall be used wherever felt necessary.
- All enclosures will be enriched environmentally and provided with adequate protection to the animals against climatic variation, commensurate with the individual need of the species such as boulder, caves, platform, shrubs, trees, logs etc. The enclosure will be made to merge with the natural surroundings.
- Adequate attention shall be paid for provision of animal houses to protect individuals or groups from aggressive behaviour of individuals in the group,

protection of expectant mothers, injured animals and the young ones. Such separation will help in elimination of any problem of in-fighting, cannibalism or rejection.

- Each animal house shall be provided with adequate drainage facilities and waste will be disposed off without contaminating the surroundings. There shall also be arrangements for cleaning the solid wastes and their disposal, without any risk to the animals or conservancy staff.
- Potable water supply shall be ensured to all animal enclosures and feeding cubicles.
- Natural vegetation and trees will be retained as far as possible, keeping in view the safety and aesthetic aspects into consideration.

4.2 Development of enclosures and exhibits:

The future action plan is aimed to provide direction for development of the Biological Park is aimed insurance population in the next twenty years i.e. 2017 to 2037. The proposal is based on the topography of the site, water availability, vegetation, climate, visitors, conservation, education and research needs and convenience of management. The execution of Plan is proposed to be taken up in two phases of development. During Phase-II enclosures and buildings to house mainly terrestrial species will be constructed. While in Phase-III specialized marine enclosures to display some of the main marine species, will be constructed. The guidelines of CZA and recommendations of technical and evaluation committees of CZA, which have inspected the Biological Park in December 2008 and November 2010, have also been kept in view in formulating the proposal for new structures or modification of existing structures.

For this critical developmental phase which will be having many specialized enclosures, buildings, conservatories and support facilities; consultants/firms having experience in designing and developing modern and well equipped similar facilities will be hired through a national/global tendering process, for preparing detailed project report (DPR) for Phase-II and III work which will include detailed designs, drawings and plans.

4.3 Construction of enclosures and exhibits in the Phase-II:

i). Insectarium and Butterfly House:

To showcase the rich species diversity of insects and butterflies an '**Insectarium**' and a '**Butterfly House**' are proposed for which an area of 5000 sqm of an open Insectarium opposite to barking deer enclosure and 1000 sqm open type butterfly house with a small laboratory with the facilities for breeding at least 10 species of endemic and endangered species

artificially. This has been earmarked in the South-western side of the Biological Park (Annexure - 6, Map 6, Page No.85). Amongst others Insectarium will also exhibit the Arachnids (Spiders), ants, Bugs, cicadas, dragon flies, praying mantis and the famous Centipedes to show case the rich insect diversity of these islands.

ii). Aquarium

An open enclosure of about 400 Sq.mtrs. like swimming pool type water tank with an underwater 10 meters glass tunnel for visitors to view the marine life is proposed. This Aquarium aims to showcase the rich marine biodiversity which inhabit the coral reefs and associated marine life.

iii). Reptile House and Serpentarium:

These islands have a rich reptilian diversity in the form of snakes and lizards, skinks and geckos. A '**Reptile House' and** a '**Serpentarium'** will showcase this diversity to the visitors. In such a way that all enclosures within it are having natural light and air coming into them in such a way so that enclosures are well lit and ventilated and a service area behind each enclosure for entry of the staff. A toughened glass will be in the front for viewing the exhibits while the viewing gallery itself will be in relative darkness, fully covered and properly air-conditioned and ventilated for visitor's comfort. An oval shape building with central service area, followed by enclosures arranged in a circular pattern and then the viewing gallery will be the most appropriated design, with the central roof over the service area and enclosure partially opened to allow sun light and air circulation while keeping rain away. The Reptile Houses will be located in the South Western side of the Park, simulating the evolutionary pattern of animal life on these islands (Annexure - 6, Map 6, Page No.85).

IV. **Turtles and tortoises House:**

A turtle and tortoises house will come up near to the sea and south east side of the park. This will house the fresh water turtles of Islands including Malayan box turtle and Indian flap shell turtles. The existing animals in Mini Zoo, Haddo shall be displayed in the enclosures at Biological Park.

V. Marine Turtle Rehabilitation Centre:

The Andaman and Nicobar Islands are habitat for almost all the marine turtles of the world. The advancing fishing industry in these Islands pose a big threat to the survival of the marine turtles as abundant as today. There are occasional incidents of turtle getting injured by nets and even with crocodile fights. There is a need to establish a marine turtle rehabilitation centre at Biological Park Chidiyatapu so that the injured can be treated and rehabilitated, hence it is proposed.

VI). Python enclosure: A separate enclosure need to be constructed for reticulated python to be shifted from Mini Zoo, Haddo.

vii). Nocturnal Animal House:

A separate building for the nocturnal animals shall be constructed in which some of the nocturnal animals such as swiftlet species, Andaman Palm Civet, Tree Shrews, Fruit Bat and other endemic bat species and owls etc found in these islands shall be kept for display. Provision for displaying other nocturnal animals such as Pit Vipers, Moths may also be made. This will be located in the Southern side of the Park with an area of approx. 500 sqm (Map 6, Page No.85).

viii). Enclosures for Birds:

These islands are rich in endemic birds. In order to showcase this diversity of birds, it is proposed to develop enclosures for 'Birds of prey' in the South-eastern side of Biological Park towards the sea as shown in (Map 6, Page No.85). There are eight species of eagles in A & N Islands but few important eagles will be in one zone and owls will be displayed in nocturnal animal house. The area of each enclosure will be 300 sq. m. The enclosures for Narcondam hornbill and Nicobar Megapode are located adjacent to the Birds of Prey enclosures with an area of 300 sq.m each.

The twelve enclosures for other Terrestrial birds like pigeons, doves and parakeets are located in the North-eastern side of the Biological Park with each enclosure having an area of about 80 sq. m. (Map 6, Page No.85).

A 'Walk-through Aviary' is planned where different kinds of birds like Drongos, Mynas, Andaman Tree pie, Orioles, Bulbuls, and aquatic birds like Andaman Teals, Herons, Bitterns etc will be displayed in a natural setting and visitor will be able to have a closure look at them, their habits and behaviour. This large open air enclosure spread over of min area of 12000 Sq.m will be covered in wire mesh with double door safe entry. The height of the enclosure will be about 35 meters, which will be above the canopy of the forest, so that the entire forest cover is retained in the form of natural habitat. The appropriate vegetation will be planted, and the enclosure will be landscaped with waterfalls, channels, pools and meandering pathways with specified viewing areas/platforms. This enclosure will also be located in the North-east side of the Park adjacent to the Terrestrial Bird Section or it can be shifted to adjacent to suitable site in the park. (Annexure - 6, Map 6, Page No.85).

ix). Specialized breeding facilities:

Ex-situ conservation breeding programme in respect of Water Monitor Lizard, Nicobar Pigeon, Crab Eating Macaque, Narcondam hornbill and other endemic species will be initiated in an 'off display' area inside the Park, which will be isolated and separate from the visitor area for conservation

breeding and research purpose. An area of about 900 Sqm. Located in the Northern side of the Park is earmarked for this important facility. The population of species to be maintained in enclosures. (Annexure - 6, Map- 6, Page No.85).

4.4 Construction of enclosures in Phase III:

i). Enclosures for Marine Turtles:

These islands are blessed with important sea mammal species which include Whales, Dolphins and Dugong. The Park plans to develop special enclosures in the adjoining coast just outside the present boundary of the Park in its South-Eastern side, to display the following animals,

i. Marine Turtles (Captive breeding of Hawks bill turtle)
ii. Other marine turtles to be rescued and rehabilitated after treatment

As the proposed area lies outside the present boundary of the Biological Park, but within the new proposal for increasing the park area to 405 ha., a detailed proposal with Environmental Impact Assessment under CRZ will be prepared for open water enclosures and submitted to CZA/MoEF&CC for approval (Annexure - 6, Map 6, Page No.85).

4.5 Other Infrastructure of the Zoo:

i) Development of Veterinary Hospital:

The Veterinary Hospital building has been completed with facilities for an operation theatre, a minor surgical room, clinical laboratory and dispensary room. An inpatient ward has come with six rooms for Pigs, Monkeys, Birds, Reptiles, and Deers for isolation and treatment. A permanent organizational setup for the veterinary wing of the Biological Park is proposed as indicated in (Annexure – 8, Table – 5, Page No.109).

Necessary equipment like Microscope, Centrifuge, Surgical equipment, Operation table, etc will be procured in the Phase-II of the Plan. Procurement of an ambulance and the tranquilizing equipment such as Gun, Pistol, Blowpipe and Jab stick for the veterinary hospital shall be procured with financial assistance from the CAMPA funds and other sources. The veterinary section shall have a small reference library with scientific periodicals and books on veterinary medicine. Proposal will be made for strengthening local veterinary disease diagnostic laboratory for the purpose of wildlife disease diagnosis in the UT and will be submitted to CZA for the financial assistance.

Treatment of sick animals is of primary importance in our effort for conservation of endangered animals. To prevent the spread of the contagion, a separate inpatient ward is planned to be constructed for various animal groups with proper space, drainage, ventilation and light so that the animal can feel comfortable

in the ward. Crates and squeeze cages for the animal and for the proper restraint of animals will be available in the inpatient ward. Provision for proper drainage system and foot bath to prevent the spread of infection is a must in an inpatient ward. Inpatient ward will be constructed near the hospital (Annexure - 6, Map- 6, Page No.85).

ii). Development of Isolation/Quarantine Ward

Quarantine is very important for Zoos as we know prevention is better than cure and it has become mandatory as per the Recognition of Zoo Rules, 2009 for all the Indian Zoos. A plan for this facility has been prepared (Plan Annexure-15) and it has been constructed with six rooms away from other animal enclosures in the Park for providing isolation and quarantine to the newly received animals before shifting them to relevant enclosures. Particular attention shall be paid to hygiene and sanitation in the Isolation/Quarantine Ward.

The wild animals and birds displayed in the zoos are likely to suffer from a variety of diseases, many of them akin to livestock diseases, that could be either infectious or non infectious. Their etiology may be ascribed to bacteria, viruses, parasites, fungi or Ricketssia. They may occur either singly or in combination. The crux of the issue is that once any one of them gets an entry into the zoo premises and strengthens the foot hold, it may be difficult to eradicate. At this juncture, practices and principles of disease control regimen become paramount because no amount of individual therapeutic measures for the sick would alleviate the problem. The zoo veterinarians and caretakers have to have the basic tenets of infectious diseases, encountered in the wild animals and birds, their likely source, epidemiology of the diseases in the precincts of the particular Zoo and also the neighbourhood.

Furthermore quarantine in its own way affords a chance to the animal to acclimatize to the new environment besides offsetting the ill effect of trapping, crating and transportation so that animal could regain strength to cope up with the rigors of captive life. In order that we are able to enforce the quarantine procedure effectively, one needs to have a fair working knowledge of the regulations and also about the diseases occurring in various species of wild animals to be quarantined. On completion of the quarantine period and after the animals are declared free from infection, they will be allowed to join the resident animals in display areas. The location of the quarantine is shown in Annexure - 15, Page No.94.

iii). Fodder Farm

Fodder cultivation has been taken up to provide quality grass for the herbivores. Appropriate combination of grasses and legumes shall be grown to ensure nutritious fodder supply for the entire Park. Bio-degradable wastes like leaf litter, dung and vegetable wastes shall be composted or subjected to vermiculture for producing organic manure for the fodder farm as well as other garden plants instead of using chemical fertilizers. In case of the herbivores viz. the three Deer species, the feed includes green fodder and leaves of favourable tree species. To cater to this

dietary supplement of the animals, development of a fodder farm and planting of local fodder trees are under progress. The species raised presently is Napier grass. Besides, some vegetable and fruit yielding plants such as Tapioca, Sugarcane, Banana, Papaya etc are also being raised as a supplement feed. The efforts shall be made to produce fresh feed for captive animals in house.

iv. Research Facilities:

Research and monitoring is vital for achieving various objectives of the Biological Park laid down in its vision and mandate. Owing to their geographical isolation from the Indian main land, Andaman & Nicobar Islands represents many species of fauna and flora that are unique to this area. The various conservatories proposed will help researchers for doing further studies on individual species/plant groups. Though under taking research activities directly is beyond the scope of the Biological Park, it can facilitate various research programmes on its captive fauna and flora in the following manner:

1. A 'Biologist' shall be made the overall head of Research.
2. The researcher with the help of the other Park staff should record different aspects of the wild animal behaviour, breeding, feeding, and mating behaviour, life span, habitat preference, parental papers which should be freely available to the zoo community and others.
3. The Park should collaborate with Research Institutes, Universities and Veterinary Colleges for carrying out research on animals and plants and provide facility for management-oriented research, without involving any disturbance/discomfort to animals and destroying the natural environment of the Park.
4. For facilitating research and keeping the data base, few rooms shall be set apart as a Research Centre with necessary furniture, equipment, reference books, computer etc. either in the main administrative building or in the proposed Interpretation/Visitor Centre. An onsite research facility will also be developed close to the Conservation Breeding facility as well.
5. Research can be attempted in special areas like Tree architecture, Plant-animal interaction etc.

4.6 ANIMAL COLLECTION PLAN:

4.6.1 Proposed animal collection plan:

As the National Zoo Policy, 1998 suggests, the Park will give priority to endemic and endangered species in their Collection Plan. The proposed Collection Plan is based on the evolutionary theme adopted by the Biological Park for display of local and endemic species of animals and plants. The order of preference for selection of species shall be in the descending order of locality- region- and nation.

Birds which are available at Mini Zoo, Haddo like Andaman dark serpent eagle, White-bellied sea eagle, Alexandrian parakeet, Red Breasted parakeet etc. have been shifted to the Biological Park for display. The animals for the nocturnal

animal house will include Andaman palm civet, bats, owls, rats and shrews. Initially Reticulated python, Indian flap shelled turtle; Malayan box turtle available in the Mini Zoo will be shifted to the Reptile House. Later on, endemic snakes, geckos and lizards will be brought in. Subsequently Serpentarium, Walk through aviary, Aquarium and Vivarium would be created.

Turtle Rehabilitation Centre is proposed in subsequent phase of development in order to house and provide treatment for sick and rescued marine turtles besides court case properties. Subsequently, they will be suitably rehabilitated in the wild.

The captive animals for the Zoo shall be acquired through animal exchange or gift/donation from the recognized Zoo(s) in the country. However, keeping in view the road of the Zoo to serve as an insurance cover for the threatened and endangered animal species of the Andaman & Nicobar Islands shall be housed after observation of all statutory requirements including permission under section 12 of the Wild Life Protection Act 1972.

It is pertinent to mention here that the Andaman and Nicobar Islands is very rich in faunal species. Most of the species are not available in captivity anywhere in the world. Therefore, in case of any threat to their wild population, the Biological Park shall take up the breeding of those species to supplement the in-situ conservation efforts through ex-situ measures. Further, the Biological Park shall also house in captivity some of the local species, the specimens of which may have to be collected from their wild population to maintain a buffer stock of the species in captivity in the region itself.

Any such activity shall be taken up after observation of all statutory requirements.

In case of acquisition of wild animals from the wild and/or from other recognized Zoo(s), prior approval of the CZA and other competent authorities shall be obtained. Animal species to be housed in the Biological Park are listed in the Annexure-5, Annexure-6 and Annexure-7. Plants species to be housed in the Biological Park are listed in the Annexure-10 to Annexure-17.

Andaman & Nicobar Islands exhibit very high endemism and many of these species are also highly endangered. Therefore, it is proposed to collect such species from the wild and maintain them in the Biological Park as “insurance population”. This population is used for conducting scientific studies as well as conservation breeding. The populations so generated would be released into wild as and when there is a decline of natural populations in the wild. The insurance population will be collected from wild after obtaining approval of the CWLW. These species are also proposed to be displayed for creating awareness about them to general public.

Animal Collection Plan

Sl. No.		Animals	Present Stock				Proposed Collection				Animals to be acquired/ removed				Remarks Source of acquisition
			M	F	U	T	M	F	U	T	M	F	U	T	
A		**Class: Reptilia**													
	1	**Snakes (Serpentarium)**													
	1.1	King Cobra	0	0	0	0	01	02	-	03					
	1.2	Andaman Cobra	0	0	0	0	01	02	-	03					
	1.3	Andaman Krait	0	0	0	0	01	02	-	03					
	1.4	Andaman Pit Viper	0	0	0	0	01	02	-	03					
	1.5	Andaman Banded Kukris	0	0	0	0	01	02	-	03					
	1.6	Andaman Wolf Snake	0	0	0	0	01	02	-	03					
	1.7	Reticulated python	0	0	0	0	01	02	-	03					
	1.8	Red Tailed Trinket	0	0	0	0	01	02	-	03					
	1.9	Andaman Dog Faced Water Snake	0	0	0	0	01	02	-	03					
	1.10	Andaman Rat Snake	0	0	0	0	01	02	-	03					
	1.11	Dibamus Nicobaricus	0	0	0	0	01	02	-	03					
	1.12	Andaman Cat Snake	0	0	0	0	01	02	-	03					
	2	**Lizards, Geckos & Skinks (Reptile House)**													
	2.1	Andaman Gecko	0	0	0	0	01	02	-	03					
	2.2	Red Bow Fingered Gecko	0	0	0	0	01	02	-	03					
	2.3	Nicobar bend toed Gecko	0	0	0	0	01	02	-	03					
	2.4	Nicobar tree Skink	0	0	0	0	01	02	-	03					
	2.5	Tytlers Skink	0	0	0	0	01	02	-	03					
	2.6	White Striped Skink	0	0	0	0	01	02	-	03					
	2.7	Green Forest Lizard	0	0	0	0	01	02	-	03					
	2.8	Andaman Day	0	0	0	0	01	02	-	03					
	2.9	Andaman Giant Gecko	0	0	0	0	01	02	-	03					
	2.10	Andaman Garden Lizard	0	0	0	0	01	02	-	03					
	2.11	Brook’s House Gecko	0	0	0	0	01	02	-	03					

	2.12	Andaman Rock Gecko	0	0	0	0	01	02	-	03					
	2.13	Andaman Water Monitor Lizard	1	1	6	8	0	0	0	0					
	3	**Crocodiles**													
	3.1	Salt Water Crocodile	2	6	1	9	0	0	0	0					
	4	**Turtles & Tortoises**													
	4.1	Indian flap shell turtle	0	0	0	0	0	0	0	0					To be shifted from Mini Zoo , Haddo
	4.2	Malayan box turtle	0	0	0	0	0	0	0	0					To be shifted from Mini Zoo, Haddo
B		**Class: Aves**													
	1	**Water Birds**													
	1.1	Andaman Crake	0	0	0	0	02	04	-	06					
	1.2	Andaman teal	0	0	0	0	02	04	-	06					
	1.3	Moorhen	0	0	0	0	02	04	-	06					
	1.4	Andaman white breasted water hen	0	0	0	0	02	04	-	06					
	1.5	Common teal	0	0	0	0	02	04	-	06					
	1.6	Pond Heron	0	0	0	0	02	04	-	06					
	2	**Doves & Pigeons**													
	2.1	Nicobar Pigeon	0	0	0	0	02	04	-	06					
	2.2	Andaman Green Pigeon	0	0	0	0	02	04	-	06					
	2.3	Andaman Green Imperial Pigeon	32			32	0	0	0	0					
	2.4	Andaman Emerald Dove	0	0	0	0	02	04	-	06					
	2.5	Red Collared Dove	0	0	0	0	02	04	-	06					
	2.6	Andaman Wood Pigeon	0	0	0	0	02	04	-	06					
	2.7	Andaman Cuckoo Dove	0	0	0	0	02	04	-	06					
	2.8	Red Collared Dove	0	0	0	0	02	04	-	06					
	3	**Swiftlets**													
	3.1	White Bellied Swiftlet	0	0	0	0	02	04	-	06					
	3.2	Edible Nest Swiftlet	0	0	0	0	02	04	-	06					
	4	**Parakeets & Lorikeets**													
	4.1	Andaman Red breasted parakeet	02		0	0	02	04	-	06					
	4.2	Alexandrine parakeet	02		0	0	02	04	-	06					
	4.3	Andaman Red cheeked parakeet	0	0	0	0	02	04	-	06					

	4.4	Indian hanging parrot	0	0	0	0									
	5	**Hornbills**													
	5.1	Narcondam Horn Bill	0	0	0	0	01	02	-	03					For Display
							02	02	-	04					For conservation breeding
	6	**Megapodes**													
	6.1	Nicobar megapode	0	0	0	0	02	04	-	06					For Display
							04	10	-	14					For conservation breeding
	7	**Hawks & Eagle**													
	7.1	Black baza	0	0	0	0	02	04	-	06					
	7.2	Nicobar serpent eagle	0	0	0	0	02	04	-	06					
	7.3	Changeable hawk eagle	0	0	0	0	02	04	-	06					
	7.4	Peregrin falcon	0	0	0	0	02	04	-	06					
	7.5	Andaman creasted hawk eagle	0	0	0	0	02	04	-	06					
	7.6	Andaman pale serpent eagle	0	0	0	0	02	04	-	06					
	7.7	White bellied sea eagle	01		-	01	02	04	-	06					
	7.8	Andaman dark serpent eagle	05		-	05	02	04	-	06					
	8	**Owls**													
	8.1	Andaman scops owl	0	0	0	0	02	04	-	06					
	8.2	Brown hawk owl	0	0	0	0	02	04	-	06					
	8.3	Andaman hawk owl	0	0	0	0	02	04	-	06					
	9	**Other bird species**													
	9.1	Andaman wood pecker	0	0	0	0	02	04	-	06					
	9.2	Andaman Fulvous-breasted Pied Wood Pecker	0	0	0	0	02	04	-	06					
	9.3	Andaman coucal	0	0	0	0	02	04	-	06					
	9.4	Minivet	0	0	0	0	02	04	-	06					
	9.5	Oriental magpie-robin	0	0	0	0	02	04	-	06					
	9.6	White-headed starling	0	0	0	0	02	04	-	06					
	9.7	Andaman bulbul	0	0	0	0	02	04	-	06					
	9.8	Thrush	0	0	0	0	02	04	-	06					
	9.9	Flycatchers	0	0	0	0	02	04	-	06					
	9.10	Andaman Cockoo Shrike	0	0	0	0	02	04	-	06					
	9.11	Warbler	0	0	0	0									

	9.12	Andaman Hill Myna	0	0	0	0	02	04	-	06					
	9.13	Nicobari Fowl	0	0	0	0	02	04	-	06					
	9.14	Andaman Jungle Crow	0	0	0	0	02	04	-	06					
	9.15	Andaman Shama	0	0	0	0	02	04	-	06					
	9.16	Asian Fairy Blue Bird	0	0	0	0	02	04	-	06					
	9.17	Andaman Koel	0	0	0	0	02	04	-	06					
	10	**Orioles**													
	10.1	Black Naped Oriole	0	0	0	0	02	04	-	06					
	10.2	**Drongos**													
	10.3	Andaman Racket Tailed Drongo	0	0	0	0	02	04	-	06					
	10.4	**Aquatic birds**													
	10.5	Andaman teals	0	0	0	0	02	04	-	06					
	10.6	Moor hen	0	0	0	0	02	04	-	06					
	10.7	King fishers	0	0	0	0	02	04	-	06					
	10.8	Bittern	0	0	0	0	02	04	-	06					
	10.9	Egrets	0	0	0	0	02	04	-	06					
	10.10	Andaman Treepie	0	0	0	0	02	04	-	06					
C	**1**	**Class: Mammalia**													
	1.1	Andaman Wild Pig	03	03	-	06	-	-	-						The wild pig is breeding in the park
	1.2	Nicobar Wild Pig	0	0	0	0	02	06	-	08					
	1.3	Crab Eating Macaque	04	03	-	07	02	02	-	04					For restoring the natural composition of the group for breeding
	1.4	Pig-tailed Macaque	0	0	0	0	02	04	-	06					
	1.5	Hog Deer	0	0	0	0	02	08	-	10					
	1.6	Barking Deer	01	02	-	03	02	08	-	10					
	1.7	Chital	0	0	0	0	02	04	-	06					
	1.8	Andaman palm civet	0	0	0	0	02	04	-	06					
	1.9	Andaman jungle cat	0	0	0	0	02	04	-	06					
	1.10	Nicobar Tree Shrew	0	0	0	0	02	04	-	06					
	1.11	Nicobar Spiny Shrew	0	0	0	0	02	04	-	06					
	1.12	Andaman spiny Shrew	0	0	0	0	02	04	-	06					

	1.13	Malaysian Wood Rat	0	0	0	0	02	04	-	06					
	1.14	Andaman Ground Shrew	0	0	0	0	02	04	-	06					
	2	**Bats**													
	2.1	Andaman Short nosed fruit bat	0	0	0	0	02	04	-	06					
	2.2	Lesser False Vampire Bat	0	0	0	0	02	04	-	06					
	2.3	Nicobar Long fingered bat													
	2.4	Andaman flying fox	0	0	0	0	02	04	-	06					
	2.5	Andaman Horse shoe bat	0	0	0	0	02	04	-	06					
	3	**Insects and Butterflies**													
	3.1	Butterflies	0	0	0	0	0	0	0	0					Locally available species as listed in the free ranging butterflies
	3.2	Insects	0	0	0	0	0	0	0	0					Locally available species as listed in the free ranging butterflies.
	4	**Arachnids**													
	4.1	Spiders	0	0	0	0	0	0	0	0					Free ranging Spiders
	5	**Molluscs and Crabs**													
	5.1	Giant robber crab	0	0	0	0	02	04	-	06					
D		**EXOTICS**	The Park will be a member of WAZA and functions under the control of CZA. The animals received under animal exchange programme will be exclusively maintained within the Park only.												
	1	**Class: Aves**													
	1.1	Emu	0	0	0	0	02	04	-	06					
	1.2	Ostrich	0	0	0	0	02	04	-	06					
	1.3	Blue Yellow Macaw	0	0	0	0	02	04	-	06					
	1.4	Military Macaw	0	0	0	0	02	04	-	06					
	2	**Class: Mammalia**													
	2.1	Giraffe	0	0	0	0	01	01	-	02					
	2.2	Zebra	0	0	0	0	01	02	-	03					
	2.3	Chimpanzee	0	0	0	0	01	02	-	03					
	2.4	Any other animal or plant species with the approval of the CZA.													

4.7 Justification for keeping the endangered species:

Some of the mammals, birds reptiles, etc. found in the A& N islands are endemic to the islands and their genetic diversity make them peculiar and varied in its genetic richness. It is imperative and justified therefore to conserve the endangered and endemic species of these islands, which forms the basis for keeping the endangered species as insurance population in the Park.

The Crab eating Macaque found in the Nicobar group of islands is endemic to the islands and is not found elsewhere in India/world. This is a Schedule –I animal and the general public is unaware regarding its presence. However due to its restrictive distribution, local factors and uniqueness, it becomes justified therefore to conserve this species. CZA has already selected the Biological Park, Chidiyatapu for conservation breeding of Crab eating macaque.

Other species identified by CZA for Conservation Breeding at the Biological Park are Nicobar Pigeon and Water Monitor Lizard. The Nicobar Pigeon is also endemic to these islands and is found in the Andaman and Nicobar islands. It is also a Schedule I species. They have been found in very less number mostly in remote and isolated small islands and it becomes imperative to protect and conserve them. Therefore conservation efforts through ex-situ conservation breeding will help to preserve their germplasm. The Water monitor lizard is susceptible to poaching for meat and oil. Though seen in sufficient numbers they need to be conserved as there is very little knowledge regarding their ethology, breeding and habitat.

Apart from endemic species listed in the Collection Plan, the Biological Park will be keeping other rare and unique species, some of which occur only in these islands and not necessarily in the mainland such as Pied Imperial Pigeons, Giant Robber Crabs, Reticulated Python etc will be displayed in the Park. Other rare and endangered species occurring in the islands and in the surrounding waters such as marine turtles, Dugong, Dolphin also need to be displayed for awareness and ex-situ conservation.

4.8 Conservation Breeding Plan:

The Central Zoo Authority has selected the Biological Park, Chidiyatapu for the conservation of endemic species and maintain insurance population of endemic faunal species, viz Crab eating macaque, Water Monitor Lizard and Nicobari Pigeon, keeping Chidiyatapu Biological Park as a Coordinating Zoo and the zoos at Ahmadabad and Mamallapuram as participating Zoos.

Proposal has been submitted to the CZA to include Narcondam Horn bill as a key endemic species for Conservation Breeding in the Park. This species occurs only on an extinct volcanic island of Narcondam which is isolated and small in size. The MoEF & CC has already asked for its proper conservation and ex-situ breeding to keep a captive population for any catastrophic event occurring at Narcondam Island, which may wipe out this species. Similarly, considering the rare and endemic Nicobar

Megapode, we will be making it another key species for the Conservation Breeding programme. This species is coastal breeding one and its population has been impacted by the 2004 earthquake and tsunami.

The Conservation Breeding Facility will be an off display area away from the public view and site for this has been selected in the North-Eastern corner of the Park. The Biological Park, Chidiyatapu will act as a centre for *ex-situ* conservation breeding for the following endangered species namely Crab eating macaque, Nicobar pigeon, Water monitor lizard, **Narcondam hornbill and** Nicobar Megapode etc.

The off display area for conservation breeding is shown in the Phase-II of the Biological Park. Collection of founders, their marking, and compilation of Stud Book will be taken up once the Conservation breeding Facility is constructed the Park will be able to maintain insurance population of endemic species.

Note: Crab eating macaque, Andaman Wild Pig and Andaman water monitor lizard are successfully breeding in captivity at the Biological Park, Chidiyatapu.

4.9 Research Plan:-

The Research Plan will include detailed observations of the biological aspects, behaviour, population dynamics and veterinary care of animals and a detailed data base will be developed. The data so collected shall be shared with identified institutions for detailed analysis and evolving the strategies for increasing the longevity, maintaining the genetic and behavioural viability and enhancing the reproductive potential of endangered species housed in the Park**.** The Park shall also endeavour to compile the data regarding the efficacy of the drugs and vaccines administered to the animals and share it with the National Referral Centre and other eminent institutions working in the field to get their inputs regarding more effective drugs and vaccines. The Park shall continue to endeavour for identifying the efficacious and easily implementable methods for controlling the population of prolifically breeding species such as putting implants and hormone therapy and use of other suitable methods. The Park will also keep a detailed record of the effectiveness of the animal enclosures in providing the animal's desired quality of life and the satisfaction provided to the visitors in getting unobstructed view of the animals. The observations made by visitors in this regard should also be compiled. The data so collected shall be analysed and made available to the Central zoo Authority for upgrading the designs of the enclosures. The Park will enrol fresh post graduates in the field of Wildlife Science, Veterinary science, Zoology and Botany to work in project mode on the identified areas of research by means of small grant fellowships from Central Zoo Authority. The Ministry of Environment & Forests also gives fellowships for carrying out research on wildlife namely Salim Ali Fellowship for carrying out studies on birds and Kailash Sankhala Award for carrying out studies on wild animals. The Park being a Biological Park shall take keen interest in the field of flora and carry out research activities in plant, shrubs, herbs and trees.

4.10 PLANT SECTION

In addition to the Orchidarium, already developed in the Phase I, a special Plants Section showcasing the rich and endemic plant biodiversity is proposed in the area earlier kept in Sambar Enclosure, spread over 1.5 ha. This section will house plant groups like local Gymnosperms; Canes, Bamboos and Palms; Rare and Endemic Trees and shrubs. A special Section on Flora of Nicobar, showing unique plants like Tree Ferns amongst others, will be developed. In addition to this, all the trees and shrubs etc naturally growing in the Park are being interpreted on-site with proper informative signage. Aquatic and semi-aquatic plants will be grown and displayed around water bodies dotting the Biological Park. There will be other specific areas for plants as a large chunk of the Park area is left as a natural forest growth. The Canopy Walkway will be adding more information on the life at the canopy level including a large number of epiphytes which grow over there in a tropical forest. There is littoral forest and mangrove patch just outside the Park, adjacent to the proposed Marine Display/ Section in Phase III. This area will be used to educate the visitors about specialized littoral and mangrove vegetation, which are an important part of the island's ecosystem. While introducing plants to different conservatories and nature trails, preference will be given to local and endemic and endangered species. No plant exotic to Andaman & Nicobar Islands shall be introduced in to the Biological Park and exotics will be gradually replaced with local plants and trees.

4.11 Collection Plan for Plants in Phase-II and III of Biological Park:

While introducing plants in to different conservatories and nature trails, priority will be in the descending order of - local (Chidiyatapu and neighboring areas) - island (South Andaman main island) - major island groups (Andaman and Nicobar). The plants collected will be kept in the nursery acting as an acclimatization centre for a period of 6 to 12 months according to the species adaptability to the new environment The details of plant to be displayed in the Park is at (Annexure - 15, Table – 12 & Page No.115)

4.12 Conservatory for endemic flora in Biological Park, Chidiyatapu:

Andaman and Nicobar Islands are endowed with a rich floral wealth that remained less explored till recently. Recent studies and research done on floral diversity by many experts has kindled the interest of the common people to gain knowledge about our plant life. Thus it was thought of displaying additional floral aspects in the Biological Park, which is already having a rich diversity of plants and trees naturally growing; to catch the attention of the visitors towards the myriad roles played by the plants at par with the animals in sustaining life on Earth. The present space of Sambar enclosure will be utilized for the establishment of Conservatories and Plant Houses. As the area is having naturally growing trees, it will also act as an Arboretum where tree species not naturally occurring in the Park premises will also be grown (Map 6, Page No.85).

(a). Conservatory for Endangered, Endemic & Rare plants of A & N Islands

The presence of over 2000 indigenous and 500 non-indigenous angiosperm species within a small land area of 8249 sq km is a significant feature of the Andaman and Nicobar islands, making them a cynosure not only for plant taxonomists but also for conservationists. Of the 2000 species known to occur, 14% are endemic to the islands. At the generic level endemism is rather less with only three genera viz. *Sphyranthera* (Euphorbiaceae) with 2 species, *Pubistylis* (Rubiaceae) with one species and *Nicobariodendron* (Celastraceae) with one species (Rao, 1996) (Annexure-10-17, Table-7-14, Page No.111 to 117).

(b) Herbal Garden

These Islands are the haven to a wide variety of medicinal plants. A nursery cum demonstration garden shall be created to develop to display most of the medicinal plants with their uses to acquaint the visitors with them. Besides, it will aid in carrying out research activities on these plants.

(c) Nature trails for Epiphytes

This section will be developed to show and educate the visitors about arboreal species of flora of the Park, such as epiphytic orchids, ferns and other epiphytes. Epiphytes are an important part of rain forest ecosystem. They generally grow attached to the trunks and branches of large trees and their roots offer nesting places for arboreal ants and insects. They store humus, creating home for a large and varied fauna. Individual display/name boards will be fixed indicating the local name, botanical name and family and conservation status.

(d) Fern House

Ferns are generally good indicators of richness and diversity of an ecosystem. A&N Islands have good representation of Pteridophytes. This section will house both ferns and fern allies found in these Islands. A total of 120 species of Pteridophytes has been reported from these islands that are distributed both as epiphytes and terrestrials including tree ferns.) (Annexure-27, Table-24, Page No.141).

(e) Palmetum

This section will have two conservatories, a Conservatory for climbing palms (Canes/Rattans) and a Conservatory for erect Palms. So far, 18 species of canes have been reported from A& N Islands (Renuka et al; KFRI) belonging to three genera viz *Calamus* (11 species,) *Daemenorops* (5 species) and *Korthalsia* (2 species). Second Conservatory will

house all other palms that are not covered under the above category. Thirteen species are coming under this category. (Annexure-28, Table-25, Page No.111 to 117)

(f) Bamboosetum

This Bamboosetum will house all the available indigenous bamboo species of A & N islands. As per the available literature, a total of 07 species has been described so far from these islands. The proposal is to include the bamboo species as indicated at (Annexure - 11, Table – 8 & Page No.112)**.**

(g). Conservatory for Screw pines (Pandanaceae)

Pandanaceae family includes group of plants that are important for the protection of coastal areas. Occurring gregariously along the sandy beaches and swamps, these species are of much ethno-botanical importance. The fruits of many species are stable foods of tribal people while the leaves are a good source of fibre and are generally used for making mats. This section will have 5 trees and 2 climbers belonging to the family Pandanaceae. Details are indicated at Annexure - 12, Table – 9, Page No.112.

(h). Conservatory for Aroides, Zingibers & species of Marantaceae

These are plants that mainly form the ground vegetation of tropical evergreen forests. Generally shade loving, these plants are either biennials or perennials with underground stem. An important group of plants, many of the members of this group of plants have ethno-medicinal properties. The conservatory may include species as indicated at Annexure - 29, Table – 26 & Page No.143.

(i). Conservatory for species of Piperaceae

This section will include all the species belonging to the genus *Piper*. Pepper and Beetle Leaf Wine are one of the economically important spices and also known for the medicinal values that it offers. This Conservatory will act as a Gene Bank for the wild peppers of the Islands. The species that shall be introduced to the Park are indicated at Annexure - 14, Table – 11 & Page No.114.

(J). Conservatory for Mangroves & Littoral Forest plants

Andaman & Nicobar Islands represent one of the richest assemblages of mangroves in the country. Area wise, these islands are third in the country after West Bengal and Gujarat, but as far as density, growth and species diversity are concerned, mangroves of these islands are probably the best in the country. As per the available information 17 genera with 27 tree species, 5 shrubs, 1 climber and 2 species of palms and ferns, are reported to occur in the mangrove ecosystem of these islands. Though the Protected Area network has conserved mangrove ecosystem of these islands, quite a number of species are still under the threat of extinction. Owing to the scattered distribution of these species with many of them restricted to isolated localities, a single Protected Area alone doesn't form the whole representation of all the reported species.

The proposed Conservatory will house all the available species of mangroves in the islands. The conservatory is proposed as per the guidelines of National Mangroves Conservation and Management Scheme, 2006 that has emphasized on conservation of sensitive species through *ex-situ* and *in-situ* methods and will be located near the Marine Mammals section which is having suitable inter-tidal and sheltered area for such plants. A patch of naturally growing mangrove already exists in this area (Annexure-30, Table-27, Page No.144).

(k) . Conservatory for Ornamental Plants

This conservatory is proposed for housing species of ornamental and horticulture importance. Species are listed at Annexure - 15, Table – 12 & Page No.115.

(l). Conservatory for species of Dipterocarpaceae

This section will act as a conservatory for the Dipterocarpaceae members of the Andaman group of islands, especially of genus, *Dipterocarpus* (Gurjan). The conservatory may house the species as indicated in Annexure - 16, Table – 13 & Page No.116.

(m). Bonsai section (for indigenous *Ficus* sp.)

This section is proposed for the collection of fig species available in these Islands. One of the important genera of the tropical forest plants, many of the *Ficus* species starts their life as epiphytes and partial parasites and later on turns to independent life. A group of plants whose fruits are mostly preferred by birds and bats, these plants are among the inevitable elements of moist deciduous and semi evergreen forests in tropical areas. For establishment of this section, individual plants will be raised in large pots and to be kept in green houses. Pruning of branches may be done as and when required. Details are indicated at Annexure - 17, Table – 14 & Page No.116 to 117.

4.13 Canopy Walk Way:

The Canopy Walk Way of the Biological Park will be one of its kind to be developed in the Park and will be constructed to provide insight to the myriad specialised life forms such as epiphytes etc growing at the tree canopy level and to initiate research of the flora and fauna occurring at the canopy. On the basis of the detailed design of the Canopy Walk Way, with five sections spreading over a length of 170 m at an average height of 20 m, A & N Administration has now selected an experienced firm and awarded the construction work .The Canopy Walkway will also have a small visitor centre and safety features such a CCTV for monitoring the movement of visitors on the various sections/ hanging rope bridges (Annexure-6, Map-6, & Page No.85).

4.14 Visitors' Centre for awareness and education:

The beauty and mysteries of nature cannot be unfolded at once. The previous sections deal with the live animals, the standing trees and other plants that will be apparent to the visitors during their visit. However, these displays are not sufficient to

enrich one's knowledge regarding the bounties of nature. Thus, the Visitors Centre to be constructed shape of a Nicobari hut and will be representing all the cane species of Andaman and Nicobar Islands. It will be located near the entrance gate of the Park aims to quench this curiosity of the visitors during a single visit. It shall have the modern facilities like Seminar hall/ Lecture hall, Amphitheatre and audio- visual room.

The Visitors' Centre will have an interactive natural history museum that shall display information and collections of following materials on subjects related to wild flora and fauna, environment and nature.

a) . Forest Flora:

a. Seeds and Fruits of important plants
b. Fungi
c .Other specimens
d. Photographs related to nature, wildlife and forests
c. Herbaria

b) . Forest Fauna:

Specimens, skeletons etc of Mammals, Birds, Reptiles, Amphibians, Butterflies and other Insects and Invertebrates will be displayed.

c) . Marine Fauna & Flora:

More than 1150 fish species under 507 genera of 151 families have been recorded from the seas around Andaman and Nicobar islands. These species occur in brackish water, coastal waters and offshore. Specimens of Fishes, Corals, Shells and other marine species such as Marine Algae will be displayed.

d) . Rocks, Minerals and Fossils:

Different types of rocks, minerals and fossil specimens will also be displayed in the Visitor Centre.

e). Xylarium :

The Xylarium may exhibit wood samples of important trees, canes and bamboos of the island.

f) . Education and Awareness Programme:

Education and awareness being one of the important objectives of Park management, as it plays a key role in generating empathy towards nature and wildlife among the visitors besides educating them about the different aspects of the wildlife. The whole education program is proposed to focus on different target groups through active participation of Park staff and other interested stake holders. Hence, the following steps need to be taken in the years to come in a phased manner.

1. On site Signages and Information Boards, Display and maintenance:

Signage is the best educative material for the visitors. They shall be properly designed, made more interesting with pictures and ecological information and put in different enclosures and in groups of enclosures. Guide maps and direction boards shall also be displayed at different points of the Park. At various places along the entire stretch of the Biological Park informative boards (in English and Hindi both) displaying information pertaining to the wildlife and forestry shall be fixed which will enrich the knowledge of the visitors besides making their movement inside the Park less tiring and more interesting. All plant species occurring should be labeled with their Botanical, English and Local names along with their characteristics and uses wherever known.

2. Library:

A good library with latest books, journals and research papers related to nature, forestry and wildlife should be an additional attraction besides providing guidance and knowledge to the students and researchers etc related to this field. The library will acquire, organize, maintain, utilise and disseminate informational material relevant to the ex-situ conservation and other related fields. Collection will cover topics such as zoology, animal behavior, population management, conservation, ecology, enclosure design, pathology, veterinary medicine, nutrition, botany, horticulture, zoo management, education and other related topics.

3. Nature Awareness Camps:

Nature awareness camps will be organized for different target groups like school and college students, professional institutions, members of women and youth organizations, PRIs etc. An arrangement will be made with the schools for visit of their students to the Biological Park. They will be exposed to various aspects of bioscience taking advantage of live animals, documents and library facility of the Park.

4. Film Shows and Documentary based on nature and wildlife:

An auditorium may be set up for organizing regular film, video, slide shows or lectures to the visiting student groups, normal visitors, special interest groups etc. Movie projector (16mm), large screen T.V, modern slides/LED projector will equip this facility for screening films and documentaries on various environmental themes. The Park shall also host its own web site.

5. Gift Shop:

An outlet for selling curios of the Park, photos, CDs, guide books, stickers and other nature related artefacts, like mugs, paper weights, caps, ties, and vests etc. has been established near the main gate of the Park. Once the Visitor Centre is constructed the shop will be shifted there. This will not only help people to take back certain durable wildlife related materials back home for long time to reminisce but also carry the message further to different hands.

4.15 GENERAL MAINTENANCE SECTION

The maintenance of the Park is integral for the proper management and functioning of a Park. The following sections are dealt here for this purpose.

a) Maintenance Section:

The maintenance works are presently carried in a routine. This is a short coming as separate units to deal with different types of work of the Park are not there. The administration therefore will be developing the following units for the maintenance of the Park.

1. **Workshop unit/Carpentry unit.** – For maintenance of enclosures, buildings, staff quarters etc
2. **Fabrication unit** – For development and maintenance of enclosures and all metal structures inside the Park.
3. **Water supply unit:-**To regularly monitor the supply of water to the enclosures and to ensure round the year supply of good quality water to the animals and the public.
4. **Electrical wing:** To regularly monitor the electrical lines inside the Park and offices so that the Park is well lit all the time.
5. **Landscaping and Gardening unit**: This unit will be concerned with the landscape and gardening of the Park and will also take care of the nursery and horticulture unit of the Park.
6. **Roads and drainage maintenance unit:** This unit will be concerned with maintenance of the road and drainage so that the visitor's path will be well maintained for the public.
7. **Mobile Unit:** Running and maintenance of utility and other vehicles.

b) Security section:

The security section is presently managed by the executive staff and the night watch men. The present strength is not adequate to provide proper security cover to the Park. In future with the development of more enclosures and buildings, a separate Security Section with a Security officer and complement of security guards etc. will be required. Watchtowers with low-level spotlights shall be erected at vulnerable points along the boundary wall. This can be outsourced to a private security agency as it is difficult to create regular posts.

c) Water Supply section:

The Park has a network of water pipeline to all the enclosures and the staff quarters to meet the water requirements, connected to the main tank of 50000 litre capacity. In addition to this three RCC weir/ check dams have been constructed in the vicinity of the Park to meet the extra requirement of water for the Park. Although the rainfall is high and spread over 170 days of the year, fresh water supply is comparatively scarce and acute shortage of water is faced in this area during the summer season from February onwards till the onset of South West Monsoon in mid May. The ground water

sources of the entire area have already been surveyed and bore wells shall be made to supplement the water supply and as a back up system to meet emergencies. In addition to these, a series of check weirs along the streams occurring inside the Biological Park are made. Besides, the existing ponds have been deepened and de-silted to enhance their water holding capacity. Rain water harvesting structures are being constructed with all new buildings for augmenting the water supply.

4.16. Disposal of Solid and liquid wastes and sewerage:

A separate Solid and liquid waste disposal section will be developed for disposal of solid and liquid waste. A centralized system where in all solid wastes of the Park will be collected at suitable points and then disposed of outside the Park at Prothrapur selected for the purpose by the Administration from where plastic,glass and other non degradable materials will be shipped to mainland for recycling. The liquid wastes will also be either treated or drained off outside the Park through proper drainage system. Sanitation is the most important aspect of the Park. A separate sanitation wing with separate sanitary workers and vehicles and other accessories like dustbins, wheel barrows, etc be in place so that all solid wastes are disposed in proper manner. Use of polythene and tetra pack are discouraged and completely prohibited inside the Park. Composting of biodegradable wastes are being done in the composts pits through vermiculture method. The soil of the garden and lawn will be enriched by mixing it with compost, thereby adopting organic farming. There is absolutely no use of chemicals and fertilizers in side the park.. The manure so generated shall be used in the fodder farm, lawns and gardens.

4.17. Horticulture and Landscape section:

A separate landscape section will be developed which will carry out proper landscaping of the Park and areas around the enclosure and maintain the nurseries and plant sections.

4.18. Store and Feed supply Section.

The Park has a large store godown and the feed preparation room is functional now. Depending upon the future needs, this Section will be further developed.

4.19 SPECIAL ACTIVITIES AND PLANS

a) Rescue Centre:

A. Land Animals and Birds

Necessary off-display facility as required for Rescue Centre will be developed in the Biological Park, Chidiyatapu. Further in future, the animals rescued from the wild are rehabilitated in the wild or retained in the Park.

In Andaman and Nicobar Islands, the wild animals which interfere with humans are Snakes, Water monitor lizards, Salt water crocodiles, Wild pigs, Deers, Monkeys, Elephants, Sea turtles, Civet cats, Bats and Birds. Those interfere with humans are caught, treated and released in wild. The Inpatient ward of the Veterinary Hospital is being developed to cater the needs.

B. Marine Animals

The Marine Section of the Rescue and Rehabilitation Centre for Marine turtles and mammals will come up to cater the animals trapped and injured in the fishing nets or by mechanized boats etc.

C. Exchange of Animal through WAZA and CZA.

The Biological Park will take part in exchange of surplus zoo animals under exchange programme through CZA guidelines. The animals received through exchange mostly may be exotics, but preference to be given for endemic or migratory species.

Chapter V

PERSONNEL PLANNING

a) Proposed Staffing pattern

The additional manpower will be put in place by transferring existing posts from the divisions where they are surplus or new posts will be created in future, as per the need and technical requirement. Details are indicated at Annexure – 21, Table -18 & Page No.119-121 .

b) Proposed Mechanical and electrical Pattern

The Park will be equipped with modern machineries, equipments, plants, tools and other essential instruments for the management of the Park. The electrical power installation network and solar power equipments will also be made available as and where necessary without disturbing the natural environment.

Chapter VI

Disaster Management

6.1 Disaster Management:

Disaster management is an important and integral part of any organization. Andaman & Nicobar Islands are located in the Seismic zone -'V' and are therefore, vulnerable to frequent and sometime strong earth quakes. The islands are also located in the subtropical region in the Bay of Bengal and because of this critical location are susceptible to Tropical storms and cyclones which often pass over the islands during the advent of South-west and North-east monsoon every year and sometime causing serious damages to the vegetation and other facilities/services. In view of the above, the Biological Park needs to have a well developed plan for disaster management.

Following are the main objectives of the disaster management plan of the Park:

1. To ensure emergency preparedness among all the sections of staff and workers against a disaster event.
2. To devise mitigation measures for protection of enclosures and facilities from adverse effects and of disaster events.

Many of the disasters which are faced by these islands occur without any warning. In such a situation, very little precautionary measures can be taken to save lives and properties within a short span of time. However, with an effective Disaster Management Plan, the preventive measures can be taken to reduce the impact of disaster and quick response towards rescue and rehabilitation in the post disaster phase.

On the basis of their origin, the disasters can be divided as under:

1. Meteorological disasters: These include - Cyclones, Floods, and Droughts etc.
2. Topographical disasters: These include - Land slides
3. Tectonic disasters: Tectonic disasters includes - earth quakes and tsunami.
4. Infestic disasters: This includes – Epidemics, infestation of Parasites etc.

The present approach to disaster management is termed as proactive rather than only reactive as was done in the past. This includes the measures of –

a. Preparedness
b. Mitigation
c. Prevention

6.2. Emergency Preparedness:

An adequate and proactive approach is being adopted for prevention and mitigation of the disaster in accordance to the state Disaster management Department, Andman and Nicobar Islands, awareness regarding planning and preparedness will ensure people prepared to meet any eventuality. Preparedness involves the elements that people are ready to help the community during a disaster. This comprehensive programme is termed as the holistic approach including prevention, preparedness and mitigation.

The Park staffs are being trained for Collapsed Structure Search Rescue (CSSR) and Medical First Response (MFR) by the Nodal Officer, Disaster Management unit for the Andaman and Nicoobar islands. A GPS and strong motion network and emergency communication system is being setup at the Biological Park, Chidiyatapu for emergency operations. A disaster management card for Biological Park, Chidiyatapu has been placed (Annexure No.9). Time to time mockdrill exercise are conducted regularly for the benefits which include medical help (with medicine and Attendant), Transportation, accommodation (standby Electricity Generators), food arrangenment, communication (VHF, Intercom. LAN network, Telephone & Mobile connectivity). Life support system & Rescue system being established for all the inmates of the Biological Park. A well laid plan of operation/ Standard Operative Plan (SOPs), drill etc. are being put in place.

Further, to combat any hazards, the Biological Park has two important units as one development and management section and seconds the animal section with adequate trained staffs and equipments in place. The park is on "Emergency Preparedness" under the Andaman & Nicobar Administration. The teams will be trained with advanced skills to mitigate disaster. A "Disaster Management Team/ Quick Response Team" for each of the animal holding facilities as well as visitor's amenities will be constituted for the Biological Park with a handbook that will specify –

- Chain of Command in the Team.
- Members of a team.
- The Plan will have clear written instructions for all the team members.
- Each team member should know exactly his/her role during the time of disaster.
- Other items of personnel needs as well as of animal needs are kept in stock (for one month) including equipment and emergency tools. Personnel needs like - Water, Food, First Aid, Boat, Life Jacket, Lantern, Battery, Torches, Rain/Cloths and Stoves, good communication facilities including Radio have been made available. Animal needs like - Generators, chainsaws, Plastic sheets, Nets, Nylon strapping, Ropes, Sandbags, Capture equipment, Tranquilizing drugs and veterinary supplies, Plastic/ galvanized chain link fencing material, winch equipment, stocked fresh feeds and dry feeds for one month are kept reserved to meet any eventuality.
- The park is located is in an isolated place and far from Port Blair, a close link is being established with the district and State Disaster Management Department. The Andaman and Nicobar Administration has planned to establish a seismic observatory in the forest residential colony of the Biological Park with Sattelite phone and other disaster relief and rescue materials for better co-ordination as part of the state disaster management plan. Two rooms of the primary school at Chidiyatapu have been identified and the disaster relief materials are in stock.

6.3 Vulnerability mitigation:

In simple terms vulnerability refers to the susceptibility of a person, group, society or system to physical or emotional injury or attack by any disaster. In relation to hazards and disasters, vulnerability is a concept that links the relationship that people have with

their environment to social forces and institutions and the cultural values that sustain and contest them. The Park by maintaining insurance population will be an institution to conserve wildlife with the capacity to reintroduce the effected species.

6.4 Prevention measures:

Prevention and mitigation measures are necessary to reduce the risk of potential disasters. The PRRP (Preparedness, Response, Recovery, and prevention) approach forms a new strategy to combat the natural and manmade disasters. As a preventive measure, the new constructions and renovations of zoo facilities should be sturdy enough to withstand the effect of earthquake and storm surges. The infestic disasters will be tackled by adopting preventive measures like maintaining hygiene, screening the infected animals, monitoring the health of the housed animal on regular basis, keeping the newly acquired animals under quarantine for considerable time etc.

Chapter VII

CONTINGENCY PLAN

7.1 Animals rescued from the wild:

The union territory of Andaman and Nicobar Islands is having over 80% forest cover and rich coastal habitats. As a result there are instances of animals straying into human habitations and also animals caught from the poachers, which need to be rescued, treated and rehabilitated in the wild. A senior veterinary officer has been appointed to attend this issue. The following equipments are a must for the rescue of animals in case of emergency.

A. Cages and Traps
B. Vehicles
C. Tranquilizing equipment and chemicals

Tranquilizing equipment is a must in capturing wild animals' tranquilizing zoo animals for medical care and treatment etc. without putting the wild animal in stress or trauma for various reasons like rehabilitation, treatment etc. Therefore the Park must maintain the minimum tranquilizing equipments in good condition with spare equipment for tranquilizing the wild animals. At present the tranquilizing zoo animals for medical care and treatment is being taken care by the SVO.

Drugs:

The drugs required to meet any emergency situation inside or outside the Park is indicted at Annexure – 18 & 19, Table – 15 & 16 & Page No.118-119**.**

A rescue team with the Range Officer, Animal Section to lead the team and direct the members during such sensitive operation should be in place so that rescue of animals can be done in an effective manner. The team members will be HVC, one forester, two animal attendees and required number of *mazdoors*.

7.2 Escape of animals from enclosures and their handling:

1. Escape:

Escapes of the zoo animals can create unforeseen situations. Meticulous prior planning with adequate finance is needed for preparedness to face such exigencies in the interest of zoo animals as well as public safety.

The procedure to be adopted in the event of escape of an animal from its enclosure should be prepared in advance by the Park management to meet such an eventuality.

- ❖ An alarm system has to be in place to alert the security and to evacuate or cordon off visitors from the scene of incident. The Biological Park, Chidiyatapu has been brought under the coverage of mobile network. There is VHF network service at the office and field staff will be provided with handsets for communication and guidance.
- ❖ The contingency plan should be brought to the attention of and made available to all members of staff in a written document. Most of the inmates are in close contact with staff and animal attendees. They are being handled for health care with utmost precautions. While the specific impact of each form of disaster may vary, a common framework or contingency plan structure should be organized on the following lines:
- ❖ The reporting of every escape by the quickest possible means should be made to the most senior member of the staff readily available on the site.
- ❖ Assignment of different tasks to be carried out by members of the staff in the event of an escape, recapture of the animal, visitor control, liaison with other departments, security of the Park perimeter including all points of entry and exit etc need to be specified.
- ❖ Provision of equipment such as fire arms, tranquilizing equipments, nets, transport cages, medical care and treatment if necessary after recapture of the animal should be worked out and discussed with police, fire dept. etc.
- ❖ Provision of a vehicle to carry the equipment and staff to avoid delay in capture of the animal. More than one Park personnel should be trained in the use of fire arms/tranquilizing equipment.
- ❖ Every effort should be made to restrict the escaped animal within the Park premises.
- ❖ Written account of each escape incident should be maintained for future reference. Each case of escape must be thoroughly investigated and appropriate action should be taken whether it is rectifying a defect in design/operation of an enclosure or lapses on part of the staff as the case may be.
- ❖ In case of animals attacking the visitors the animals need to be shot with the permission of Chief Wild life warden, for this purpose 0.303 Rifle ammunition should be kept ready.
- ❖ Communication system should be effective in communicating the incident through VHF or any other System.

2. Recapture:

a) The first veterinarian/curator/collection manager to be notified will report of the escape site and will be met there by the security guard or staff with a VHF. The security guard will establish a communication center at the site.
b) The veterinarian/senior curator will direct the recapture effort. Others can make suggestions but no one should argue with him.
c) Security guard will be responsible for the crowd control and destruction of the animal if necessary.
d) The recapture strategy may involve chemical immobilization, nesting , trapping or simply encouraging the animal to return to the animal enclosure
e) Patience, planning and cooperation are the ingredients of successful capture.

f) If dangerous animal escape from the perimeter of the wall then outside help should be taken.

7.3 Monkey and Dog menace or other menace: There is no monkey and dog menace in the park. The free ranging Raptors, Civets, monitor lizards and snakes like king cobra, vipers etc. The park to take adequate preventive measures.

7.4 <u>Arrangement of food in cases of strike/non supply by contractors</u>:

The occurrence of strikes is a common problem seen in the zoos and is a management problem which has to be addressed so that a constant supply of feed materials is made available in cases of strikes and non supply of feed by the contractors. The following steps will be undertaken in the Park.

- The non perishable feeds like Groundnut cake, wheat bran, grams etc can be stored for longer duration. But the perishable feeds like tapioca, fruits, chicken, fish, vegetable etc, storage is a problem. Thus a deep freezer facility is required to store such items for a longer period. Additional arrangement can be made at Zoo premises for producing perishable items with the help of staff and workers

- Provisions should be made to secure minimum animal care services though hired labour, volunteers, sister organizations, animal welfare groups, community service groups etc.
- If provisions are made to seek voluntary help in the event of a strike, the group should be pre-trained; preference list of work area should be prepared along with the names, addresses and residence, phone numbers of volunteer group members. Assignments and backup help should be identified for each individual volunteer.
- Adequate arrangements for uninterrupted supply of essential diet and other items during strike period should be made in advance.

- Non-perishable food items or substitutes required for at least a week should be maintained in store as reserve.

7.5 <u>Snake bite</u>:

Biological Park, Chidiyatapu is established inside the Bimblitan Reserve forest. The evergreen, as well as deciduous forest is infested with snakes like king cobra and other poisonous as well as non poisonous snakes. And there are chances of animal keepers or even a visitor getting a snake bite. To prevent any causalities on account of snake bites,

Anti venom serum stock has to be stored in the hospital for such an eventuality. Also, King cobra anti venom should be procured. First aid kit should be kept at all important points in the Park and should be maintained regularly.

Inclusion of venomous snakes in the Park collection presents several unique problems for the management staff. Snake bite is a hazard in a facility keeping venomous snakes. The work area should be escape proof so that a snake that is removed from the cage is still adequately confined. A reasonably large work area, free of obstructions should be provided so that the snake handler can manipulate and control the snake while handling maintaining a safe distance from it. As a facility the wider roads without any vegetation have been developed and coloured & tiled footpath for clear visibility have been created in visitor's accessible areas to avoid any encounter with snakes. A guide with the battery operated vehicles move inside the Park for help in case of a bite other than the mobile network connectivity and people movement in groups and through the battery operated vehicles. Reasonable medical attendant room with facilities have been made available in the entrance gate.

Appropriate anti-venom for the animals displayed will be kept under refrigeration. An anti venom inventory will also be kept of the type to be used for each snake, clearly indicating on the containers and near each snake cage. The park staff will be trained to handle snakes and they will be members of rescue and relief team for snakes and reptiles for the Islands. A co-ordination team consisting of park staff and a team of doctors and professors from the Andaman Medical College will be made to handle with snake bites. We will also keep the address of a physician who will agree to be on call to handle cases from the Park and initiate a program for handling and use of anti venom. Regular training programmes for visitors and PRI members will be conducted at the park premises for handling of snakes and reptiles. Major precautions are necessary for security and proper handling of reptiles and for quick and effective treatment of personnel in case of snake bite.

7.6 Visitors getting injured / falling inside enclosures :

In order to attend an injured visitor, first aid kits have been provided at important points (Entrance gate, Feed Preparation Room, Office Premises, Veterinary Hospital, Forest Rest House and Cafeteria) of Park. To rescue the visitors falling in to the

enclosures especially wet moats, collapsible/ portable ladders of suitable lengths have been kept. To prevent visitor from falling into moats, the railing and live hedges set up around each moat has been strengthened. There are chances of adults getting fainted and therefore arrangements for stretchers are made available in the Park. Proper facilities are required for shifting like battery operated vehicle have been placed for visitor movement in the park and the patient immediately can be shifted to the nearest hospital. Security staffs and animal attendants shall be always there to keep a close eye on the movement of the visitors to avoid any unwary incident especially near enclosures displaying dangerous animals.

7.7. <u>In fighting among animals</u>:

Ungulates which exhibit seasonal breeding and a rutting season have a strong drive to challenge and fight rivals especially when there is female in estrus. A proper sex ratio of males to a group of females should be kept, to prevent infighting in the animals due to competition. Therefore proper population management is a must in preventing the outbreak of fighting among animals. Population management includes demographic management, genetic management, veterinary care and husbandry.

Demographic management is concerned with monitoring the age, social structure of the population and number of con-specifics to ensure reliable reproduction as well as the determining the need to breed a desired growth rate. The problems faced are managing population, growth rates and limited resources. As population grows the following activities are to be taken up

1. Animal need to be sent to other Zoos
2. Reproduction should be limited by isolation of males, controlled breeding, sterilization operations like vasectomy etc
3. Use of contraceptives by applying veterinary care and management.
4. Euthanasia wherever needed
5. Reintroduction of animals into the wild or animals in excess numbers to the wild.

7.8. Epidemics:

An epidemic is an occurrence of disease in excess of its anticipated frequency in an area. Epidemics can cause large scale mortality and thereby wipe out the entire population of an area. Therefore it becomes necessary that all necessary precautions are taken to prevent the occurrence of an epidemic in a Zoo. A contingency plan to prevent the occurrence and spread and to control an outbreak of diseases is a must in a Zoo. Knowledge of the etiology of diseases, previous history of outbreak, the area of occurrence are important to prevent the occurrence of diseases in a Zoo. Following factors are important to prevent the spread of diseases in a Zoo.

1. Stock selection and Animal history :
2. Quarantine
3. Vaccination
4. Tuberculosis Testing
5. Parasite Control
6. Post Mortem Examination and proper carcass disposal
7. Pest Control
8. Sanitation
9. Health programme for personnel

7.9. Turtles Rescue and Rehabilitation Centre

The Andaman and Nicobar islands has a long sea coasts and throughout the islands turtle nesting is a prime natural phenomenon occurring every year. The recent advancement in the intensified fishing industrial activities has come up as a threat to the nesting turtle. A turtle rescue and rehabilitation centre in the marine section of the Biological Park with a veterinary hospital will help the treatment of the injured turtles.

7.10. First Aid and Nursing Room for medical emergency

The First aid and nursing room facilities have been developed at the main entrance gate with all necessary medicines, wheelchair and stretcher etc. The first aid facilities also been placed at FRH, and with Section officers for immediate availability of drugs and immediate health care.

7.11. Fire Control and Safety

1. **Layout Plan:** A fire control plan is in place with the consultation of Chief Fire Officer of the Andaman and Nicobar Administration. The fighting equipment as per the suggestions have been procured and placed in position as preparedness to fire fighting. Staff and workers also are trained in this aspect by the fire service personnel from time to time.

2. **Fire fighting equipments and training:** The Andaman and Nicobar Administration has arranged the fire service department to look into the requirement of the Park. As per the guidance of the fire service regular inspections the preparedness to mitigate the fire hazards. This will be regularly be maintained to the standards of the Administration.

7.12. Break down of feed supply:

The park authorities have been instructed to keep the stock for one month always of the stockable items. Perishable article to be regularly procured .The deep freezer and cold store facilities have been developed.

Chapter VIII

CAPACITY BUILDING

PLAN TO UPGRADE SKILLS OF ZOO STAFF, INTERACTION WITH OTHER ZOOS; REGIONAL COOPERATION WITH INSTITUTION

8.1 CAPACITY BUILDING AND HUMAN RESOURCE DEVELOPMENT:

Capacity building of staff is a major tool for the successful running of Park. This requires good infrastructure, trained manpower. Holding workshops on various conservations themes and management aspects of modern Zoo and Botanical gardens will help the staffs to equip with the changing trends in the conservation and management of both flora & fauna of the Biological Park. Training for staff on various interpretation themes and modes are also to be taken up. Local animal keepers and subordinate staffs can be given basic training in the Zoo itself by the competent and senior staffs. Junior staffs can be attached with the senior and experienced staff, so that they can learn the skills of the job. Supervisory staff can be deputed to different training institutes for short term training which will enhance their knowledge and skills and make them aware of the latest development in wildlife and Zoo management. Presently animal keepers are sent to various mainland zoos and facilities for training. Interaction with other Zoos is to be increased and cooperation at regional levels will be strengthened. Specialized training will be imparted to the staff by sending them to institutes like WII, IVRI, etc.

The existing trained personnel of the Park include six workers who are trained in management of wild animals in the Zoo from Nadankannan Zoological Park (Bhubaneswar) and Arignar Anna Zoological Park (Chennai); 4 workers are trained in capturing and management of crocodiles from the Centre for Herpetology, Madras Crocodile Bank Trust, Mahabilapuram. Two designated animal keepers have been trained in Arignar Anna Zoological Park. In addition to this, the Park has trained three executive staff in the rank of Forester and Forest Guard in management of wild animals from Arignar Anna Zoological Park, Chennai and from Sanjay Gandhi Biological Park, Patna. One staff has been trained in handling of ARKS software for maintenance of the data for wild animals in the Park. The Range Forest Officers have also been trained in wildlife management having done their certificate course from the Wildlife Institute of India (WII), Dehradun. The present Deputy Director has also done the PG Diploma Course in Wildlife Management from the WII, Dehradun.

Chapter IX

DATA BASE AND E-GOVERNANCE

9.1 Computerization and Information System

A comprehensive information system for database management covering all aspects of the Biological Park and suitable training of the Park staffs need to be developed. The PARK MIS (Management Information System) and computerization with appropriate hardware and software for all the sections and administration of the Biological Park is felt necessary. The management of data for animals is also being developed by means of software and hence a separate computer and information system is a must for proper functioning of the Park. The Park has been successful in implementing the ARKS software which is an excellent tool giving the entire history of the animals including the Identification number, weight, length, girth, sire and dam records, number of animal species in the Park , number of each species of animals, number of enclosures etc. The Park has separate computer for ARKS software and data of all the animal species has been included in the database. Trained personnel is handling the database. Development of website and putting up the Park data base online will be taken up.

The park is being registered with WAZA under the guidance of CZA. This will enable the maintenance of stud books for most of the endemic fauna.

Chapter X - BUDGET ANALYSIS

10.1 Broad budget Analysis for implementation of Plan

The Biological Park has started with an estimated project cost of Rs. 11.00 crores as shown in the project proposal included in the IX Five Year Plan. The actual activities towards the project started in 1997-98. Because of administrative reasons the project could not be completed in the said five year plan, as such it was continued through X five year plan & finally in the XI five year plan as well. Though it is still under the developmental phase; much progress has been achieved so far. The construction works and other developments that have already taken place and also those that are under progress have been detailed in Table 1.

The Biological Park is proposed to be fully operational by 2037.

10.2 Construction and Development:

A) The park is in the construction and development stage and requires huge funds for completing the planned works.

S .No.	Particulars	Area	Amount Rs. in lakhs
1	**Nicobar megapod Enclosure**	300 Sq.m	30.00
2	**Narcondam hornbill display enclosure**	300 Sq.m	48.00
3	**Narcondam hornbill breeding enclosure**	600 Sq mtrs	65.00
4	**Andaman Caucal enclosure**	80 Sq.m	20.00
5	**Andaman wood pecker enclosure**	80 Sq.m	20.00
6	**Andaman tree pie enclosure**	80 Sq.m	20.00
7	**Andaman teal and water hen and moorhen enclosure**	80 Sq.m	20.00
8	**Pigeons enclosure**	80 Sq.m	20.00
9	**Andaman crake**	80 Sq.m	20.00
10	**Andaman Wood Pigeon (Columba palumbodies)**	80 Sq.m	20.00
12	**Enclosure for Rapters (**Andaman Baza) etc.	300 Sq.m	35.00
13	**Reptile House**	40 Sq mts each 10 nos	15.00 each
	a.Andaman Gecho		
	b.Red Bow Fingered Gecko		
	c.Nicobar bend toed Gecko		
	d.Nicobar tree Skink		
	e.Tytlers Skink		

	f.White striped Skink		
	g.Green Forest Lizard		
	h.Andaman Day		
	i.Green forest lizard		
14	**Serpentarium** a.King Cobra	80 Sq mtrs	22.00
	b.Dibamus nicobaricus	40 sq mtrs each	15.00
	c.Andaman cobra		15.00
	d.Andaman krait		15.00
	e.Andaman pit viper		15.00
	f.Andaman banded kukri		15.00
	g.Wolf snake		15.00
	h.Red tailed trinket		15.00
	i.Nicobar sand boa		15.00
	j.Andaman cat snake		15.00
15	**Nocturnal Animal House** **a.Mammals** 1.Andaman Palm Civet	80 sq mtr	18.00
	2.Nicobar tree Shrew	40 sq mtrs each	12.00
	3.Nicobar Spiny Shrew		12.00
	4 .Andaman Spiny Shrew		12.00
	5.Malaysian Wood Rat		12.00
	6.Jungle Cat	80 sq mtrs	15.00
	b. bats (Three spps) **1** Andaman short nosed fruit bat **2** Lesser false vampire **3** Nicobar long fingered bat	Natural open house	22.00
	c. Birds.		25.00
	c1.Owls (Three Spps)	40 Sq Mtrs	8.00 each
	c2.Swiftlets(two Spp**)**	Natural open house	35.00
16	**Enclosure for Reticulated python**	300 Sq Mtrs	20.00
17	**Aquarium**	440 sq mtrs	45.00
18	**Walk through Aviary**	12000 Sq Mtrs	225.00
19	**Turtle Rescue and Rehabilitation enclosure**	2.00 Ha	35.00
20.	**Visitors centre**	600 sqms	40.00

S .No.	Particulars for development of Plant Sectiion	Area	Amount Rs. in lakhs
1.	**Identification of Trees and plants**	40 ha	5.00
2.	**Development of Plant Section with 480 mtrs footpath and information center**	2.00 Ha	5.00
3.	**Development of Bamboosetum**	0.20 Hac	2.00
4.	**Conservatory for endemic flora**	0.20 Hac	2.00
5.	**Conservatory for screw pines**	0.20 Hac	2.00
6.	**Conservatory for aroides, zingibers and morentacea**	0.20 Hac	2.00
7.	**Conservatory for piperacea**	0.20 Hac	2.00
8.	**Conservatory for mangroves and littoral forests**	0.20 Hac	2.00
9.	**Conservatory for ornamental plants**	0.20 Hac	2.00
10.	**Conservatory for Dipterocarpus**	0.20 Hac	2.00
11.	Development of bonsai section	0.20 Hac	2.00
12.	Development of Fern house	0.20 Hac	2..00
13.	Development of palmetum	0.20 Hac	2.00
14.	Nature trail for Epiphytes	480 mtrs	2.00

10.3 Day to Day Maintenance:

S No	Particulars	Amount Lakhs/day	Monthly In Lakhs
1	**Daily procurement of Feed article**	**0.65**	**2.00**
2	**Veterinary Section**	**0.02**	**0.60**
3	**Sanitary Section**	**0.01**	**0.30**
4	**Water Supply**	**0.05**	**1.50**
5	**Watch and Ward**	**0.10**	**3.00**
6	**Protection**	**0.10**	**3.00**
7	**Tourist Guide**	**0.05**	**1.50**
8	**Entrance Gate**	**0.05**	**1.50**
9	**Maintenance of road**	**0.05**	**1.50**

PART-III(A)

Management Plan

Chapter XI

MANAGEMENT PLAN

11.1 <u>Budget</u>:

YEAR	FINANCIAL ASSISTANCE UT PLAN AND OTHER SOURCES	Major activities to be taken up
2016-2017	1,50,00,000	
2017-2018	1,60,00,000	
2018-2019	1,70,00,000	
2019-2020	1,80,00,000	
2020-2021	1,90,00,000	
2021-2022	1,50,00,000	
2022-2023	1,60,00,000	
2023-2024	1,50,00,000	
2024-2025	1,50,00,000	
2025-2026	1,50,00,000	
2026-2027	1,50,00,000	
2027-2028	1,50,00,000	
2028-2029	1,50,00,000	
2029-2030	1,50,00,000	
2030-2031	1,50,00,000	
2031-2032	1,50,00,000	
2032-2033	1,50,00,000	
2033-2034	1,50,00,000	
2034-2035	1,50,00,000	
2035-2036	1,50,00,000	
2036-2037	1,50,00,000	

CONCLUSION

Since the Biological Park will undergo a complete modernization within the period of this Master Plan, it is necessary to give special attention to the following aspects of execution:

1. As far as possible, emphasis shall be given for providing large space to each exhibit, provide dry, wet, or concealed moats as per the need of the species.
2. Excessive exposure of the concrete structure should be avoided and effort should be made to give special effects to barriers and night shelters and cubicles by merging them with the surrounding or to give a look of the animal habitat.
3. Wherever possible natural effect should be conserved and nurtured.
4. Use of laterite blocks or sand stone etc. should be preferred to concrete.
5. The enclosures should not be designed in isolation. All aspects of the surrounding area including other enclosures, topography and vegetation should be taken into consideration for design and layout of the new enclosure. For this purpose it will be better to use the services of landscaping architect.
6. All structures should be painted with selected colours that should merge with the nature instead of using very bright or garish colours.
7. No tall structure above the tree height should be erected within the Park, as that will spoil the landscape of the Park.
8. Build up area should be in no case more than 10% of the area use or the Biological Park.
9. Special attention has to be given for plantation of indigenous evergreen or semi evergreen vegetation. Emphasis should also be given to plantation along the roads and in the enclosures with due planning.
10. All Guidelines, Rules and Directions of the Central Zoo Authority and other statutory bodies should also be kept in view while planning new developments so that they are not violated.
11. Education and interpretation should be given top priority in any future development of the zoo.
12. The Biological Park, Chidiyatapu will be a member of World Association of Zoos and Aquariums and will become one of the best Centre for animal welfare, Research, Education and interpretation, Conservation and Recreation.

Within the detailed prescriptions made herein and taking into account the problems which are naturally faced from time to time, an annual action plan may be prepared to ensure timely supply of feed and water, to take care of animal health, security as well as personnel policy.

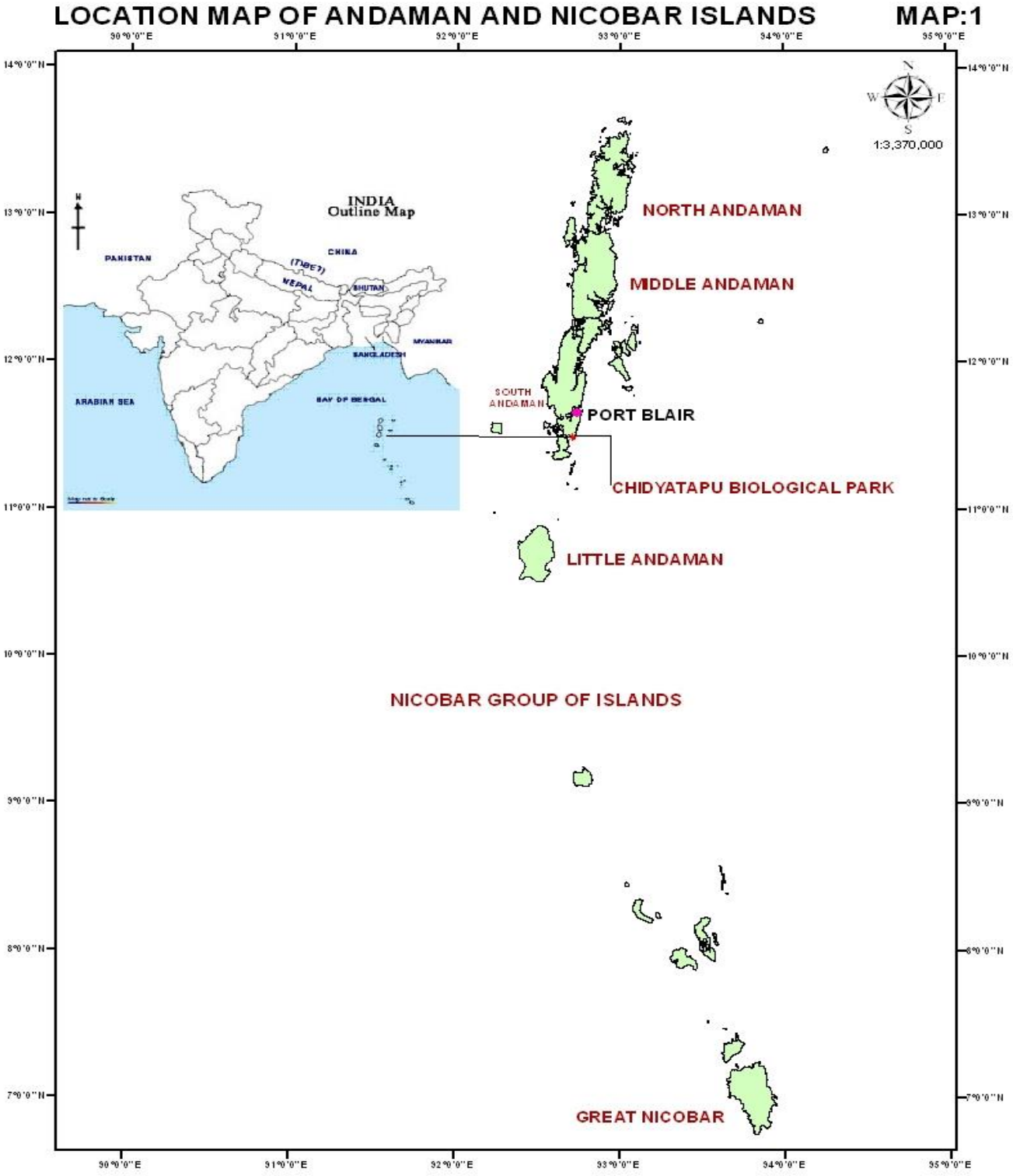
This Master Plan is prepared for a period of twenty years with a provision for revision after ten years. As a number of developments are taking place in design of enclosures, animal husbandry and display of exhibits, the plan need to be reviewed at the end of ten years to bring in modification needed if any, for the succeeding ten years.

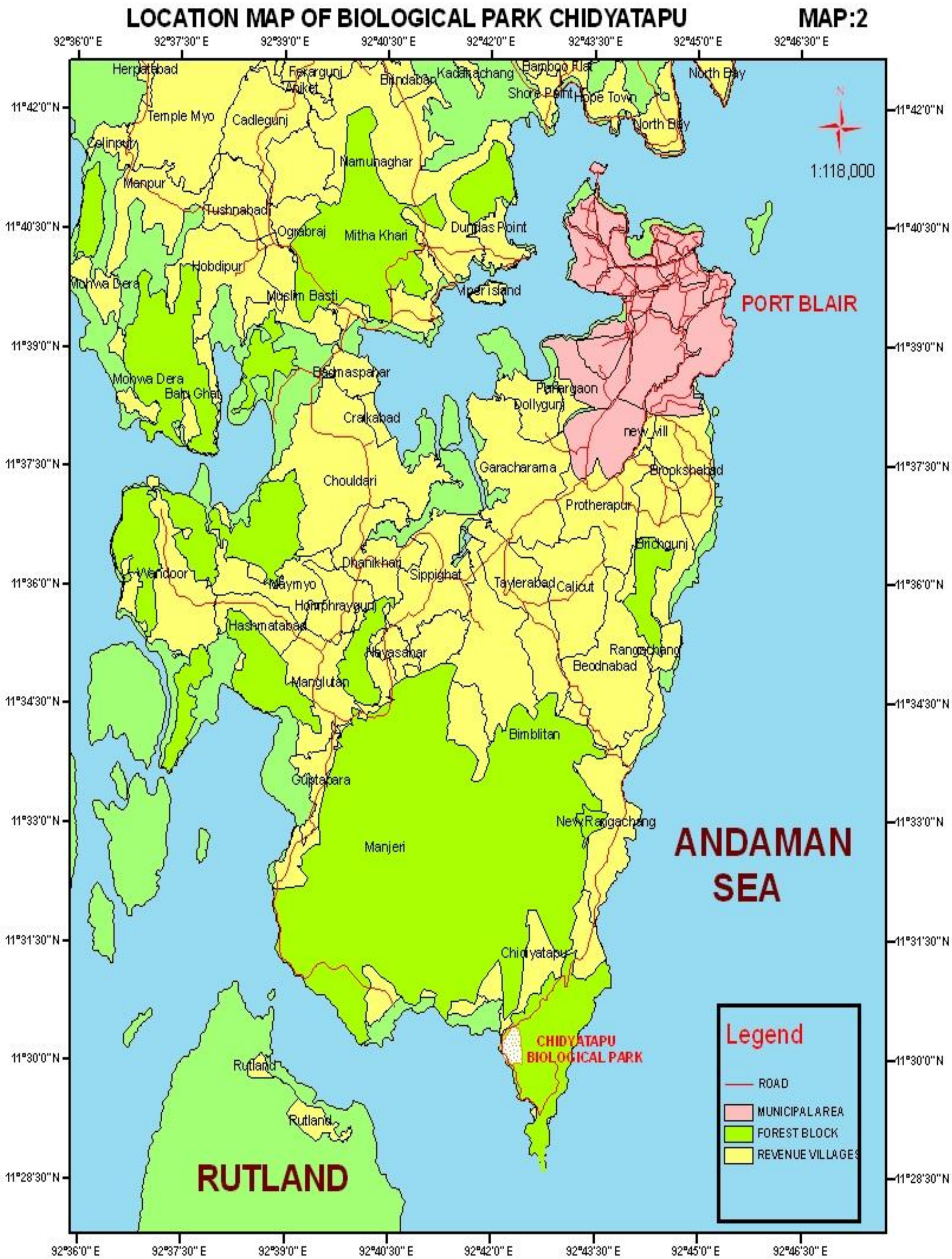
PART – III (B)

(ANNEXURE – 3)

MAPS & PLANS

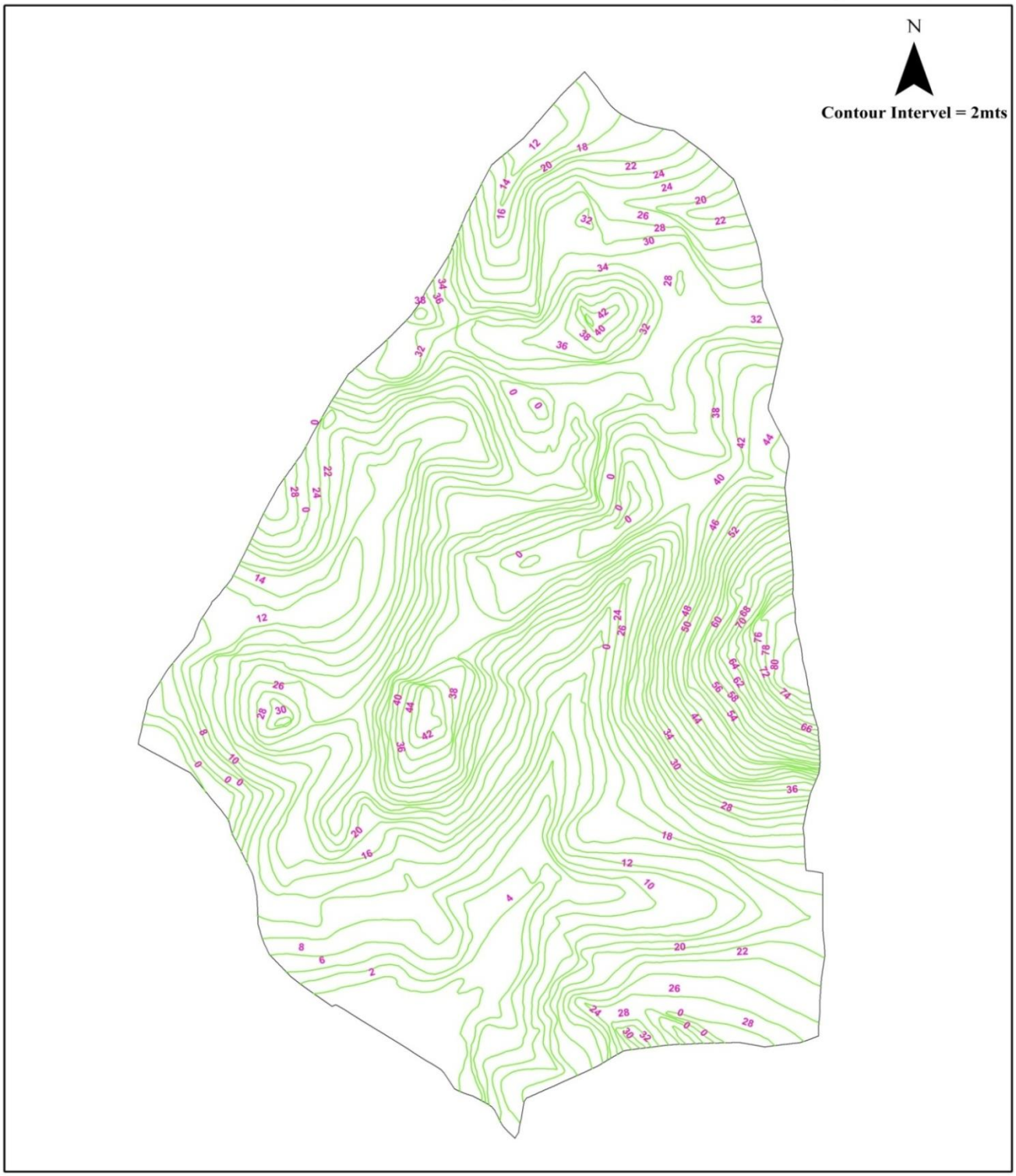
Location Map of Biological Park in A&N Islands(India)




LOCATION MAP OF BIOLOGICAL PARK CHIDYATAPU
MAP:2
1:118,000
PORT BLAIR
ANDAMAN SEA
RUTLAND
CHIDYATAPU BIOLOGICAL PARK
Legend
ROAD
MUNICIPAL AREA
FOREST BLOCK
REVENUE VILLAGES
Temple Myo
Cadlegunj
Namunaghar
Tushnabad
Mitha Khari
Hobdipur
Muslim Basti
Mohwa Dera
Chouldari
Garacharama
Protherapur
Dhanikhari
Sippighat
Calicut
Wandoor
Hashmatabad
Beodnabad
Bimblitan
Manjeri
Chidiyatapu
Rutland
North Bay
Hope Town
Shore Point
Dollygunj
Viper island
92°36'0" E
92°37'30" E
92°39'0" E
92°40'30" E
92°42'0" E
92°43'30" E
92°45'0" E
92°46'30" E
11°42'0" N
11°40'30" N
11°39'0" N
11°37'30" N
11°36'0" N
11°34'30" N
11°33'0" N
11°31'30" N
11°30'0" N
11°28'30" N

ANNEXURE-3
Map -3

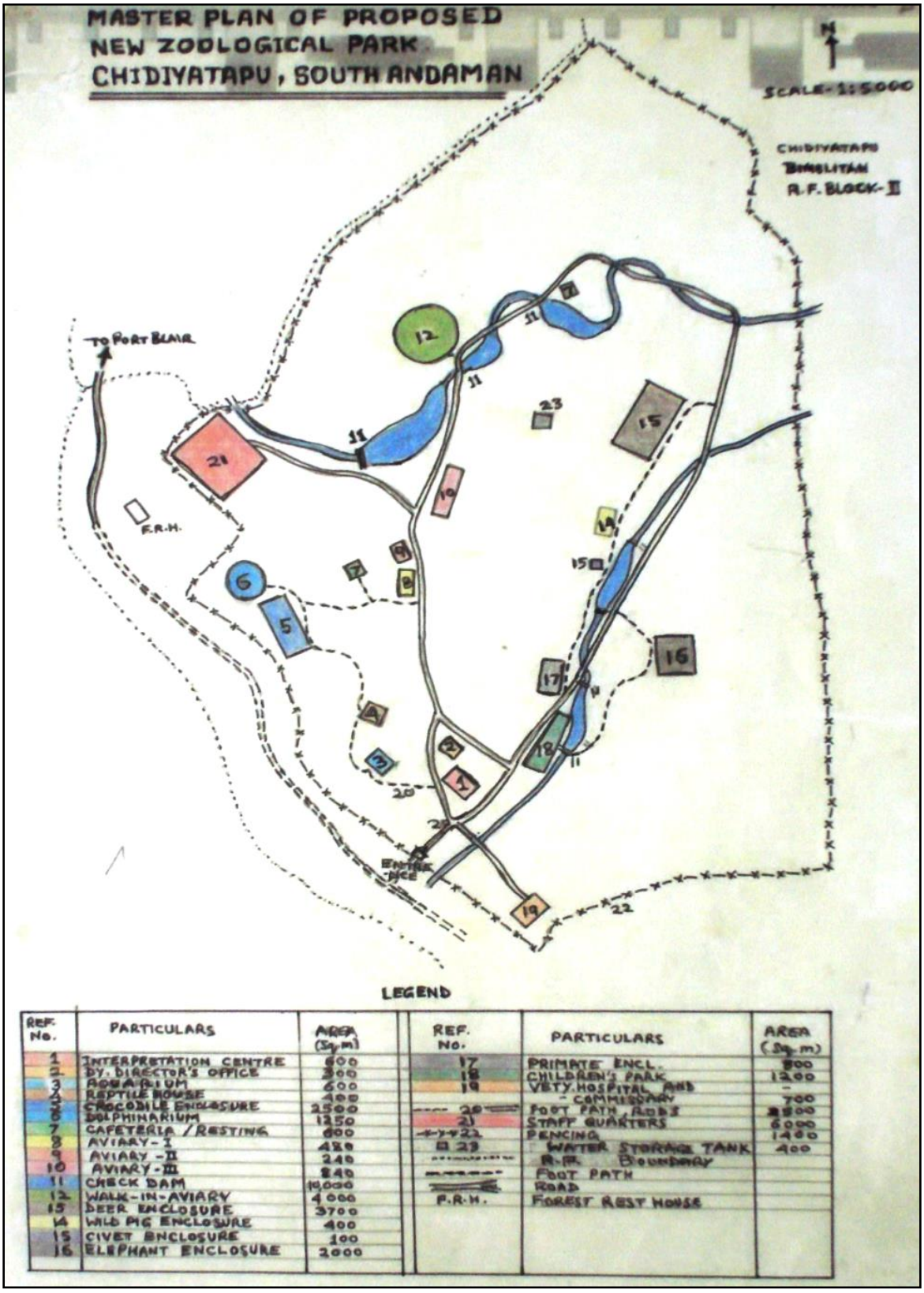
Contour Map of Biological Park,Chidiyatapu



ANNEXURE-4

Map-4

First MasterPlan of the Biological Park prepared in 1992



REF. No.	PARTICULARS	AREA (Sq.m)	REF. No.	PARTICULARS	AREA (Sq.m)
1	INTERPRETATION CENTRE	600	17	PRIMATE ENCL.	800
2	DY. DIRECTOR'S OFFICE	300	18	CHILDREN'S PARK	1200
3	AQUARIUM	600	19	VETY. HOSPITAL AND - COMMISSARY	- 700
4	REPTILE HOUSE	400	20	FOOT PATH / ROAD	2500
5	CROCODILE ENCLOSURE	2500	21	STAFF QUARTERS	6000
6	DOLPHINARIUM	1250	22	FENCING	1400
7	CAFETERIA / RESTING	600	23	WATER STORAGE TANK	400
8	AVIARY-I	420		R.F. BOUNDARY	
9	AVIARY-II	240		FOOT PATH	
10	AVIARY-III	240		ROAD	
11	CHECK DAM	10000	P.R.H.	FOREST REST HOUSE	
12	WALK-IN-AVIARY	4000			
13	DEER ENCLOSURE	3700			
14	WILD PIG ENCLOSURE	400			
15	CIVET ENCLOSURE	100			
16	ELEPHANT ENCLOSURE	2000			

Revised second Master (Layout) Plan of 1998

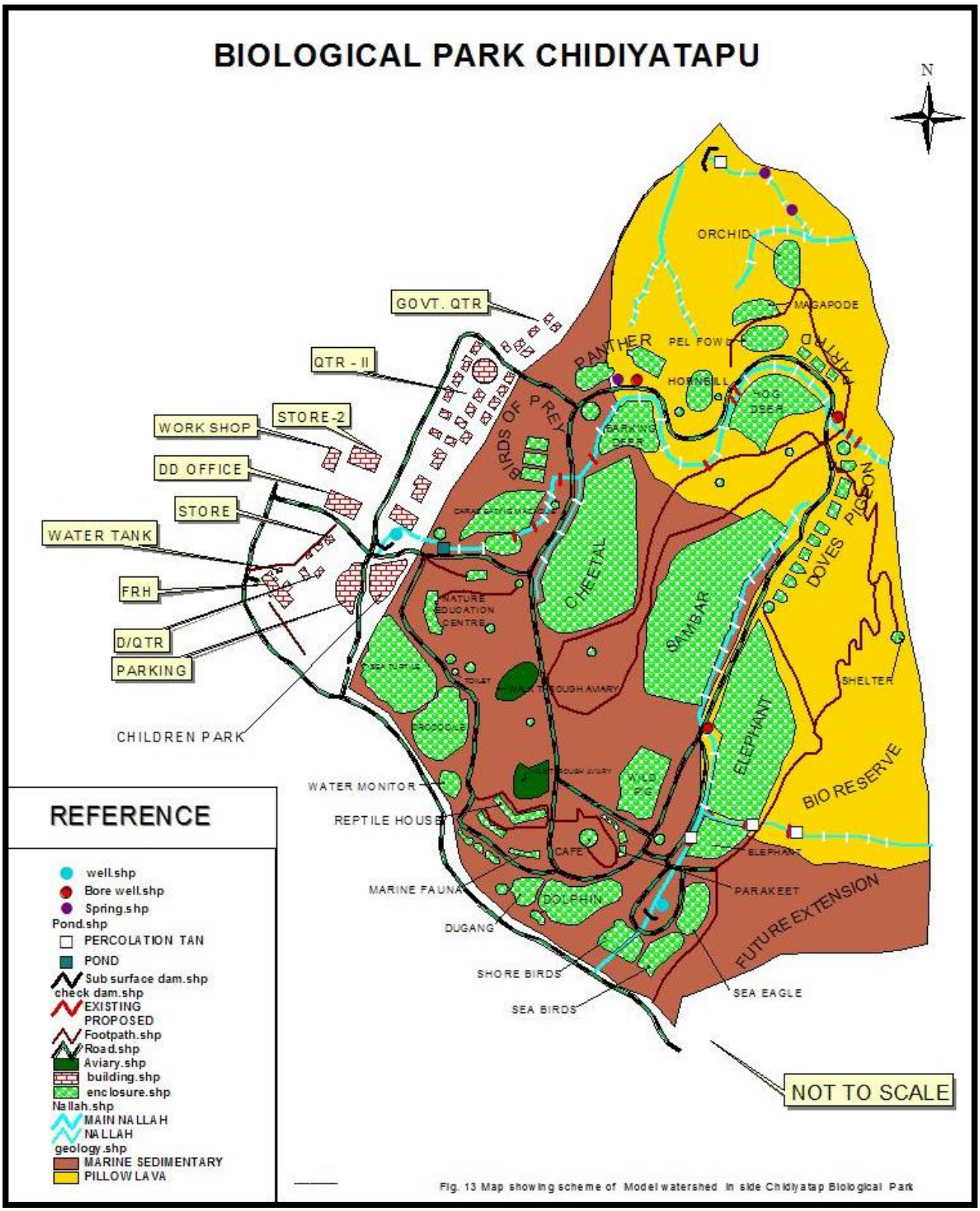


Fig. 13 Map showing scheme of Model watershed in side Chidiyatap Biological Park

MASTER PLAN ( )

BIOLOGICAL PARK, CHIDIYATAPU, SOUTH ANDAMAN

*** NOTE:** Master plan in 1:1000 scale is placed separately in the back cover as Map-4A

ANNEXURE-7
Map-7

MASTER PLAN
BIOLOGICAL PARK, CHIDIYATAPU, SOUTH ANDAMAN

ANNEXURE-8
Map-8

COUNTOUR MAP SHOWING BIOLOGICAL PARK, CHIDIYATAPU, SOUTH ANDAMAN

PROPOSED ELECTRIC LINE FOR BIOLOGICAL PARK, CHIDIYATAPU

ANNEXURE-10

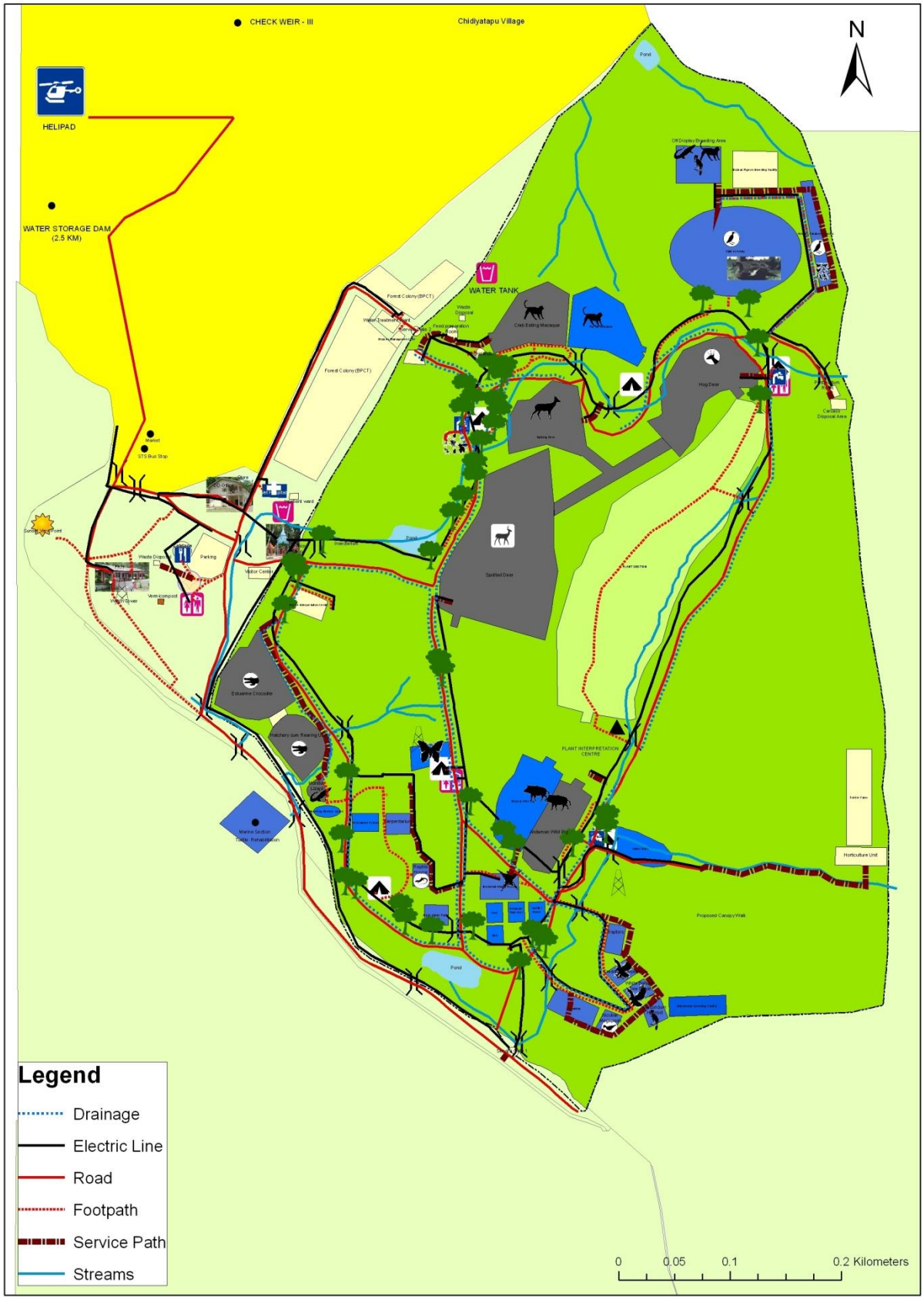
Map-10

WATER SUPPLY OF BIOLOGICAL PARK, CHIDIYATAPU

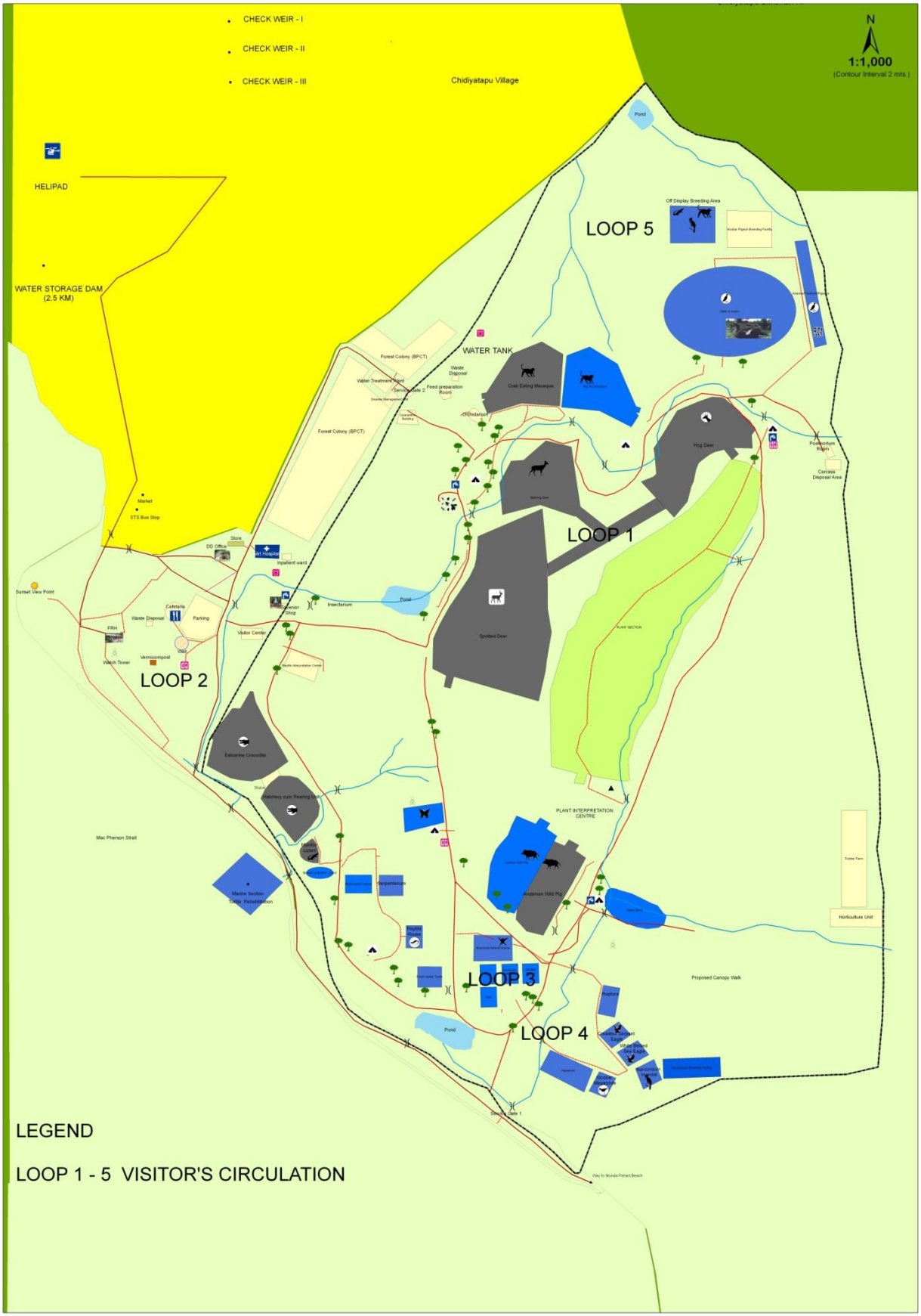
ANNEXURE-11

Map-11

SERVICE PATH FOR FEED DISTRIBUTION IN BIOLOGICAL PARK, CHIDIYATAPU



VISITOR'S CIRCULATION FOR BIOLOGICAL PARK, CHIDIYATAPU

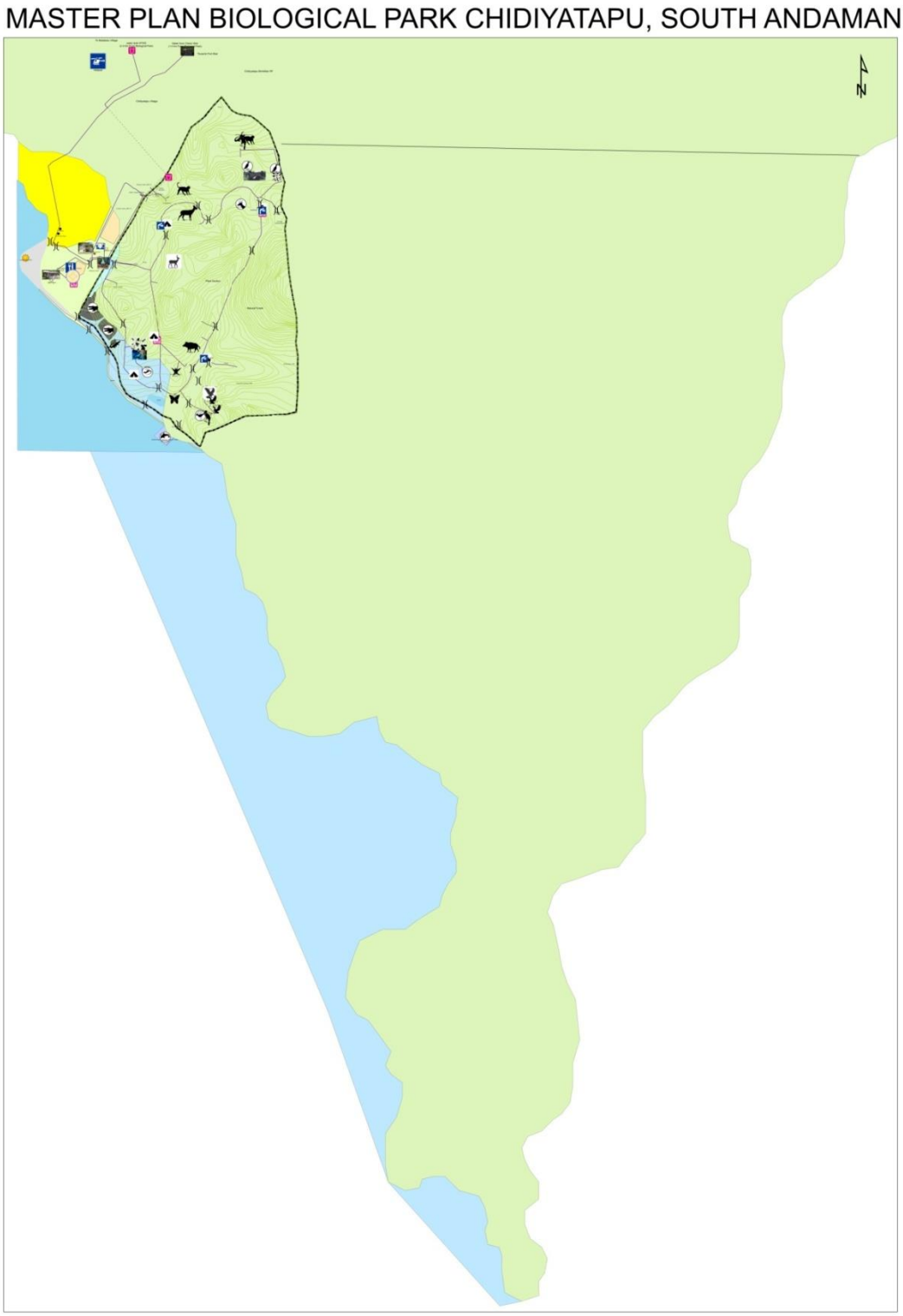


ANNEXURE-13

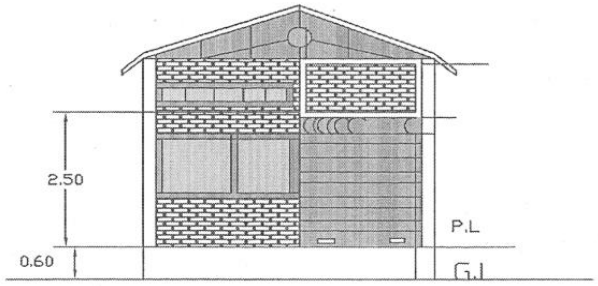
Map – 13

SERVICE PATH FOR FEED DISTRIBUTION IN BIOLOGICAL PARK, CHIDIYATAPU

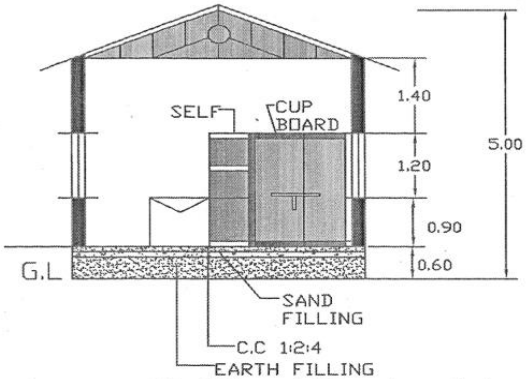
FUTURE PLAN OF BIOLOGICAL PARK, CHIDIYATAPU, SOUTH ANDAMAN



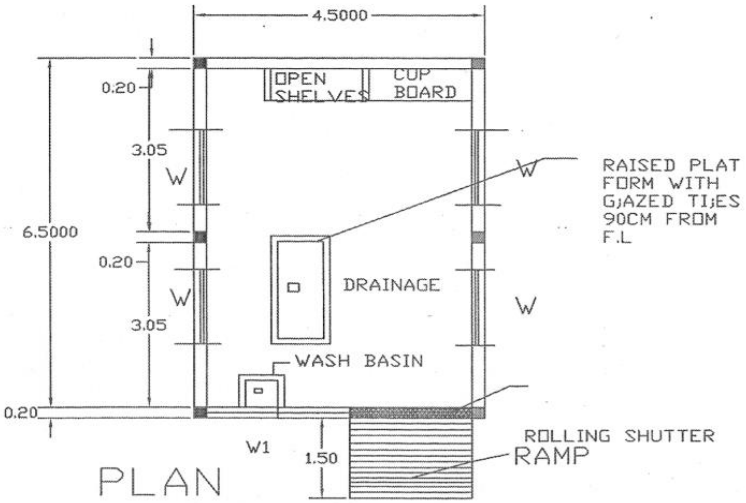
Plan of Post Mortem Building



ELEVATION



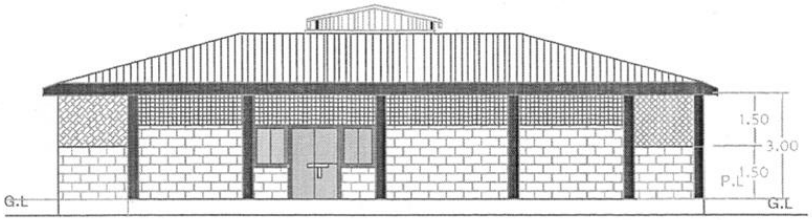
C/S AT A-A'



PLAN

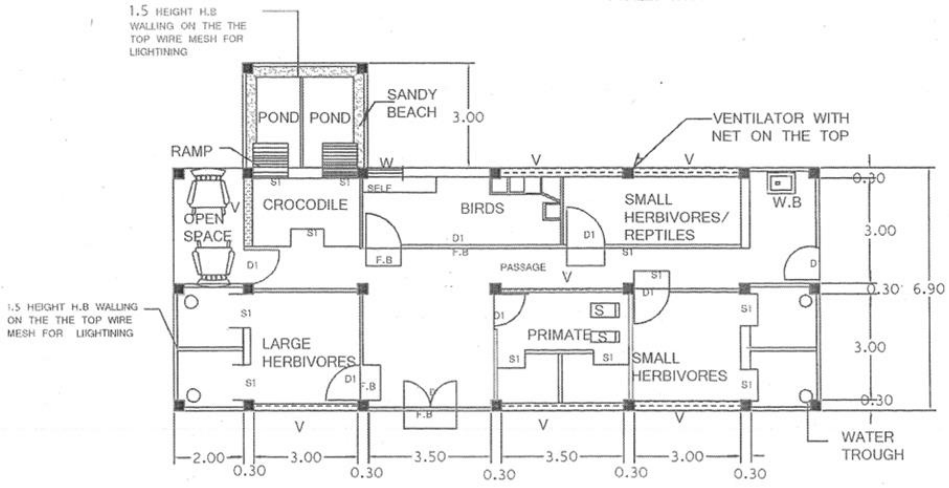
PLAN OF POST MORTEM ROO

PLAN OF QUARANTINE BUILDING

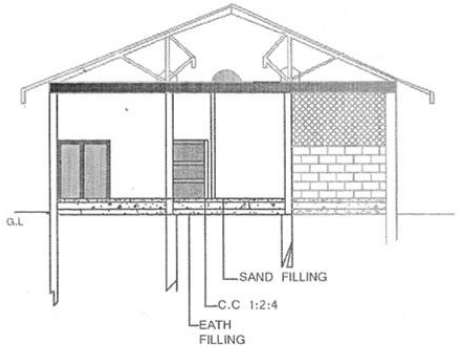


ELEVATION

SCALE:-1:100



PLAN



CROSS SECTION AT A-B

SCALE:-1:100

INDEX			
1		D-DOOR	1500X2100
2		D1-DOOR	100X2100
3		W-WINDOW	100X2100
4		S1- SLINDING DOOR	1000x2100
5		VENTILATOR WITH NET	
6		F.B FOOT BATH	

PLAN OF QUARANTINE ROOM

PART IV

ANNEXURES TO THE MASTER PLAN

ANNEXURE -1

F.No. 19-98/92-CZA
CENTRAL ZOO AUTHORITY
(Ministry of Environment & Forests)

Bikaner House,
Annexe 4, Shahjahan Road,
New Delhi - 110 011.

Dated : the 3rd May, 1993

The Chief Wildlife Warden
Andaman & Nicobar Islands,
Haddo, Port Blair.

ubject : Establishment of modern Zoological Park at Chidaitapu in South Andaman - Approval of the project.

ir,

I am to refer to your letter No. CWLW/WL/69/1012 dated 27th November, 1992 on the subject mentioned above and to say that Central Zoo Authority have no objection to the shifting of existing Mini Zoo to the new site at Chidaitapu in South Andaman as proposed by the administration. However, it may kindly be ensured that the planning of the proposed Zoological Park and various enclosures should be in accordance with the Recognition of Zoo Rules, 1992 and all new enclosures for various species are constructed with the approval of Central Zoo Authority.

(Yours faithfully,

(R.M.N. SAHAI)
MEMBER SECRETARY

ANNEXURE -2

GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

Paryavaran Bhavan,
CGO Complex, Lodi Road,
New Delhi : 110003.

No. 8-215/92-FC

Dated: 3.1.1997.

To

The Secretary,
Govt. of Andaman & Nicobar,
Department of Forest,
PORT BLAIR.

Sub : Diversion of 40 ha. of forest land for establishment of a Modern Zoological Park at Chidiyatapu in Andaman Distt.

.....

Sir,

I am directed to refer to this Ministry's letter of even number dated 11th May, 1994 conveying Central Government's approval, in principle, for diversion of 40 ha. of forest land for establishment of a modern Zoological Park at Chidiyatapu in Andaman Distt. and your subsequent D.O. letter No. CF/G/307/123 dated 13th Sept, 1995.

After careful consideration of the proposal of the State Govt., the Central Govt. hereby conveys its approval under Section of Forest (Conservation) Act, 1980 for diversion of 40 ha. of forest land for establishment of modern Zoological Park in Chidiyatapu in Andaman Distt. without making any stipulation regarding compensatory afforestation and subject to the following conditions :

(i) Legal status of the forest land will remain unchanged.

(ii) The land shall not be used for any purpose other than those specified in the proposal.

(iii) While establishing the Modern Zoo, advice, guidance and clearance from Central Zoo Authority will be obtained.

(iv) Any other condition that may be imposed by the State Forest Department in the interest of forest and wildlife conservancy.

Yours faithfully,

(D.C. KHANDURI)
SR. ASSTT. INSPECTOR GENERAL OF FORESTS

... /-

Copy to:

1. Principal Chief Conservator of Forests, Govt. of Andaman & Nicobar Administration, Port Blair.
2. Nodal Officer, Office of PCCF,
3. The CCF(Central), Regional Office, Bangalore.
4. RO(HQ), Ministry of Environment & Forest, New Delhi.
5. Guard file.

(D.C. KHANDURI)
SR.ASSTT. INSPECTOR GENERAL OF FORESTS

INVENTORY REPORT FOR THE SCHEDULED ANIMALS OF BIOLOGICAL PARK, CHIDIYATAPU AS ON 31.08.2016

Sl No	NAME OF ANIMALS	STOCK AS ON 01.08.2016				DURING THE ABOVE PEROID												STOCK AS ON 31.08.2016				REMARKS
						BIRTH				ACQUISITION				DEATH								
I.	**SCHEDULE-I ANIMALS**	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T	
1.	**MAMMALS**																					
i.	Andaman Wild Pig, *Sus scroffa andamanensis*	01	02	03	06	-	-	-	-	-	01	-	01	-	-	-	-	01	03	03	07	
ii.	Crab eating macaque , Macaque	02	03	01	06	-	-	-	-	-	-	-	-	-	-	-	-	02	03	01	06	
2.	**REPTILES**																					
i.	Salt water crocodile, *Crocodylus porosus*	02	06	01	09	-	-	-	-	-	-	-	-	-	-	-	-	02	06	01	09	
ii.	Water monitor Lizard, *Varanus salvator*	02	01	06	09	-	-	-	-	-	-	-	-	-	-	-	-	02	01	06	09	
3.	**BIRDS**																					
i.	White bellied sea eagle, *Haliaetus leucogaster*	-	-	01	01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	01	01	
ii.	Andaman dark serpent eagle, *Spilornis elgini*	-	-	04	04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	04	04	
II.	**SCHEDULE-I I ANIMALS**	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	
1.	MAMMALS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2.	REPTILES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3.	BIRDS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.	TOTALS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
III.	**SCHEDULE - III ANIMALS**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
i.	Spotted Deer, *Axis axis*	27	29	11	67	-	-	-	-	-	-	-	-	-	-	-	-	27	29	11	67	
ii.	Barking Deer, *Muntiacus muntjak*	02	00	00	02	-	-	-	-	-	01	-	01	-	-	-	-	02	01	-	03	
IV.	**SCHEDULE - IV BIRDS**																					
i.	Andaman green imperial Pigeon	-	-	-	-	-	-	-	-	-	-	32	32	-	-	-	-	-	-	32	32	
ii.	Red breasted Parakeet	-	-	-	-	-	-	-	-	-	-	02	02	-	-	-	-	-	-	02	02	
iii.	Alexandrine Parakeet	-	-	-	-	-	-	-	-	-	-	02	02	-	-	-	-	-	-	02	02	
	GRAND TOTAL	**36**	**41**	**27**	**104**	**-**	**-**	**-**	**-**	**-**	**02**	**36**	**38**	**-**	**-**	**-**	**-**	**36**	**43**	**63**	**142**	

Note:-1. Received one No rescued Barking deer (unsex) from RO,Kalra WL Division vide L.No-RO/WL/KL/G-7/234dated 14.8.2016 on dated 14.08.2016 .
(Kept in in-patient ward CTBP).

2. Received Andaman green imperial Pigeon -32 Nos, Red breasted Parakeet 02 Nos, Alexandrine Parakeet 02 Nos ,(unsex) from RO, Mini Zoo, WL Division , Haddo Vide Invoice No-22 dated 25.8.2016 on dated 25.08.2016.

3. One No Andaman wild Pig (Female) Injured/Fracture in front right leg received from RO, Mannarghat S A Division on dated 28.08.2016
(Kept in in-patient ward CTBP).

DEPUTY DIRECTOR
Biological Park Chidiyatap

TABLES

ANNEXURE - 4 (Table-1)

Faunal diversity and Endemism in A&N islands

Animal Group	No of species/ subspecies	No. of endemics	% Endemism
Terrestrial Fauna			
Mammalia	58	32	55.2
Aves	246	99	40.2
Reptilia	78	27	34.6
Amphibia	20	8	40.0
Mollusca	110	77	70.0
Arachnida	94	38	40.4
Hemiptera	146	22	15.0
Diptera	214	24	11.2
Coleiotera	878	92	10.5
Lepidoptera	426	52	12.2
Isoptera	40	19	47.5
Odonata	36	4	11.1
Annelida	30	9	30.0
TOTAL	**2,376**	**503**	**21.17**
Marine fauna			
Mammalia	7	-	-
Reptilia	12	-	-
Pisces	1,200	2	0.2
Echinodermata	350	4	0.4
Mollusca	1,000	18	1.9
Crustacea	600	6	1.0
Polychaeta	184	4	2.2
Anthozoa	326	2	0.6
Porifera	72	-	-
Meiofauna	490	102	21.0
TOTAL	**4,241**	**138**	**0.11**

ANNEXURE - 5 Table-2

Details of existing animal enclosures in Phase I and II

S.No	Enclosure	Area	Type	Moat Type	Moat Length	Moat Width	Depth	Dimension of animal house/night shelter
1.	**Andaman Wild Pig**	2972 Sqm	Open –Air	One sided Shallow Wet Moat	112.60	4 m	2 m	One animal house of size 11m X 5m with 2 cells of the size 2.6m X 1.0m X 1.25m each
2.	**Spotted Deer**	11347 Sqm	Open -Air	One sided vshape dry Moat	134 m	6 m	2.5 m	One animal house of size 11m X 5m with 2 cells of the size 2.6mX1.0mX1.25m each
3.	**Hog Deer**	4648 Sqm	Open -Air	One sided V shape dry moat	162 m	6 m	2.5 m	One animal house of size 11mX5m with 2 cells of the size 2.6mX 1.0mX 1.25m each
4.	**Barking Deer**	2721 Sqm	Open air	One sided V shape dry moat	99 m	6 m	2.5 m	One animal house of size 11mX5m with 2 cells of the size 2.6mX 1.0mX 1.25m each
5.	**Crab eating Macaque**	2785 Sqm	Open air	One sided wet moat	57m	5 m	4.1 m	One animal house of size 9.30 m X 4.40 m with 2 cells of the dimension 2.40 m x 2.80 m x 2.90 m each
6.	**Water Monitor Lizard**	238 Sqm	Open air	No moat				
7.	**Salt Water Crocodile enclosure**	1760 Sqm	Open air	No moat				

	(Breading pair)							
8.	**New Crocodile Enclosure** **(Converted from Turtle enclosure)**	3091 Sqm	Open air	No moat				
9.	**Plant Section** **(Modified from Samber enclosure)**		Open air	No moat				
10.	**White Bellied Sea Eagle Enclosure**	300 Sq.m	Enclosed	No moat				One animal house bifurcated into two sections for service & animals health care.
11.	**Andaman Dark Serpent Eagle Enclosure**	300 Sq.m	Enclosed	No moat				One animal house bifurcated into two sections for service & animals health care.
12.	**Andaman Red Breasted parakeet**	80 Sq.m	Enclosed	No moat				Animal House attached
13.	**Andaman Green imperial Pigeon**	80 Sq.m	Enclosed	No moat				Animal House attached
14.	**Andaman Red Checkered Parakeet**	80 Sq.m	Enclosed	No moat				Animal House attached
15.	**Alexandrian Parakeet**	80 Sq.m	Enclosed	No moat				Animal House attached
16.	**Andaman Emerald Dove**	80 Sq.m	Enclosed	No moat				Animal House attached
17.	**Nicobar Pigeon**	80 Sq.m	Enclosed	No moat				Animal House attached

ANNEXURE - 6 Table-3

Enclosures to come in future of Phase II and III							
1	**Nicobar megapod Enclosure**	300 Sq.m	Enclosed	No moat			
2	**Narcondam hornbill display enclosure**	300 Sq.m	Enclosed	No moat			
3	**Narcondam hornbill Breeding enclosure**	600 Sq mtrs	Enclosed	No moat			
4	**Andaman caucal enclosure**	80 Sq.m	Enclosed	No moat			
5	**Andaman wood pecker enclosure**	80 Sq.m	Enclosed	No moat			
6	**Andaman tree pie enclosure**	80 Sq.m	Enclosed	No moat			
7	**Andaman teal and water hen and moorhen enclosure**	80 Sq.m	Enclosed	No moat			
8	**Pigeons enclosure**	80 Sq.m	Enclosed	No moat			
9	**Andaman crake**	80 Sq.m	Enclosed	No moat			
10	**Andaman Wood Pigeon (*Columba palumbodies*)**	80 Sq.m	Enclosed	No moat			
12	**Enclosure for Raptors (**Andaman Baza) etc.	300 Sq.m	enclosed	No moat			
13	**Reptile House (enclosures)**	40 sq mts each 12 nos	enclosed	No Moat			
	a.Andaman Gecko						
	b.Red Bow Fingered Gecko		enclosed				
	c.Nicobar bend toed Gecko		enclosed				
	d.Nicobar tree Skink		enclosed				
	e.Tytlers Skink		enclosed				
	f.White striped Skink		enclosed				
	g.Green Forest Lizard		enclosed				
	h.Andaman Day		enclosed				
	i.Andaman Gaint Gecko		enclosed				
	j.Comman Garden Lizard		enclosed				
	k.Brook's House Gecko		enclosed				
	l. Andaman Rock Gecko		enclosed				
14	**Serpentarium** (enclosures) a.King Cobra	80 Sq mtrs	enclosed				
	b.Dibamus nicobaricus	40 sq mtrs each	enclosed				
	c.Andaman Cobra		enclosed				
	d.Andaman Krait		enclosed				
	e.Andaman Pit Viper		enclosed				
	f.Andaman Banded Kukri		enclosed				
	g.Andaman Wolf snake		enclosed				
	h.Red Tailed Trinket		enclosed				
	i.Nicobar Sand Boa		enclosed				
	j.Andaman Cat Snake		enclosed				
	k. Andaman Dog Faced Water snake						

	l. Andaman Rat Snake						
15	**Nocturnal Animal House (enclosures)** **a.Mammals** 1.Andaman palm civet	80 sq mtr	enclosed				
	2.Nicobar tree Shrew	40 sq mtrs each	enclosed				
	3.Nicobar Spiny Shrew		enclosed				
	4 .Andaman Spiny Shrew		enclosed				
	5.Malaysian Wood Rat		enclosed				
	6.Jungle Cat	80 sq mtrs	enclosed				
	b. bats (Three spps) **1**Andaman short nosed fruit bat **2** Lesser false vampire **3** Nicobar long fingered bat	Natural open house					Ex-situ conservation Open enclosure (Nicobar bat to be enclosed)
	c. Birds.						
	1.Owls (Three Spps)	40 Sq Mtrs	enclosed	No Moat			
	2.Swiftlets(two spps**)**	Natural open house					Ex-situ conservation Open enclosure
16	**Enclosure for Reticulated Python**	300 Sq Mtrs	enclosed				
17	**Marine Aquarium** **20+2+4+4=30 long(10 m either side +2 m glass tunnel+ 4m tapering walls for reef structure 30X20=600 sq mtrs** **Marine fishes, Coral Reef, Marine Sponges, Sea Urchin, Sharks and Rays.**	600 sq mtrs	Open	No moat			Swimming pool type tank with under water glass opening for visitors
18	**Walk through Aviary**	12000 Sq Mtrs	Enclosed				Enclosure over forest canopy
19	**Turtle Rescue and Rehabilitation enclosure**	2.00 Ha	Open enclosure	No moat			20 mtrs Over bridge for visitors
20	**Fresh water turtle house (Indian flap shell turtle and Malayan box turtle)**	600 sq meters	Closed enclosure	No moat			Fresh water pond 50% area
21	**Enclosures of water birds**	1600 sq meters					Fresh water pond 50% area
22	**Gaint Robber Crab enclosure**	40 sq. meters	Closed enclosure	No moat			20% water pond area
23	**Pig Tailed Macaque enclosure**	2500 sq. meters	Open enclosure	One sided wet moat	50x5 x4 meter		One animal house similar to crab eating Macaque
24	**Nicobar Wild Pig enclosure**	2000 Sq.meter	Open	One sided shallow wet Moat	50x4 x2 meters		One Animal House similar to Andaman Wild Pig

Inventory (existing animal collection) of the Biological Park, Chidiyatapu is placed at Annexure – 7

ANNEXURE - 7 Table-4

Sl. No.		Animals	Present Stock				Proposed Collection				Animals to be acquired/ removed				Remarks Source of acquisition
			M	F	U	T	M	F	U	T	M	F	U	T	
A		**Class: Reptilia**													
	1	**Snakes (Serpentarium)**													
	1.1	King Cobra	0	0	0	0	01	02	-	03					
	1.2	Andaman Cobra	0	0	0	0	01	02	-	03					
	1.3	Andaman Krait	0	0	0	0	01	02	-	03					
	1.4	Andaman Pit Viper	0	0	0	0	01	02	-	03					
	1.5	Andaman Banded Kukris	0	0	0	0	01	02	-	03					
	1.6	Andaman Wolf Snake	0	0	0	0	01	02	-	03					
	1.7	Reticulated python	0	0	0	0	01	02	-	03					
	1.8	Red Tailed Trinket	0	0	0	0	01	02	-	03					
	1.9	Andaman Dog Faced Water Snake	0	0	0	0	01	02	-	03					
	1.10	Andaman Rat Snake	0	0	0	0	01	02	-	03					
	1.11	Dibamus Nicobaricus	0	0	0	0	01	02	-	03					
	1.12	Andaman Cat Snake	0	0	0	0	01	02	-	03					
	2	**Lizards, Geckos & Skinks (Reptile House)**													
	2.1	Andaman Gecko	0	0	0	0	01	02	-	03					
	2.2	Red Bow Fingered Gecko	0	0	0	0	01	02	-	03					
	2.3	Nicobar bend toed Gecko	0	0	0	0	01	02	-	03					
	2.4	Nicobar tree Skink	0	0	0	0	01	02	-	03					
	2.5	Tytlers Skink	0	0	0	0	01	02	-	03					
	2.6	White Striped Skink	0	0	0	0	01	02	-	03					
	2.7	Green Forest Lizard	0	0	0	0	01	02	-	03					
	2.8	Andaman Day	0	0	0	0	01	02	-	03					
	2.9	Andaman Giant Gecko	0	0	0	0	01	02	-	03					
	2.10	Andaman Garden Lizard	0	0	0	0	01	02	-	03					

	2.11	Brook's House Gecko	0	0	0	0	01	02	-	03					
	2.12	Andaman Rock Gecko	0	0	0	0	01	02	-	03					
	2.13	Andaman Water Monitor Lizard	1	1	6	8	0	0	0	0					
	3	**Crocodiles**													
	3.1	Salt Water Crocodile	2	6	1	9	0	0	0	0					
	4	**Turtles & Tortoises**													
	4.1	Indian flap shell turtle	0	0	0	0	0	0	0	0					To be shifted from Mini Zoo , Haddo
	4.2	Malayan box turtle	0	0	0	0	0	0	0	0					To be shifted from Mini Zoo, Haddo
B		**Class: Aves**													
	1	**Water Birds**													
	1.1	Andaman Crake	0	0	0	0	02	04	-	06					
	1.2	Andaman teal	0	0	0	0	02	04	-	06					
	1.3	Moorhen	0	0	0	0	02	04	-	06					
	1.4	Andaman white breasted water hen	0	0	0	0	02	04	-	06					
	1.5	Common teal	0	0	0	0	02	04	-	06					
	1.6	Pond Heron	0	0	0	0	02	04	-	06					
	2	**Doves & Pigeons**													
	2.1	Nicobar Pigeon	0	0	0	0	02	04	-	06					
	2.2	Andaman Green Pigeon	0	0	0	0	02	04	-	06					
	2.3	Andaman Green Imperial Pigeon	32			32	0	0	0	0					
	2.4	Andaman Emerald Dove	0	0	0	0	02	04	-	06					
	2.5	Red Collared Dove	0	0	0	0	02	04	-	06					
	2.6	Andaman Wood Pigeon	0	0	0	0	02	04	-	06					
	2.7	Andaman Cuckoo Dove	0	0	0	0	02	04	-	06					
	2.8	Red Collared Dove	0	0	0	0	02	04	-	06					
	3	**Swiftlets**													
	3.1	White Bellied Swiftlet	0	0	0	0	02	04	-	06					
	3.2	Edible Nest Swiftlet	0	0	0	0	02	04	-	06					
	4	**Parakeets & Lorikeets**													
	4.1	Andaman Red breasted parakeet	02		0	0	02	04	-	06					
	4.2	Alexandrine parakeet	02		0	0	02	04	-	06					
	4.3	Andaman Red cheeked parakeet	0	0	0	0	02	04	-	06					

	4.4	Indian hanging parrot	0	0	0	0									
	5	**Hornbills**													
	5.1	Narcondam Horn Bill	0	0	0	0	01	02	-	03					For Display
							02	02	-	04					For conservation breeding
	6	**Megapodes**													
	6.1	Nicobar megapode	0	0	0	0	02	04	-	06					For Display
							04	10	-	14					For conservation breeding
	7	**Hawks & Eagle**													
	7.1	Black baza	0	0	0	0	02	04	-	06					
	7.2	Nicobar serpent eagle	0	0	0	0	02	04	-	06					
	7.3	Changeable hawk eagle	0	0	0	0	02	04	-	06					
	7.4	Peregrin falcon	0	0	0	0	02	04	-	06					
	7.5	Andaman creasted hawk eagle	0	0	0	0	02	04	-	06					
	7.6	Andaman pale serpent eagle	0	0	0	0	02	04	-	06					
	7.7	White bellied sea eagle	01		-	01	02	04	-	06					
	7.8	Andaman dark serpent eagle	05		-	05	02	04	-	06					
	8	**Owls**													
	8.1	Andaman scops owl	0	0	0	0	02	04	-	06					
	8.2	Brown hawk owl	0	0	0	0	02	04	-	06					
	8.3	Andaman hawk owl	0	0	0	0	02	04	-	06					
	9	**Other bird species**													
	9.1	Andaman wood pecker	0	0	0	0	02	04	-	06					
	9.2	Andaman Fulvous-breasted Pied Wood Pecker	0	0	0	0	02	04	-	06					
	9.3	Andaman coucal	0	0	0	0	02	04	-	06					
	9.4	Minivet	0	0	0	0	02	04	-	06					
	9.5	Oriental magpie-robin	0	0	0	0	02	04	-	06					
	9.6	White-headed starling	0	0	0	0	02	04	-	06					
	9.7	Andaman bulbul	0	0	0	0	02	04	-	06					
	9.8	Thrush	0	0	0	0	02	04	-	06					
	9.9	Flycatchers	0	0	0	0	02	04	-	06					
	9.10	Andaman Cockoo Shrike	0	0	0	0	02	04	-	06					

	9.11	Warbler	0	0	0	0									
	9.12	Andaman Hill Myna	0	0	0	0	02	04	-	06					
	9.13	Nicobari Fowl	0	0	0	0	02	04	-	06					
	9.14	Andaman Jungle Crow	0	0	0	0	02	04	-	06					
	9.15	Andaman Shama	0	0	0	0	02	04	-	06					
	9.16	Asian Fairy Blue Bird	0	0	0	0	02	04	-	06					
	9.17	Andaman Koel	0	0	0	0	02	04	-	06					
	10	**Orioles**													
	10.1	Black Naped Oriole	0	0	0	0	02	04	-	06					
	10.2	**Drongos**													
	10.3	Andaman Racket Tailed Drongo	0	0	0	0	02	04	-	06					
	10.4	**Aquatic birds**													
	10.5	Andaman teals	0	0	0	0	02	04	-	06					
	10.6	Moor hen	0	0	0	0	02	04	-	06					
	10.7	King fishers	0	0	0	0	02	04	-	06					
	10.8	Bittern	0	0	0	0	02	04	-	06					
	10.9	Egrets	0	0	0	0	02	04	-	06					
	10.10	Andaman Treepie	0	0	0	0	02	04	-	06					
C	**1**	**Class: Mammalia**													
	1.1	Andaman Wild Pig	03	03	-	06	-	-	-						The wild pig is breeding in the park
	1.2	Nicobar Wild Pig	0	0	0	0	02	06	-	08					
	1.3	Crab Eating Macaque	04	03	-	07	02	02	-	04					For restoring the natural composition of the group for breeding
	1.4	Pig-tailed Macaque	0	0	0	0	02	04	-	06					
	1.5	Hog Deer	0	0	0	0	02	08	-	10					
	1.6	Barking Deer	01	02	-	03	02	08	-	10					
	1.7	Chital	0	0	0	0	02	04	-	06					
	1.8	Andaman palm civet	0	0	0	0	02	04	-	06					
	1.9	Andaman jungle cat	0	0	0	0	02	04	-	06					
	1.	Nicobar Tree Shrew	0	0	0	0	02	04	-	06					

	10														
	1.11	Nicobar Spiny Shrew	0	0	0	0	02	04	-	06					
	1.12	Andaman spiny Shrew	0	0	0	0	02	04	-	06					
	1.13	Malaysian Wood Rat	0	0	0	0	02	04	-	06					
	1.14	Andaman Ground Shrew	0	0	0	0	02	04	-	06					
	2	**Bats**													
	2.1	Andaman Short nosed fruit bat	0	0	0	0	02	04	-	06					
	2.2	Lesser False Vampire Bat	0	0	0	0	02	04	-	06					
	2.3	Nicobar Long fingered bat													
	2.4	Andaman flying fox	0	0	0	0	02	04	-	06					
	2.5	Andaman Horse shoe bat	0	0	0	0	02	04	-	06					
	3	**Insects and Butterflies**													
	3.1	Butterflies	0	0	0	0	0	0	0	0					Locally available species as listed in the free ranging butterflies
	3.2	Insects	0	0	0	0	0	0	0	0					Locally available species as listed in the free ranging butterflies
	4	**Aracanids**													
	4.1	Spiders	0	0	0	0	0	0	0	0					Free ranging Spiders
	5	**Molluscs and Crabs**													
	5.1	Giant robber crab	0	0	0	0	02	04	-	06					
D		**EXOTICS**									Under the exchange programme under Central Zoo Authourity.				
	1	**Class: Aves**													
	1.1	Emu	0	0	0	0	02	04	-	06					
	1.2	Ostrich	0	0	0	0	02	04	-	06					
	1.3	Blue Yellow Macaw	0	0	0	0	02	04	-	06					
	1.4	Military Macaw	0	0	0	0	02	04	-	06					
	2	**Class: Mammalia**													
	2.1	Giraffe	0	0	0	0	01	01	-	02					
	2.2	Zebra	0	0	0	0	01	02	-	03					
	2.3	Chimpanzee	0	0	0	0	01	02	-	03					

Annexure – 8, Table – 5)

Proposed development of the Veterinary Hospital at the Biological Park, Chidiyatapu

S.No	Officials	Numbers of Posts
1.	Junior Veterinary Officer (JVO)/ (Assistant Veterinary Surgeon)	01
2.	Veterinary Compounder	01
3.	Veterinary Dresser/Attendants	04
4.	Mobile van	01

(Annexure – 9, Table -6)

Conservation Breeding plan

S.No	Name of the animal	Coordinating Zoo	Participating Zoo
1.	Crab Eating Macaque	Biological Park, Chidiyatapu	-
2.	Nicobar Pigeon	-do-	Ahmedabad
3.	Water Monitor Lizard	-do-	Mammalapuram
4.	Narcondam Hornbill	-do-	A S-E Asian Zoo specializing in breeding Hornbills
5.	Nicobar Megapode	-do-	-

ANNEXURE – 10, Table-7

Plant Field-identification & collection plan for Phase-II and III

Sl. No	Groups	Remarks
A	**Forest Groups**	
1	Important species of Giant Evergreen Forests	Important species of Andaman And Nicobar Islands will be represented in the plant section and other forests of the Biological Park. All the species representing the forest types will be identified and marked for field reference and study. Deficient species of each group will be added in the Biological Park.
2	Important species of Andaman Tropical Evergreen Forests	
3	Important species of Southern Hilltop Tropical Evergreen Forests	
4	Cane brakes	
5	Wets Bamboo brakes	
6	Important species of Andaman Semi Evergreen Forests	
7	Important species of Andaman Moist Deciduous Forests	
8	Important species of Andaman Secondary Moist Deciduous Forests	
9	Important species of Littoral Forests	
10	Important species of Tidal Swamp Forests	
11	Important species of Sub Montane Hill Valley Swamp Forests	
B	**Plant Groups**	
1	Rare endangered and threatened plants of A & N Islands	Important species of Andaman And Nicobar Islands will be represented in the plant section and other forests of the Biological Park. All the species representing the forest types will be identified and marked for field reference and study. Deficient species of each group will be added in the Biological Park.
2	Orchids of A & N Islands	
3	Important Pteridophytes of A & N Islands	
4	Palms of A & N Islands	
5	Aroides, Zingibers and Marantaeae of A & N Islands	
6	Figs tree (Ficus species) of A & N Islands	

Annexure – 11, Table-8

Bamboo Species proposed in Bamboosetum at the Biological Park, Chidiyatapu	
S.No.	**Species**
1	*Gigantochloa andamanica*
2	*Bambusa atra*
3	*Bambusa schizostachyoides*
4	*Dinochloa andamanica*
5	*Schizostachyum rogersii*
6	*Schizostachyum kalpongensis*
7	*Schizostachyum andamanicum*

Annexure - 12, Table -9

Species proposed in conservatory of Screw Pines at the Biological Park, Chidiyatapu	
S.No.	**Species**
1	*Freycinetia insignis*
2	*Freycinetia scandens*
3	*Pandanus andamanensis*
4	*Pandanus furcatus*
5	*Pandanus leram*
6	*Pandanus odoratissimus*
7	*Pandanus tectorius*

Annexure - 13, Table-10.

Species proposed in conservatory of Aroides, Zingibers and Marantaceae members	
S.No.	**Species**
Aracaceae	
1	*Amorphophallus longistylus*
2	*A. carnosus*
3	*A.oncophyllus*
4	*A. companulatus*
5	*Araesema saddlepekensis*
Zingiberaceae	
6	*Alpinia manii*
7	*A. phoenicea*
8	*Amomum aculleatum*
9	*A. fenzlii*
10	*A. maximum*
11	*Boesenbergia rotunda*
12	*Costus speciosus*
13	*Curcuma mangga*
14	*C. petiolata*
15	*C.zeodaria*
16	*Globba marantina*
17	*G. pauci flora*
18	*G. versicolor*
19	*Kaempferia siphonantha*
20	*Zingiber aromaticum*

21	*Z.officinale*
22	*Z. spectabile*
23	*Z. squarrosum*
24	*Z. zerumbet*
Marantaceae	
25	*Donax cannaeformis*
26	*Phrynium capitatum*
27	*P.paniculatum*
28	*P. pubinerve*
29	*Stachyphrynium cadellianum*

Annexure - 14, Table-11

Species of Piperaceae proposed in Conservatory at the Biological Park, Chidiyatapu	
S.No.	**Species**
1	*Piper betle*
2	*Piper caninum*
3	*Piper clypeatum*
4	*Piper longum*
5	*Piper miniatum*
6	*Piper pedicellosum*
7	*Piper ribesioides*
8	*Piper sumatranum*

Annexure - 15, Table-12

Conservatory of important ornamental plants proposed at the Biological Park, Chidiyatapu		
Sl. No.	**Scientific Name**	**Family**
1	*Crateva religiosa*	Capparidaceae
2	*Xanthophyllum andamanicum*	Xanthophyllaceae
3	*Thespesia populnea*	Malvaceae
4	*Podocarpus nerifolia*	Podocarpaceae
5	*Murraya paniculata*	Rutaceae
6	*Paramignya andamanica*	Rutaceae
7	*Nephelium longana*	Sapindaceae
8	*Pongamia pinnata*	Fabaceae
9	*Peltophorum pterocarpum*	Fabaceae
10	*Lumnitzera littorea*	Combretaceae
11	*Terminalia catappa*	Combretaceee
12	*Syzygium claviflorum*	Myrtaceae
13	*Syzygium manii*	Myrtaceae
14	*Baringtonia racemosa*	Lecythidaceae
15	*Melstoma malabathricum*	Melastomaceae
16	*Mussaenda macrophylla*	Rubiaceae
17	*Mimusops elengi*	Sapotaceae
18	*Tabernaemontana crispa*	Apocynaceae
19	*Draceana* spp.	Draceanaceae
20	*Caryota mitis*	Arecaceae
21	*Pinanga kuhlii*	Arecaceae
22	*Areca triandra*	Arecaceae
23	*Cycas rumphii*	Cycadaceae
24	*Cyathea albosetacea`*	Cyatheaceae

Annexure - 16, Table-13

Species of Dipterocarpaceae proposed in conservatory at the Biological Park, Chidiyatapu	
S.No.	**Species**
1	Dipterocarpus costatus
2	Dipterocarpus alatus
3	Dipterocarpus incanus
4	Dipterocarpus griffithii
5	Dipterocarpus kerrii
6	Dipterocarpus turbinatus
7	Dipterocarpus pilosus
8	Dipterocarpus hasseltii

Annexure - 17, Table-14.

Ficus Species proposed in Bonsai section at the Biological Park, Chidiyatapu	
S.No.	**Species**
1	*Ficus peduncularis*
2	*Ficus affinis*
3	*Ficus. altissima*
4	*Ficus ampelas*
5	*Ficus andamanica*
6	*Ficus benjamina*
7	*Ficus brevicuspis*
8	*Ficus callosa*
9	*Ficus capillipes*

10	*Ficus chartacea*
11	*Ficus charysocarpa*
12	*Ficus costata*
13	*Ficus curtipes*
14	*Ficus elastica*
15	*Ficus fistulosa*
16	*Ficus fulva*
17	*Ficus glaberrima*
18	*Ficus hederacea*
19	*Ficus hispida*
20	*Ficus indica.*
21	*Ficus laevis*
22	*Ficus magnoleafolia*
23	*Ficus microcarpa*
24	*Ficus nervosa*
25	*Ficus racemosa*
26	*Ficus sagittata*
27	*Ficus retusa*
28	*Ficus rumphii*
29	*Ficus subulata*
30	*Ficus sundaica*
31	*Ficus tinctoria*
32	*Ficus variegata*
33	*Ficus virens*
34	*Ficus religiosa* ----Exotic
35	*Ficus benghalensis*-----Exotic

ANNEXURE – 18, Table -15

Present position of tranquilizing equipment:

S. No	Name of the equipment	Quantity	Remarks
1.	Dist – inject Rifle (Model –M 60)	1	In use
2.	Pneumatic blow pipe	1	In use
3	Mini eject blow pipe	1	Nil

ANNEXURE – 19, Table-16

Required tranquilizing equipment

SNo	Equipments	Quantity
1.	Rifle model 60	2
2	Blow pipe	2
	Accessories	
1	4ml alum. Barrel syringe	10
2	5ml alum barrel syringe	10
3	Rubber plunger	10
4	Needles with collar art.3040	10
5.	Stablizer art 3049	10
6	Art 2006 chargers for metal syringes	20
7	Art 2013 cartridge (yellow)	20
8	Cartridge brown	20
9	Miniejject 3ml	5
10	Mini eject 5ml	5
11	Wollen stabilizer art 3092	5
12	Needles art .3068	10
13	2 ml aluminum barrel for metal syringes	10
14	10 ml Aluminum Barrel for Metal Syringes Art .3030	10
15	Telescopes sight Art 4021	01

Drugs:

The following drugs are always required to meet any emergency situation inside or outside the Park.

ANNEXURE – 20, Table-17

Tranquilizing Drugs required

SNo	Name of the Drug	Quantity
1	Ketamine – 100	500 ml x2
2	Xylazine -100	500 ml x 2
3	Yohimbine hydrochloride	500ml x 2

Annexure - 21, Table- 18

Proposed staffing pattern of the Biological Park, Chidiyatapu				
SN	**Name of Post**	**Sanctioned**	**Existing**	**Proposed**
I	**Establishment**			
	Deputy Director (Deputy Conservator of Forests)	0	0	01
	Assistant Director (Assistant Conservator of Forests)	01	01	01
	Office Superintendent	0	0	01
	Head Clerk	01	01	01
	Higher Grade Clerk	01	00	02
	Lower Grade Clerk cum Computer Assistant	02	02	04
	Daftari	01	01	01
	Peon	01	01	02
	Dakman	01	01	01
	Skilled Assistants	0	0	04
	Watchman	01	02	02
II	**Security**			
	Deputy Ranger	02	02	01
	Forester	01	01	01

	Head Forest Guard	01	01	01
	Forest Guards	02	02	02
	Ticket Collector	0	0	02
III	**Park Management**			
	Curator(Assistant Conservator of Forest)	0	0	01
	Assistant Curator(Ranger)	01	01	01
	Forester	02	01	02
	Head Forest Guard	0	01	01
	Forest Guard	01	02	02
	Animal Keepers	0	0	04
	Animal Attendants	0	02	08
	Gardeners	0	0	02
	Multi-Skilled Assistants	30	30	30
IV	**Veterinary**			
	Junior Veterinary Officer	0	0	01
	Veterinary Compounder	0	0	01
	Lab Technician	0	0	01
	Lab Assistant/Veterinary Dresser	0	0	02
V	**Sanitation and waste disposal**			
	Forester	01	01	01
	Forest Guards	01	01	02
	Sweeper	0	01	04
VI	**Construction & Maintenance**			
	A. Buildings/Roads/Enclosures			
	Junior Engineer	0	0	01
	Supervisor (Forester)	0	0	01

	Draftsman	0	0	01
	Electrician	0	0	02
	Carpenter	0	0	03
	Mason	0	0	03
	Plumber	0	0	01
	Welder	0	0	01
	Painter/Artist	0	0	02
	Multi-Skilled Assistants	10	10	30
	B. Lawns and Gardens			
	Gardener	0	0	02
	C. Machineries/vehicles			
	Driver (HV)	0	01	01
	Driver(LV)	01	01	01
VII	**Procurement and Supply**			
	Assistant Store Keeper	0	0	01
	Cook cum Feed Maker	0	0	02
VIII	**Education & Technician**			
	Biologist	0	0	01
	Research/Education Assistant (Forests & Wildlife)	0	0	01
	Audio Video Operator/Projector Operator	0	0	01
	Guide	0	0	02
	Artists cum Modeler	0	0	01
	Junior Librarian	0	0	01
		62	**67**	**149**

ANNEXURE - 22 (TABLE -19)

Checklist of Free Ranging Birds in Chidiyatapu Biological Park

A- BIRDS

Table 1. List of bird species recorded from Chidiyatappu Biological Park

Sl. No.	Common Name	Scientific Name	Residential status	Conservation status
	Ciconiiformes			
	Ardeidae			
1.	Andaman Little Green Heron	*Butorides striatuss podiogaster*	R	NR
	Falconiformes			
	Accipitridae			
2.	Andaman Black-crested Baza	*Aviceda leuphotes andamanica*	R	LC
3.	Brahminy kite	*Haliastur Indus*	RM	LC
4.	White-bellied Sea-Eagle	*Haliaeetus leucogaster*	R	LC
5.	Andaman Serpent-Eagle	*Spilornis elgini*	R	NT
6.	Andaman Crested Serpent-Eagle	*Spilornis cheela davisoni*	R	LC
7.	Changeable Hawk-Eagle	*Spizaetus cirrhatus andamanensis*	R	LC
	Gruiformes			
	Rallidae			
8.	Andaman Crake	*Rallina canningi*	R	NT
9.	Andaman Blue-Breasted Rail	*Gallirallusstriatusobscurior*	R	LC
10.	Andaman White- breasted Waterhen	*Amaurornis phoenicurus nsularis*	R	LC
11.	Baillon's Crake	*Porzana pusilla*	R	LC
12.	Purple Moorhen	*Porphyrio porphyrio*	RM	LC
13.	Common Moorhen	*Gallinula chloropus*	RM	LC
	Charadriiformes			
	Charadriidae			
14.	Pacific Golden-Plover	*Pluvialisfulva*	WM	LC
	Scolopacidae			
15.	Whimbrel	*Numenius phaeopus*	WM	LC
16.	Common Sandpiper	*Actitis hypoleucos*	WM	LC
	Laridae			
17.	Black-naped Tern	*Sterna sumatrana*	R	LC
	Columbiformes			

	Columbidae			
18.	Blue Rock Pigeon	*Columba livia*	R	LC
19.	Andaman Wood-Pigeon	*Columba palumboides*	R	NT
20.	Red Collared-Dove	*Streptopelia tranquebarica*	R	LC
21.	Andaman Cuckoo-Dove	*Macropygia rufipennis*	R	NT
22.	Andaman Emerald dove	*Chalcophaps indica maxima*	R	LC
23.	Nicobar Pigeon	*Caloenas nicobarica*	R	LC
24.	Andaman Green-Pigeon	*Treron chloropterus*	R	NR
25.	Andaman Green-imperial Pigeon	*Duculaaenea andamanica*	R	LC
	Psittaciformes			
	Psittacidae			
26.	Indian Hanging-Parrot	*Loriculus vernalis*	R	LC
27.	Alexandrine parakeet	*Psittacula eupatria magnirostris*	R	LC
28.	Andaman Red-breasted Parakeet	*Psittacula alexandri abbotti*	R	LC
29.	Andaman Red-Cheeked Parakeet	*Psittacula longicauda tytleri*	R	NT
	Cuculiformes			
	Cuculidae			
30.	Indian Cuckoo	*Cuculus micropterus*	R	LC
31.	Oriental Cuckoo	*Cuculus saturates*	R/SM	LC
32.	Lesser Cuckoo	*Cuculus poliocephalus*	R/WM	LC
33.	Asian Emerald Cuckoo	*Chrysococcyx maculates*	R/WM	LC
34.	Violet Cuckoo	*Chrysococcyx xanthorhynchus*	R/LM	LC
35.	Andaman Koel	*Eudynamys scolopaceasoloa*	R	LC
36.	Andaman Coucal	*Centropus andamanensis*	R	LC
	Strigiformes			
	Strigidae			
37.	Andaman Scops-Owl	*Otus balli*	R	NT
38.	Oriental Scops-Owl	*Otus sunia*	R	LC
39.	Andaman Brown Hawk-Owl	*Ninox affinis affinis*	R	LC
40.	Andaman Hawk-Owl	*Ninox affinis*	R	NT
	Apodiformes			
	Apodidae			
41.	White bellied swiftlet	*Collocalia esculenta*	R	LC
42.	Brown-backed Needletail-Swift	*Hirundapus gigantius*	R	LC
	Coraciformes			

	Alcedinidae			
43.	Small Blue Kingfisher	*Alcedo atthis*	R/WM/SM	LC
44.	Andaman Blue-eared Kingfisher	*Alcedo meniantingrufigaster*	R	LC
45.	Oriental Dwarf Kingfisher	*Ceyx erithacus*	R/LM	LC
46.	Andaman Stork-billed Kingfisher	*Halcyon capensisosmastoni*	R	LC
47.	Andaman Ruddy Kingfisher	*Halcyon coromandamizorhina*	R	LC
48.	Andaman White-breasted Kingfisher	*Halcyon smyrnensis saturatior*	R	LC
49.	Black-capped Kingfisher	*Halcyon pileata*	R	LC
50.	Andaman Collared Kingfisher	*Halcyon chloris davisoni*	R	LC
	Meropidae			
51.	Blue-tailed Bee-eater	*Merops philippinus*	R/SM	LC
52.	Andaman Chestnut-headed Bee-eater	*Merops leschenaultia andamanensis*	R	LC
	Piciformes			
	Picidae			
53.	Andaman Fulvous-breasted Pied Woodpecker	*Dendrocopos macei andamanensis*	R	LC
54.	Andaman Black Woodpecker	*Dryocopus hodgei*	R	NT
	Passeriformes			
	Hirundinidae			
55.	House Swallow	*Hirundo tahitica*	R	LC
	Motacillidae			
56.	Forest Wagtail	*Dendronanthus indicus*	R/WM	LC
57.	Yellow Wagtail	*Motacilla flava*	R/WM/PM	LC
58.	Grey Wagtail	*Motacilla cinerea*	R/WM/AM	LC
	Campephagidae			
59.	Large Cuckoo- Shrike	*Coracina maceiandmanus*	R	LC
60.	Andaman Cuckoo-Shrike	*Coracina striata dobsoni*	R	LC
61.	Ashy Minivet	*Pericrocotus divaricatus*	V	LC
62.	Small Minivet	*Pericrocotus cinnamomeus*	R	LC
63.	Andaman Scarlet Minivet	*Pericrocotus flammeus andamanensis*	R	LC
	Pycnonotidae			
64.	Andaman Bulbul	*Pycnonotus atriceps fuscoflavescens*	R	LC
65.	Andaman Red-whiskered Bulbul	*Pycnonotus jocosuswhistleri*	R	LC
	Irenidae			
66.	Asian Fairy-Bluebird	*Irena puella*	R	LC

	Lanidae			
67.	Brown Shrike	*Lanius cristatus*	WM	LC
68.	Andaman Orange-headed Thrush	*Zoothera citrine andamanensis*	R	LC
69.	Oriental Magpie-Robin	*Copsychus saularis*	R	LC
70.	Andaman Shama	*Copsychus malabaricus albiventris*	R	LC
71.	Andaman Palefooted Bush-Warbler	*Cettiapallidipesosmastoni*	R	LC
72.	Thick-billed Warbler	*Acrocephalus aedon*	WM	LC
73.	Large-billed Leaf-Warbler	*Phylloscopus magnirostris*	WM	LC
74.	Dusky Warbler	*Phylloscopus fuscatus*	WM	LC
	Muscicapinae			
75.	Asian Brown flycatcher	*Muscicapa dauurica*	R/WM	LC
76.	Red-throated Flycatcher	*Ficedula parva*	WM	LC
77.	Tickell's Blue Flycatcher	*Cyornis tickelliae*	R	LC
	Monarchinae			
78.	Andaman Black-naped Monarch-Flycatcher	*Hypothymis azurea*	R	LC
	Pachycephalinae			
79.	Mangrove Whistler	*Pacycephala grisola*	R	LC
	Dicaeidae			
80.	Andaman Flowerpecker	*Dicaeum concolor virescens*	R	LC
	Nectariniidae			
81.	Andaman Olive-backed Sunbird	*Nectarinia jugularis andamanica*	R	LC
	Zosteropidae			
82.	Oriental White-eye	*Zosterops palpebrosus*	R	LC
	Estrildidae			
83.	Andaman White-rumped Munia	*Loncghura striata fumigate*	R	LC
	Passerinae			
84.	House Sparrow	*Passer domesticus*	R	LC
	Sturnidae			
85.	Andaman Glossy starling	*Aplonis panayensis* tytleri	R/LM	LC
86.	White-headed Starling	*Sturnus erythropygius*	R	LC
87.	Common Myna	*Acridotheres tristis*	R	LC
88.	Andaman Hill Myna	*Gracula religiosa andamanensis*	R	LC
	Oriolidae			
89.	Eurasian Golden Oriole	*Oriolus oriolus*	R/WM	LC

90.	Andaman Black-naped oriole	*Oriolus chinensis andamansis*	R	LC
91.	Black-headed Oriole	*Oriolus xanthornus*	R	LC
	Dicruridae			
92.	Crow-billed Drongo	*Dicrurus annectans*	R	LC
93.	Large Andaman Drongo	*Dicrurus andamanensis dicruriformes*	R	LC
94.	Small Andaman Drongo	*Dicrurus andamanensis andamanensis*	R	LC
95.	Andaman Racket-tailed Drongo	*Dicrurus paradiseus otiosus*	R	LC
	Corvidae			
96.	Andaman Treepie	*Dendrocitta bayleyi*	R	NT
97.	Jungle crow	*Corvus macrothynchos*	R	LC

Migratory Status: R - Resident; RM - Resident with local movements; WM - Winter migrants; R/WM - Resident with winter influx as well as altitudinal movements;
Conservation status: NT - Near Threatened; LC - Least Concern; NR - Not assessed

Endemic and threatened bird species

Table 2. Endemic species of birds recorded from Chidiyatapu

Sl. No.	***Endemic bird species***
1.	Andaman Serpent-Eagle *Spilornis elgini*
2.	Andaman Crake *Rallina canningi*
3.	Andaman Wood-Pigeon *Columba palumboides*
4.	Andaman Cuckoo-Dove *Macropygia rufipennis*
5.	Nicobar Pigeon *Caloenas nicobarica*
6.	Andaman Green-Pigeon *Treron chloropterus*
7.	Andaman Koel *Eudynamys scolopaceasoloa*
8.	Andaman Coucal *Centropus andamanensis*
9.	Andaman Scops-Owl *Otus balli*
10.	Andaman black Woodpecker *Dryocopus hodgei*
11.	Andaman Cuckoo-Shrike *Coracina dobsoni*
12.	Andaman Black-naped Monarch-Flycatcher *Hypothymis azurea*
13.	Andaman Glossy starling *Aplonis panayensis*
14.	Andaman White-headed Starling *Sturnus erythropygius*
15.	Andaman Treepie *Dendrocitta bayleyi*
16.	Andaman Hawk-Owl *Ninox affinis*
	Endemic bird species at sub-species level
17.	Andaman Little green Heron *Butorides striatuss podiogaster*
18.	Andaman Black-crested Baza *Aviceda leuphotes andamanica*
19.	Changeable Hawk-Eagle *Spizaetus cirrhatus andamanensis*
20.	Andaman Blue-Breasted Rail *Gallirallus striatus obscurior*
21.	Andaman White- breasted Waterhen *Amaurornis phoenicurus*
22.	Andaman Emerald dove *Chalcophaps indica maxima*
23.	Andaman Green-imperial Pigeon *Ducula aenea andamanica*
24.	Andaman Alexandrine parakeet *Psittacula eupatria magnirostris*
25.	Andaman Red-breasted Parakeet *Psittacula alexandri abbotti*

26. Andaman Red-Cheeked Parakeet *Psittacula longicauda tytleri*
27. Andaman Brown Hawk-Owl *Ninox affinis affinis*
28. Andaman Nightjar *Caprimulgus macrurus andamanicus*
29. Andaman Blue-eared Kingfisher *Alcedo meniantingrufigaster*
30. Andaman Stork-billed Kingfisher *Halcyon capensis osmastoni*
31. Andaman Ruddy Kingfisher *Halcyon coromanda mizorhina*
32. Andaman White-breasted Kingfisher *Halcyon smyrnensis saturatior*
33. Andaman Collared Kingfisher *Halcyon chloris davisoni*
34. Andaman Chestnut-headed Bee-eater *Merops leschenaultia*
35. Andaman Fulvous-breasted Pied Woodpecker *Dendrocopos macei*
36. Andaman Scarlet Minivet *Pericrocotus flammeus andamanensis*
37. Andaman Bulbul *Pycnonotus atriceps fuscoflavescens*
38. Andaman Red-whiskered Bulbul *Pycnonotus jocosus whistleri*
39. Andaman Orange-headed Thrush *Zoothera citrine andamanensis*
40. Andaman Oriental Magpie-Robin *Copsychus saularis andamanensis*
41. Andaman Shama *Copsychus malabaricus albiventris*
42. Andaman Palefooted Bush-Warbler *Cettia pallidipes osmastoni*
43. Andaman Flowerpecker *Dicaeum concolor virescens*
44. Andaman Olive backed sunbird *Nectarinia jugularis andamanica*
45. Andaman White rumped Munia *Loncghura striata fumigate*
46. Andaman Hill Myna *Gracula religiosa andamanensis*
47. Andaman Black-naped oriole *Oriolus chinensis andamansis*
48. Large Andaman Drongo *Dicrurus andamanensis dicruriformes*
49. Small Andaman Drongo *Dicrurus andamanensis andamanensis*
50. Andaman Racket tailed drongo *Dicrurus paradiseus otiosus*

Free ranging fauna of the Biological Park, Chidiyatapu (other than birds)

AMPHIBIANS, REPTILES AND MAMMALS

Table 3. List of Amphibians, Reptiles and Mammals

Sl. No.	Common Name	Scientific name
		AMPHIBIANS
		Bufonidae
1.	Common Indian Toad	*Bufo melanostictus* (Schneider, 1799)
		Microhylidae
2.	Muller's Narrowmouth Toad	*Kaloula baleata ghoshi*
		Dicroglossidae
3.	Andaman wart frog	*Fejervarya andamanensis*
4.	Andaman Wart Frog	*Fejervarya andamanensis* Stoliczka, 1870
5.	Indian Bull Frog	*Hoplobatrachus tigerinus*
		REPTILES
		Agamidae
6.	Bay Islands Forest Lizard	*Coryphophylax subcristatus* (Blyth, 1860)
7.	Short-tailed Bay Island forest lizard	*Coryphophylax brevicaudus*
8.	Common Garden lizard	*Calotes versicolor*
		Geckkonidae
9.	Andaman Day Gecko	*Phelsuma andamanense* Blyth, 1860
10.	Andaman Rock Gecko	*Cnemaspis andersoni*
11.	Red Bow-fingered Gecko	*Cyrtodactylus rubidus* (Blyth, 1860)
12.	Andaman Giant Gecko	*Gekko verreauxi* Tytler, 1865
13.	Andaman House Gecko	*Hemidactylus frenatus*
14.	Brook's House Gecko	*Hemidactylus brookii*
		Scincidae
15.	Andaman Islands grass skink	*Eutropis andamanensis (Smith, 1935)*
		Varanidae
16.	Water Monitor	*Varanus salvator*
		Typhlopidae
17.	Andaman Blind Snake	*Indotyphlops braminus*
18.	Andaman Worm Snake	*Typhlops andamanensis Stoliczka, 1871*
19.	Andaman Island Worm Snake	*Asiatyphlops oatesii*
		Colubridae
20.	Andaman Wolf Snake	*Lycodon hypsirhinoides*
21.	Andaman Bronze Back	*Dendrelaphis andamanensis (Anderson, 1871)*
22.	Andaman Rat Snake	*Ptyas mucosa*
23.	Andaman Cat Snake	*Boiga andamanensis*
24.	Dog-faced water Snake	*Cerberus rynchops*
		Natricidae
25.	Tytler'sKeelback	*Xenochrophis tytleri*
		Elapidae
26.	Andaman's Krait	*Bungarus andamanensis* Biswas and Sanyal, 1978
27.	Andaman Cobra	*Naja sagittifera* Wall, 1913
	King Cobra	*Ophiophagus hannah*
		MAMMALS
		Soricidae
28.	Andaman Ground Shrew	*Soricomorpha andamanensis* Alfred , 2002
		Pteropodidae
29.	Lesser short-nosed fruit bat	*Cynopterus brachyotis* (Muller, 1838)

		Rhinolophidae	
30.	Andaman Horseshoe Bat	*Rhinolophus cognatus cognatus* Andersen, 1906	
		Pteropodidae	
31.	Andaman Flying Fox	*Pteropus melanotus tytleri*	
		Megadermatidae	
32.	Lesser False Vampire Bat	*Megaderma spasma*	
		Sciuridae	
33.	Northern Palm Squirrel	*Funambulus pennant*	
34.	Andaman House Rat	*Rattus rattus andamanensis* (Blyth)	

B- BUTTERFLIES

Table 4. List of Butterflies

Sl. No.	Family	Common Name	Scientific Name	Status
1.	**Hesperiidae**	Brown Awl	*Badamia exclamationis*	Not rare, locally common
2.		Giant Red Eye	*Gangara thyrsis*	Not rare
3.		Common Snow Flat	*Tagiades japetus*	Not rare
4.		Plain Banded Awl	*Hasora vitta*	Not common
5.	**Lycaenidae**	Grams Blue	*Euchrysops cnejus*	Common
6.		Common Cerulean	*Jamides celeno blairana*	Common
7.		Yamfly	*Loxura atymnus*	Common
8.		Dingy Blue	*Petrelaea dana*	Not rare
9.		Pale Grass Blue	*Pseudozizeeria maha*	Common
10.		Common Onyx	*Horaga onyx*	Locally common
11.		Quaker	*Neopithecops zalmora*	Common
12.	**Nymphalidae**	Andaman Palmking	*Amathusia Andamanensis*	Rare
13.		Leopard Lacewing	*Cethosia cyane*	Not rare
14.		Rustic	*Cupha erymanthis andamanica*	Common
15.		Andaman Map	*Cyrestis thyodamas andamanica*	Not common
16.		Autumn Leaf	*Doleschallia bisaltide*	Not rare
17.		Andaman Palmfly	*Elymnias cottonis*	Rare
18.		Andaman Crow	*Euploea Core Andamanensis*	Rare
19.		Pasha	*Herona marathus andamana*	Not rare
20.		Great Egg Fly	*Hypolimnas bolina jacintha*	Common
21.		Peacock Pansy	*Junonia almana*	Common
22.		Grey Pansy	*Junonia atlites*	Locally common

23.		Yellow Pansy	*Junonia hierta*	Common
24.		Commander	*Moduza procris*	Common
25.		Banded Bush Brown	*Mycalesis mineus*	Common
26.		Clear Sailor	*Neptis clina*	Rare
27.		Glassy Blue Tiger	*Parantica aglea*	Common
28.		Clipper	*Parthenos sylvia*	Rare
29.		Small Leopard	*Phalantha alcippe*	Locally common
30.		Cruiser	*Vindula erota*	Not rare
31.		White Commander	*parasarpa dudu*	Rare
32.	**Papilionidae**	Common Mime	*Chilasa clytia*	Not rare
33.		Tailed Jay	*Graphium agamemnon*	Common
34.		Common Jay	*Graphium doson*	Locally common
35.		Andaman Swordtail	*Graphium epaminondas*	Rare
36.		Common Lime	*Papilio demoleus*	Very common
37.		Andaman Mormon	*Papilio mayo*	Not rare
38.		Common Mormon	*Papilio polytes*	Very common
39.		Andaman Helen	*Papilio prexaspes andamanicus*	Rare
40.	**Pieridae**	Common Albatross	*Appias albina*	Common
41.		Common Emigrant	*Catopsilia pomona*	Common
42.		Lesser Gull	*Cepora nesissa lichenosa*	Locally common
43.		Three Spotted Grass Yellow	*Eurema blanda*	Common
44.		Common Grass Yellow	*Eurema hecabe*	Common
45.		Tree Yellow	*Gandaca harina andamana*	Not
46.		Great Orange Tip	*Hebomoia glaucippe*	Common
47.		Yellow Orange tip	*Ixias pyrene andamana*	Common
48.		Psyche	*Leptosia nina*	Common
49.		Common Wanderer	*Pareroni ceylanica naraka*	Common

ANNEXURE – 24, TABLE –21

Rare, Endangered and Threatened plants of A&N Islands

Family	Species	Remarks
MONOCOTS		
Araceae	*Amorphophallus carnosus*	Rare & Threatened
	Amorphophallus longistylus	Rare & Threatened
	Amorphophallus oncophyllus	Rare & Threatened
Arecaceae	*Calamus dilaceratus*	Rare & Threatened
	Corypha macropoda	Rare & Threatened
	Nypa fruticans	Critical
Cyperaceae	*Cyperus kurzii*	Rare & Threatened
	Hypolytrum balakrishnanii	Rare
Dioscoreaceae	*Dioscorea vexans*	Rare
	Dioscorea rogersii	Rare
Marantaceae	*Stachyphrynium cadellianum*	Rare & Threatened
Orchidaceae	*Bulbophyllum protractum*	Rare & Threatened
	Habenaria andamanica	Rare & Threatened
	Malleola andamanica	Rare & Threatened
	Phalaenopsis speciosa	Rare & Threatened
	Smitinandia helferi	Rare & Threatened
	Taeniophyllum andamanicum	Rare & Threatened
	Zeuxine rolfiana	Rare & Threatened
	Zeuxine andamanica	Rare & Threatened
Poaceae	*Oryza indandamanica*	Rare
Zingiberaceae	*Bosenbergia albo-lutea*	Rare

	Globba pauciflora	Rare
	Kaempferia siphonantha	Rare & Threatened
DICOTS		
Acanthaceae	*Hypoestis andamanensis*	Rare & Threatened
	Hypoestis thothathrii	Rare
	Strobilanthes andamanensis	Rare & Threatened
Anacardiaceae	*Mangifera andamanica*	Rare & Threatened
Annonaceae	*Orophaea torulosa*	Rare
Asteraceae	*Vernonia andamanica*	Rare & Threatened
Bombacaceae	*Bombax insigne*	Rare
Clusiaceae	*Garcinia cadelliana*	Rare
	Garcinia kingie	Rare
	Mesua manii	Rare
Euphorbiaceae	*Antidesma andamanicum*	Rare
	Bridelia kurzii	Rare
	Cnesmone javanica	Rare
	Dimorphocalyx balakrishnanii	Rare
	Dimorphocalyx dilipanus	Rare
	Glochidion bilobulatum	Rare
	Phyllanthus andamanica	Rare & Threatened
	Sphyranthera airy-shawii	Rare
	Sphyranthera lutescens	Rare
	Trigonostemon viridissimus	Rare & Threatened
Fabaceae	*Tadehagi triquetrum*	Rare & Threatened
Flacourtiaceae	*Casaeria insularis*	Rare
Hypocrataceae	*Hippocratea andamanica*	Rare

Icacinaceae	*Gomphandra comosa*	Rare
Lamiaceae	*Scutellaria andamanica*	Rare
Lauraceae	*Cryptocarya ferrarsii*	Rare
	Litsea kurzii	Rare
	Litsea leiantha	Rare
	Neolitsea andamanica	Rare
	Neolitsea balakrishnanii	Rare & Threatened
Loganiaceae	*Strychnos narcondamensis*	Rare
Loranthaceae	*Ginalloa andamanica*	Rare & Threatened
Malphigiaceae	*Hiptage thothathrii*	Rare & Threatened
Melastomataceae	*Memecylon collinum*	Rare
Meliaceae	*Aglaia fusca*	Rare
	Amoora manii	Rare
Menispermaceae	*Stephania andamanica*	Rare
	Tinospora andamanica	Rare
Moraceae	*Ficus andamanica*	Rare
Myristicaceae	*Horsfieldia macrocarpa*	Rare
Myrsinaceae	*Maesa andamancia*	Rare
Myrtaceae	*Syzygium andamanicum*	Rare
	Syzygium kurzii	Rare
	Syzygium manii	Rare
Oleaceae	*Jasminum andamanicum*	Rare
	Jasminum unifoliolatum	Rare
Rubiaceae	*Diplospora andamanica*	Rare & Threatened
	Ixora andamanica	Rare & Threatened
	Ixora capituliflora	Rare

	Ixora hymenophylla	Rare
	Nauclea gageana	Rare
	Prismatomeria andamanica	Rare
	Psychotria andamanica	Rare
	Psychotria balakrishnanii	Rare & Threatened
	Psychotria helferi	Rare
	Psychotria pendula	Rare
	Psychotria polyneura var. *longipetiolata*	Rare
	Pubistylis andamanensis	Rare & Threatened
Verbenaceae	*Clerodendrum lankawiense*	Rare
Vitaceae	*Tetrastigma andamanicum*	Rare

Source: Sreekumar- list. (2002); W C M C (1994) lists 365 as threatened.

ANNEXURE – 25, TABLE– 22

Endemic Plants of A&N Islands

SN	Family	*Scientific Name*
1.	Cyatheaceae	*Cyathea albosetacea*
2.		*Cyathea nicobarica*
3.	Ranunculaceae	*Clematis smilacifolia var. andamanica*
4.	Dilleniaceae	*Dillenia andamanica*
5.	Annonaceae	*Artobotrys nicobarianus*
6.		*Friesodielsia forniculata*
7.		*Orophea katschallica*
8.		*Polyalthea Parkinsonii*
9.		*Pseuduvaria prainii*
10.		*Uvaria nicobarica*
11.	Menispermaceae	*Cyclea pendulina*
12.	Sterculiaceae	*Sterculia cordata*
13.	Tiliaceae	*Grewia calophylla*
14.	Rutaceae	*Glyosmis pilosa*
15.		*G. mauritiana var. andamanensis*
16.		*Paramignya andamanica*
17.	Meliaceae	*Chisocheton nicobaricus*
18.		*Dysoxylum alliaceum*
19.	Icacinaceae	*Codiocarpus andamanica*
20.		*Gomphandra comosa*
21.	Celastraceae	*Nicobariodendron sleumeri*
22.	Vitaceae	*Tetrastigma andamanica*

23.		*Leea grandifolia*
24.	Anacardiaceae	*Mangifera nicobarica*
25.		*Semecarpus kurzii*
26.	Connaraceae	*Connarus nicobaricus*
27.	Combretaceae	*Terminalia procera*
28.	Melastomataceae	*Otanthera nicobarensis*
29.	Memecylaceae	*Memecylon andamanicum*
30.	Rubiaceae	*Coptophyllum nicobaricum*
31.		*Hedyotis paradoxa*
32.		*Ixora brunnescens*
33.		*I. cuneifolia var. macrocarpa*
34.		*I. grandifolia var. kurzlana*
35.		*I. grandifolia var. rosella*
36.		*I. tenuifolia*
37.		*Ophiorrhiza infundibularis*
38.		*0. nicobarica*
39.		*Psychotria andamanica*
40.		*P. platyneura*
41.		*Tarenna weberaefolia*
42.		*Emblica microcalyx*
43.	Myrsinaceae	*Maesa andamanica*
44.		*Jasminum multiflorum var.nicobaricum*
45.	Oleaceae	*Alstonia kurzii*
46.	Apocynaceae	*Chilocarpus denudatus var.nicobaricum*

47.		*Tabernaemontana crispa*
48.	Ascelpiadaceae	*Genianthus horei*
49.	Scrophulariaceae	*Cyrtandroemia nicobarica*
50.	Gesneriaceae	*Cyrtandra burttii*
51.		*C.occidentalis*
52.	Acanthaceae	*Strobilanthes glandulosus*
53.	Myristicaceae	*Knema andamanica spp andamanica*
54.	Lauraceae	*Litsea kurzii*
55.	Euphorbiaceae	*Nothophoebe nicobaricus*
56.		*Claoxylon rostratum*
57.		*Cleistanthus balakrish*
58.		*Drypetes bhattacharyae*
59.		*Glochidion calocarpw*
60.		*Macaranga nicobarica*
61.		*Mallotus oblongifolius var. rubriflorus*
62.		*Sphryranthera lutescen*
63.		*Trigonostemo villosus var.nicobaricus*
64.	Urticaceae	*Pellionia procridofolia*
65.		*Elatostema novorae*
66.	Orchidaceae	*Aerides emericii*
67.		*Anoectochilus nicobaricus*
68.		*Eria bractescensvar.kurzii*
69.		*Dendrobium shompenii*
70.		*Pomatcalpa andamanicum*
71.		*Phalaenopsis speciosa var.speciosa*
72.		*Trichoglottis quadricornuta*

73.		*Vanilla andamanica*
74.	Zingiberaceae	*Hornstedtia fenzlii*
75.	Marantaceae	*Phrynium paniculatum*
76.	Dioscoreaceae	*Dioscorea vexans*
77.	Agavaceae	*Dracaena brachyphylla*
78.	Arecaceae	*Calamus andamanicus*
79.		*C.dilaceratus*
80.		*C.pseudo-rivalis*
81.		*C.uniforms*
82.		*C.nicobaricus*
83.		*Pinanga manii*
84.		*Rhopaloblaste augustata*
85.	Pandanaceae	*Pandanus leram var.andamanensium*
86.		*Aglaonema nicobaricum*
87.	Araceae	*Homalomena griffithii var.ovata*

ANNEXURE – 26, TABLE 23

Important Orchid species of A&N Islands

1.Aerides emercii	*2. A.multiflorum*
3. A.odoratum	*4.A.radiocosum*
5.Appendicula reflexa	*6.Aswcocentrum ampullaceum*
7.Bulbophyllum crassipes	*8. B.lepidum*
9.B.lilacinum	*10. B. macranthum*
11.B.protractrum	*12. B. pumilo*
13. B.rufinum	*14. B.sessile*
15. Ceratostylis subulata	*16. C.uraiensis*
17. Coelogyne thailandica	*18. Cymbidium aloifolium*
19. C.bicolor	*20. C.pubecens*
21. C.simulans	*22. Dendrobium anceps*
23. D.aphyllum	*24. D.crumenatum*
25. D.formosum	*26. D.grande*
27. D.indragiriensis	*28. D.pensile*
29. D. secundum	*30. D.tenuicaule*
31. D. tortile	*32. Diploprora championii*
33. Eria andamanica	*34. Eria bractescens*
35. Flickengeria fimbriata	*36. Luisia indivisca*
37. L.teretifolia	*38. L. zollingeri*
39. Oberonia iridiflora	*40. Papiolanthe teres*
41. Phalaenopsis cornu-cervi	*42. C.speciosa*
43. Pholidota imbricate	*44. P. pallida*
45. Podochilus microphyllus	*46. Pomatocalpa andamanicum*

47. P. wendlandorum	*48. Porpax meirax*
49. Pteroceras alatum	*50. P. appendiculatum*
51.P.berkrleyi	*52. P. muriculatus*
53. Rhynchostylis retusa	*54. Smitinandia helferi*
55. Taeniophyllum andamanicum	*56. T.filiforme*
57. Thelasis pygmaea	*58. Thrixspermum album*
59. T.amplrxicaule	*60. T. hystrix*
61. Trichoglottis cirrhifera	*62. T. orchidea*

ANNEXURE – 27, TABLE - 24

Important Pteridophytes of A&N Islands

1.Antrophyum callifolium	*2. A. parvulum*
3.A. reticulatum	*4. Asplenium adiantoide*
5. A.nidus	*6. A.nitidum*
7.A.sublaserpitifolium	*8.A.tenerum*
9.Davallia denticulate	*10. D. solida*
11.Humata heterophylla	*12.H. pectinata*
13.H.repens	*14 Dryneria quercifolia*
15. Cephalomanes javanicum	*16. Crepidiomanes bilabiatum*
17C. latealatum	*18 Didymoglossum hymenoides*
19 Microgonyum motleyi	*20 Reediella humilis*
21.Vandenboschia maxima	*22 Lindsaea parasitica*
23 L. rutlandia	*24 L. tetragona*
25 Lycopodium nummulariaefolium	*26 L. phlegmaria*
27 Nephrolepis biserrata	*28 Ophioderma pendula*
29 Colystis macrophylla	*30 C. sellignea*
31 Drymoglossumpilloselloides	*32 Leptochile saxillaris*
33 Microsorium insigne	*34 M. punctatum*
35 Pyrrosia adnascens	*36 P. longifolia*
37 Vittaria elongate	*38 V.ensiformis*

ANNEXURE – 28, TABLE - 25

Palms of A & N Islands
Canes (Rattans)

Calamus Sps	
1. Calamus andamanicus	*2. C.longisetus*
3.C.baratangensis	*4.C. viminalis*
5. C. palustris	*6 C. semi erectus*
7.C. nicobaricus	*8. C. unifarius*
9. C.dilaceratus	*10.C.basui*
11.C. pseudorivalis	
Daemonorops sps	
12.Daemonorops aureus	*13.D.manii*
14.D.kurzianus	*15 D. rarispinosus*
16.D wrightmyoensis	
Korthalsia Sps	
17. Korthalsia laciniosa	*18. Korthalsia rogersii*

Erect Palms

1. *Areca triandra*	2. *Pinanga kuhlii*
3. *Pinanga manii*	4. *P. andamanica*
5. *Bentickia nicobarica*	6. *Caryota mitis*
7. *Corypha macropoda*	8. *Rhopaloblaste ungusta*
Littoral & Swamp species	
9. *Licula peltata*	10 *L. spinosa*
11 *Phoenix palludosa*	12 *P. andamanica*
13 *Nypa fruticans*	

ANNEXURE – 29, TABLE –26

Aroides, Zingibers and Marantaceae members

Aracaceae	
1.*Amorphophallus longistylus*	2. *A. carnosus*
3. *A.oncophyllus*	4. *A. companulatus*
5. *Araesema saddlepekensis*	
Zingiberaceae	
6. *Alpinia manii*	7. *A. phoenicea*
8. *Amomum aculleatum* 10. *A.maximum*	9. *A. fenzlii* 11. *Boesenbergia rotunda*
12. *Costus speciosus*	13. *Curcuma mangga*
14. *C. petiolata*	15. *C.zeodaria*
16. *Globba marantina*	17. *G. pauci flora*
18. *G. versicolor*	19. *Kaempferia siphonantha*
20. *Zingiber aromaticum*	21. *Z.officinale*
22. *Z. spectabile*	23. *Z. squarrosum*
24. *Z. zerumbet*	
Marantaceae	
25. *Donax cannaeformis*	26. *Phrynium capitatum*
27. *P.paniculatum*	28. *P. pubinerve*
29. *Stachyphrynium cadellianum*	

ANNEXURE – 30, TABLE –27

Mangrove species of A & N Islands

1.Acanthus ilicifolius	*2.A.ebracteatu*
3.A. volubilis	*4.Aegitalis rotundifolia*
5.Aegiceras corniculatum	*6.Avicennia alba*
7. A. marina	*8. A.officinalis*
9. Bruguiera cylindrica	*10. B.gymnorrhiza*
11. B.sexangula	*12. B.parviflora*
13. Ceriops tagal	*14. Ceriops decandra*
15.Cynomitra iripa	*16. C.ramiflora*
17.Excoecaria agallocha	*18 Heritiera littoralis*
19.Kandelia candel	*20. Lumnitzera littorea*
21. L.racemosa	*22.Nypa fruticans*
23.Phoenix paludosa	*24. Rhizophora apiculata*
25 R. mucronata	*26. R. stylosa*
27. R. lamarckii	*28. Schyphiphora hydrophyllacea*
29. Sonneratia alba	*30. S. apetala*
31. S.caseolaris	*32. S.griffithii*
33. Xylocarpusgranatum	*34.X.mekongensis*
35.X.moluccensis	

ANNEXURE – 31, TABLE -28

Littoral and Swamp Species of A & N Islands

1. Dolichandrone spathacea	*2. Brownlowea tersa*
3. Cerbera manghas	*4. C. odollum*
5. Barringtonia racemosa	*6. Hibiscus tiliaceous*
7. Ardisia solanacea	*8. Clerodendrone inerme*
9.Pongamia pinnata	*10. Thespesia populnea*
11. Pandanus odoratissimus	*12. Calophyllum inophyllum*
13. Dendrolobium umbellatum	*14. Intsia bijuga*

ANNEXURE – 32, TABLE –29

Important Ornamental Plants of A & N Islands

SN	Scientific Name	Common Name	Family	Remark
1	*Crateva religiosa*		Capparidaceae	Medium sized tree with yellow flowers. Occurs at Nicobar Islands.
2	*Xanthophyllum andamanicum*		Xanthophyllaceae	A small densely foliated evergreen tree found in the semi-evergreen patch.
3	*Thespesia populnea*		Malvaceae	Fast growing evergreen littoral species.
4	*Podocarpus nerifolia*		Podocarpaceae	Medium sized tree with dark green leaves & drooping branches.
5	*Murraya paniculata*		Rutaceae	Small evergreen tree.
6	*Paramignya andamanica*		Rutaceae	Small evergreen endemic tree
7	*Nephelium longana*		Sapindaceae	Medium sized evergreen tree. New leaves appear red.
8	*Pongamia pinnata*		Fabaceae	A medium sized tree
9	*Peltophorum pterocarpum*		Fabaceae	A medium/large sized tree with attractive golden yellow flowers
10	*Lumnitzera littorea*		Combretaceae	A small littoral tree with scarlet red flowers
11	*Terminalia catappa*		Combretaceee	A medium/large sized tree with horizontal branching

12	*Syzygium claviflorum*		Myrtaceae	Small evergreen tree with round crown
13	*Syzygium manii*		Myrtaceae	Small evergreen tree with round crown
14	*Baringtonia racemosa*		Lecythidaceae	Small littoral tree
15	*Melstoma malabathricum*		Melastomaceae	A small shrub with pink flowers good for hedges
16	*Mussaenda macrophylla*		Rubiaceae	Small evergreen tree with attractive flower
17	*Mimusops elengi*		Sapotaceae	A medium/large sized evergreen tree with white small fragrant flowers.
18	*Tabernaemontana crispa*		Apocynaceae	A small tree/shrub with white flower
19	*Draceana* spp.		Draceanaceae	A small tree with palm like stem and long leaves.
20	*Caryota mitis*	Madip athi	Arecaceae	A small palm with drooping branch of fruits.
21	*Pinanga kuhlii*	Kumba	Arecaceae	A small palm with fruits born on a red peduncle.
22	*Areca triandra*		Arecaceae	A small climbing palm with orange colored fruits.
23	*Cycas rumphii*	Arguna	Cycadaceae	Small palm (Gymnosperm)
24	*Cyathea albosetacea*	`	Cyatheaceae	An evergreen fern of Nicobar group of Islands.

ANNEXURE – 33, TABLE –30

Indigenous species of plants to be planted in the Biological Park

SN	Scientific Name	Common Name	Family
1	*Sagarea elliptica*	Chooi	Annonaceae
2	*Xanthophyllum andamanica*	Lephew	Xanthophyllaceae
3	*Calophyllum inophyllum*	Poon	Clusiaceae
4	*Garcinia andamanica*	Cowa	Clusiaceae
5	*Mesua ferrea*	Iron wood	Clusiaceae
6	*Dipterocarpus griffithi*	Gurjan	Dipterocarpaceae
	Dipterocarpus incanus	Gurjan	Dipterocarpaceae
	Dipterocarpus turbinatus	Gurjan	Dipterocarpaceae
7	*Hopea sp.*		Dipterocarpaceae
8	*Thespesia populnea*		Malvaceae
9	*Sterculia villosa*	Chilka	Sterculiaceae
10	*Grewia calophylla*	Mariyam	Tiliaceae
11	*Elaeocarpus aristatus*	Bhadrash	Elaeocarpaceae
	Elaeocarpus floibundus		Elaeocarpaceae
12	*Ailanthus triphysa*		Simarubaceae
13	*Canarium sp*		Burseraceae
14	*Nephelium longana*	Jungli Kusum	Sapindaceae
15	*Pometia pinnata*	Thitkandu	Sapindaceae
16	*Semicarpus kurzii*	Jungli Kaju	Anacardiaceae
17	*Erythrina variegata*		Fabaceae
18	*Pongamia pinnata*	Karanju	Fabaceae
19	*Terminalia catappa*	Badam	Combretaceae
20	*Alstonia scholaris*	Chaitun	Apocynaceae
21	*Lagerstroemia hypoleuca*	Pyinma	Lythraceae
22	*Duabanga sp*		
23	*Heterogyna rotundifolia*		
24	*Mussaenda macrophylla*		Rubiaceae
25	*Diploknema butyracea*	Hill Mohwa	Sapotaceae
26	*Diospyros marmorata*	Marble Wood	Diospyraceae
	Diopyros montana		Diospyraceae

27	*Cerbera manghas*		Apocynaceae
28	*Dolichandrone spathacea*		Bignoniaceae
29	*Hernandia peltata*		Hernandiaceae
30	*Bischofia javanica*	Ye-padauk	Euphorbiaceae
31	*Macaranga sp.*		Euphorbiaceae
32	*Mallotus sp.*		Euphorbiaceae
33	*Ficus nervosa*		Moraceae
34	*Draceana sp*		Dracenaceae
35	*Areca triandra*	Jungli supari	Arecaceae
36	*Pinanga sp*		Arecaceae
37	*Caryota mitis*	Mari pathi	Arecaceae
38	*Bentickia nicobarica*		Arecaceae
39	*Pandanus* spp.		Pandanaceae
40	*Dillenia pentagyna*		Dilleniaceae
41	*Magnolia andamanica*		Magnoliaceae
42	*Polyalthia Parkinsoni*		Annonaceae
43	*Orophaea katchalica*		Annonaceae
44	*Acronychia lauriolia*		Rutaceae
45	*Amoora wallichi*	Lal Chini	Meliaceae
46	*Podocarpus nerifolia*	Thitmin	Podocarpaceae
47	*Spondias pinnata*	Ambara	Anacardiaceae
48	*Hunteria zeylanica*		Apocynaceae
49	*Antidesma acideum*		Euphorbiaceae

ANNEXURE - 34 (TABLE -31)

Staffing Pattern of Biological Park, Biological Park Chidiyatapu

S.N	Name of Post	Sanctioned	Existing	Proposed
I	**Establishment**			
	Deputy Director (Deputy Conservator of Forests)	0	0	01
	Assistant Director (Assistant Conservator of Forests)	01	01	01
	Office Superintendent	0	0	01
	Head Clerk	01	01	01
	Higher Grade Clerk	01	00	02
	Lower Grade Clerk cum Computer Assistant	02	02	04
	Daftari	01	01	01
	Peon	01	01	02
	Dakman	01	01	01
	Skilled Assistants	0	0	04
	Watchman	01	02	02
II	**Security**			
	Deputy Ranger	02	02	01
	Forester	01	01	01
	Head Forest Guard	01	01	01
	Forest Guards	02	02	02
	Ticket Collector	0	00	02
III	**Park Management**			
	Curator(Assistant Conservator of Forest)	0	0	01

	Assistant Curator(Ranger)	01	01	01
	Forester	02	01	02
	Head Forest Guard	0	01	01
	Forest Guard	01	02	02
	Animal Keepers	0	0	04
	Animal Attendants	0	02	08
	Gardeners	0	0	02
	Multi-Skilled Assistants	30	30	30
IV	**Veterinary**			
	Junior Veterinary Officer	0	0	01
	Veterinary Compounder	0	0	01
	Lab Technician	0	0	01
	Lab Assistant/Veterinary Dresser	0	0	02
V	**Sanitation and waste disposal**			
	Forester	01	01	01
	Forest Guards	01	01	02
	Sweeper		01	04
VI	**Construction & Maintenance**			
	A. Buildings/Roads/Enclosures			
	Junior Engineer	0	0	01
	Supervisor (Forester)	0	0	01
	Draftsman	0	0	01
	Electrician	0	0	02
	Carpenter	0	0	03
	Mason	0	0	03
	Plumber	0	0	01

	Welder	0	0	01
	Painter/Artist	0	0	02
	Multi-Skilled Assistants	10	10	30
	B. Lawns and Gardens			
	Gardener	0	0	02
	C. Machineries/vehicles			
	Driver (HV)	0	01	01
	Driver(LV)	01	01	01
VII	**Procurement and Supply**			
	Assistant Store Keeper	0	0	01
	Cook cum Feed Maker	0	0	02
VIII	**Education & Technician**			
	Biologist	0	0	01
	Research/Education Assistant (Forests & Wildlife)	0	0	01
	Audio Video Operator/Projector Operator	0	0	01
	Guide	0	0	02
	Artists cum Modeler	0	0	01
	Junior Librarian	0	0	01

Annexure – 35, Table - 32

List of Buildings other than the enclosures for animals

S.No.	Name of the Buildings	No.
1.	Deputy Director's Office	1
2.	Store Godown	1
3.	Public Toilet	3
4.	Vanssthali (Forest Rest House)	1
5.	Cafeteria	1
6.	Veterinary Hospital	1
7.	Inpatient Ward	1
8..	Feed Preparation Room	1
9.	Orchid House	1
10.	Gift Shop	1
11.	Staff Quarters	15
12.	Labour Quarters	24
13	Ticket Counter, Emergency and First Aid Room, Entrance Gate & Reception	1
14	Dormitory	1
15	Watch Tower	2
16	Rest Huts	3
17.	Water Pump House	2

ANNEXURE – 36, TABLE -33

Items of works undertaken for the development of the Biological Park, Chidiyatapu as per the IXth, Xth & XIth Five Year Plan (1997-2002, 2002-07, 2007-2012 & 2012-2016)

(Amount – in Rupees)

S. No.	Item of Works	Year of Work	Sanctioned Amount	Amount Released by Plan	Amount Released by CZA
1	**Construction of Cages/Enclosures**				
1.	Enclosure for Spotted Deer	1998-99	9,47,420	9,47,420	-
2.	Enclosure for Hog Deer	2000-01	11,74,370	-	13,01,000
3.	Enclosure for Barking Deer	2000-01	9,52,220	-	10,25,000
4.	Enclosure for Sambhar Deer (Modified to Plant Section)	2000-01	15,72,552	-	15,73,000
5.	Enclosure for Andaman Wild Pig	2000-01	7,15,618	-	7,75,000
6.	Construction of Sea Turtle Enclosure (Modified to Crocodile enclosure)	2002-03	64,30,280	-	72,00,000
7.	Construction of Water Monitor Lizard Enclosure	2002-03	8,94,000	-	8,94,000
8.	Construction of Crocodile Enclosure with breeding Unit	2003-04	33,61,961	-	37,65,000
9.	Monkey enclosure	2005-06	47,76,000		
10.	Enclosure for Crab Eating Macaque	2007-08	47,48,000	-	48,78,000

11.	Construction of three Terrestrial Bird enclosures	2012-13	46,08,642	46,08,642		
12.	Construction of Andaman Serpent Eagle	2013-14	27,43,440	27,43,440		
13.	Construction of White Bellied Sea Eagle	2013-14	27,43,440	-	27,43,440	
	Total		**3,29,24,503**	**82,99,502**	**2,41,54,440**	
II.	**Other Constructions**					
A	Construction of Boundary Wall along the periphery of the Biological Park	P-I 600 mtr long 3m high)	1999-00	24,69,164	24,69,164	-
		P-II (600 mtr)	2002-03	25,52,038	52,038	-
		P-III (875 mtr)	2003-04	56,30,000	28,15,000	-
		P-IV (540 mtr)	2001-02	18,83,824	8,80,000	-
		P-IV (400 mtr) damaged wall	2006-07	17,30,109	17,30,109	-
B	Development of Children's Park	Providing & fixing of Playing tools	2005-06	1,73,83	1,73,836	-
		Laying of Footpath tiles, Fabricated grill railing & Arch Gate	2006-07	2,87,465	2,87,465	-
C	**Construction of Buildings**					
1	Construction of Store Go down		2003-04	10,06,056	10,06,056	-

2	Construction of Ticket Booth		2002-03	1,63,978	1,63,978	-
3	Construction of	a)Resting Shed (1 No)	2004-05	1,69,696	1,69,696	-
4		b)Cafeteria	2006-07	4,63,772	4,63,772	-
5	i)Construction of Deputy Director's Office		2000-01	34,21,136	34,21,136	
6	ii) Construction of Veterinary Hospital		2003-04	14,27,236	14,27,236	15,87,000 & 78,000
7	b) Type IV (1no)		2002-03	9,59,560	9,59,560	-
8	c) Type III (2 no)	Qrt No 1	1999-00	4,98,941	4,98,941	-
		Qrt No 2	2004-05	10,66,922	10,66,922	-
9	d) Type II (10 Nos/5 Twin sets)	Twin Set -1 (2 qrts)	2002-03	7,66,319	7,66,319	-
		Twin Set-2 (2 qrts)	2004-05	11,10,619	11,10,619	-
10		Twin Set-3 (2 qrts)	2006-07	11,89,066	11,89,066	--
11	e) Type I (20 Nos/10 Twin sets)	Twin Set -1(2qrts)	2003-04	8,61,838	8,61,838	-
		Twin Set-2 (2qrts)	2004-05	9,20,319	9,20,319	-
		Twin Set-3	2006-07	9,55,810	9,55,810	--
12	f) Labour Barrack (30 Nos/	Twin Set -1 (2 qrts)	1999-00	3,75,941 (x 3) =11,27,823	3,75,941 (x 3) =11,27,8	-
		Twin Set -2 (2 qrts)				

	10 Triplet sets)	Twin Set -3 (2 qrts)			23	
		Twin Set -4 (2 qrts)	2003-04	5,63,944 (x 3) =16,91,832	5,63,944 (x 3) =16,91,832	-
		Twin Set -5 (2 qrts)				
		Twin Set -6 (2 qrts)				
		4 family Set(4 qrts)	2006-07	10,00,145	10,00,145	-
	Construction of entrance gate		2007	14,78,748		
	Construction of Inpatient Ward		2013-14	13,87,561	13,87,561	
					2859624 1	**166500 0**
B	**Construction of Roads**					
1	Construction of 2Km W.B.M road within the Biological Park along the Enclosure	2002-03	80,13,600	80,13,600		-
ii	Construction of 1Km W.B.M road from entrance to Residential complex	1999-00	15,64,170	15,64,170		-
iii)	Construction of Parking Space	2003-04	7,92,254	7,92,254		-
iv	Construction of 200 mtr Black topped approach road	2002-03	2,99,040	2,99,040		-
v)	Improvement of 1 km road from Main road to Park entrance and to Residential complex	2003-04	19,59,000	19,59,000		-

C	**Water Supply**				
1.	Construction of Check weir	1999-00	12,35,854	2,35,854	10,00,000
2.	Procurement of Water Tanker	2000-01	7,23,976	7,23,976	-
3.	Construction of Sub-weir, in- take well, pump house and surface Tank	2002-03	13,05,000	3,05,000	10,00,000
4	.Laying of Pipe lines for water supply	2006-07	8,75,000	8,75,000	-
	Total			**1,47,67,894**	**20,00,000**

ABSTRACT

ANNEXURE – 37, Table 34

Items of works	***CZA share***	***Plan share***
Construction of cages/enclosures	2,41,54,440	82,99,502
Infrastructure development	16,65,000	2,85,96,241
Other constructions /development	20,00,000	1,47,67,894
TOTAL	**2,78,19,440**	**5,16,63,637**

ANNEXURE - 38 TABLE – 35

Collection plan for Fauna in Phase-II and III

SN	Animals	Enclosure	Present Stock		Future Addition		Remarks
			M	F	M	F	
I	**Class Reptilia**						
1.	Sea Turtles (Hawksbill) (Total 4 spp)	Marine Enclosure			2	2	
2.	Snakes (King Cobra: AndamanCobra; Andaman Krait; Pit Vipers; Kukris & Wolf Snakes etc)–(Total12 Spp)	Serpentarium			2 of each species	2 of each species	
3.	Geckos & Skinks (Total 12 Spp)	Reptile House			2 of each spp	2 of each spp	
ii.	**Class Aves**						
1.	Doves & Pigeons (Total 5 Spp)	Doves & Pigeons			2 of each	4 of each	
2	Parakeets & Lorikeets (Total 7spp)	Parakeets & Lorikeets			2 of each	4 of each	
3.	Hawks & eagles (Total 5 spp)	Hawks & eagles			1 of each	2 of each	

4.	Narcondam Hornbill	Hornbill + Breeding Facility			1+2*	I+2*	*Separate breeding pairs in the Conservation Facility
5.	Nicobar Megapode	Megapode + Breeding Facility			1 + 1*	1+2*	-Do-
6.	Nicobar Pigeon	Pigeon + breeding Facility			2+2*	2+2*	-Do-
7.	Owls (Total 6 spp)	Nocturnal Animal House			1 of each	2 of each	
8.	Other birds viz. Andaman Wood Pecker; Andaman Concal; Minivet; Oriental Magpie-Robin; White-Headed Starling; Andamn Bulbul Hill Myna; Orioles; Drongos; Aquatic birds- Andaman Teals, Bittern, egrets, etc Total 25 spp)	Walk- through – Aviary			2 of each species	4 of each species	

9.	Terrestrial Birds (12 Species)	Terrestrial Bird enclosures (12 Nos.)	**02+02+32**		2 of each species	2 of each species	**02 species of Parakeets & 01 species of Pigeon are in enclosures**
III.	**Class Mammalia**						
1.	Bats	Nocturnal Animal House			2	6	
2.	Shrews (2 Spp)	-do-			2 of each	4 of each	
3.	Andaman Palm Civet	Nocturnal Animal House			1	2	
V	**Marine Animals**						
1.	Coral reef (fauna)	Aquarium			-	-	
2	Reef Fishes, Marine animals etc	Aquarium			-	-	
VI	**Insects and Butterflies**						
1	Butterflies	Butterfly House			-	-	Possible endemic species
2	Insects, Arthopods-Centipedes & Spiders,	Insectarium			-	-	-do-
3	Robber Crab	Separate enclosure			2	4	

ANNEXURE - 39 TABLE – 36

Collection Plan for Live Floral species

SN	Conservatories/ Houses	Plant group	Remarks
01.	Orchidarium	Orchids	Plants will be collected from the wild according to the collection plan as detailed in Part- II
02.	Fern House	Ferns and fern allies	
03.	Palmetum	Palms (Canes & Erect Palms)	
04.	Bambusetum	Bamboos	
05.	Pinetum	Gymnosperms	
06.	Herbal Garden	Medicinal & Aromatic plants	
07.	Bonsai House	Figs	
08.		Araceae; Zingiberaceae & Marantaceae	
09.		Dipterocarps	
10.		Wild Food Crops & Economically Important Plants	
11.		Endemic & Endangered Plants	
12.	Parkinson's Plot	Annonaceae	
13.	Helfer's Trail	Myrtaceae	
14.	Kurz's Corner	Euphorbiaceae	
15.		Mangroves and Littoral Species	
16.		Pandanaceae	
17.		Piperaceae	

ANNEXURE - 40 TABLE – 37

Endangered and Endemic Mammals of A&N Islands

Common Name	Scientific name	A	N	GNI	Status	Remarks
Nicobar Macaque	*Macaca fascicularis umbrosa*	A	P	P	LRnt	
Nicobar Tree Shrew	*Tupaia nicobarica*	A	A	P	En	
Andaman subanus Rat	*Rattus flebilis*	P	A	A		
Nicobar Spinebacked Rat	*Rattus pulliventer*	A	A	P		
Nicobar Rat	*Rattus palmarum*	A	P ?	P ?	VU(Dd)	
Andaman Rat	*Rattus stiocus*	P	A	A	VU(Dd)	
Malaysian Wood rat	*Rattus tiomanicus*	A	P ?	P ?	VU(Dd)	Not Endemic
	Mus famulus				En	Not Endemic
Jenkin's Shrew	*Crocidura jenkinsi*	P	A	A	Dd	
Andamans Spiny Shrew	*Crocidura hispida*	P	A	A	En(DD)	
Nicobar Spiny Shrew	*Crocidura nicobarica*				Dd	
Andaman Palm Civet	*Paguma larvata tytleri*	P			Dd	Endemic subspecies??
Andaman Wild Pig	*Sus scrofa* Linnaeus, 1758.	P				
Dugong	*Dugong dugon*	P	P	P	CR(A1a, 1c,1d)	Marine

Source: Andrews & Sankaran (2002).

IUCN Criteria – "C" Critical; "En" endangered; "VU" vulnerable; "LRnt" lower risk near threatened; Dd"data deficient.

Annexure – 41, Table – 38

Bat species found in A&N Islands

SN	*Species*	Common Name	status	Distribution
1	*Pteropus giganteus*	Indian flying fox	Stable	
2	*Pteropus vampyrus*	Large flying fox	Stable	
3	*Pteropus funulus*	Nicobar flying fox	DD	N
4	*Pteropus hypomelannus*	Island flying fox	Stable	
5	*Pteropus melanotus tyleri*	Blyth's flying fox	Stable	A
6	*Cynopterus sphinx*	Short-nosed fruit bat	Stable	A
7	*Cynopterus brachyotis*	Andaman short-nosed fruit bat	Stable	A
8	*Eonycteris spelaea*	Dawn Bat	Vulnerable	
9	*Taphozous melanopogon*	Black bearded tomb bat	DD	A
10	*Taphozous saccolaimus*	Pouch bearing bat		
11	*Megaderma spasma*	Lesser false vampire	DD	A
12	*Rhinolophus affinis*	Intermediate horse shoe bat	Stable	
13	*Rhinolophus refulgens*	Anderson's horseshoe bat	Unknown	
14	*Rhinolophus cognatus*	Andaman horse shoe bat	DD	A
15	*Hippocideros ater*	Dusky leaf nosed bat	DD	
16	*Hippocideros cinereus*	Grey leaf nosed bat	DD	
17	*Hippocideros fulvus*	Fulvous leaf nosed bat	DD	N
18	*Hippocideros pomna*	Anderson's leaf nosed bat	DD	A
19	*Hippocideros diadema*	Diadem Leaf nosed bat	DD	
20	*Myotis horsefeildii*	Horsefeild's bat	DD	A
21	*Scotophilus khulii*	Asiatic lesser house bat	DD	N
22	*Tyloncyteris pachypus*	Bamboo bat	DD	A

23	*Pipistrellus javanicus*	Javan pipistrelle	Stable	A
24	*Pipistrellus coromandra*	Coramandel pipistrelle	DD	
25	*Hesperoptenus tickelli*	Tickell's bat	DD	A
26	*Miniopterus pusillus*	Nicobar long-fingered bat	DD	
27	*Hippocideros larvatus*	Horsefiled's roundleaf bat	DD	A
28	*Rhinolophus yunanensis*	Dobson's horse shoe bat	DD	A
29	*Cynopteris sp1*	sp under id. confirmation	Unknown	A
30	*Rhinolophus sp1**	sp under id. confirmation	Unknown	A
31	*Myotis sp**	sp under id. confirmation	Unknown	A

ANNEXURE - 42 TABLE – 39

Endemic Reptiles and Amphibians of A&N Islands

SN	Species	Common Name	A	N	GNI
1	*Cyrtodactylus rubidus*		P	A	A
2	*Cyrtodactylus adleri*		A	A	P
3	*Dasia nicobarensis*	Nicobar Tree skink	A	P	A
4	*Phelsuma andamanense*	Andaman Day gecko	P	A	A
5	*Cnemaspis aff. Kandianas*				P
6	*Goniocephalus subcristatus*	Green Forest Lizard	P	P	A
7	*Scincella macrotis*		A	P?	P
8	*Bronchocelacrisiatella*		A	A	P
9	*Lipinia macrotympana*		P	P?	P
10	*Typhlops oatesi boulenger*		P	A	A
11	*Mabuya tytleri*	Tytlers Skink	P	A	A
12	*Scincella macrotis*	Whitestriped Skink	A	A	P
13	*Casymbotus aff. Platyurus*		P	A	A
14	*Dibamus nicobaricus*		A	A	P
15	*Naja sajittifera*	Andaman Cobra	p	A	A
16	*Bungarus andamanensis*	Andaman Krait	P	A	A
17	*Oligodon woodmasoni*	And. Banded Kukri	A	A	P
18	*Amphiesm nicobriense*		A	P	-
19	*Dendrolaphis pictus andamanensis*		A	A	P
20	*Bioga andamanensis*	And. Cat Snake	P	A	A
21	*Lycodon tiwarii*	Biswas'Wolf Snake	P	P?	A

22	*Boiga wallachi*		A	P?	P
23	*Gongylosoma nicobarenense*		A	A	P
24	*Trimeresurus andersoni*	Andaman pit viper	P	A	A
25	*Trimeresurus labialis*	Brownspotted pit viper	A	P	A
26	*Trimeresurus cantori*	Cantor's pit viper	P	P	A
27	*Kalouta baleata ghoshi*		P	A	A
28	*Microphyla chakrapani*		P	A	A
29	*Limnoectes andamensis*		P	A	A
30	*Limnoectes limnocharis*		P	A	A
31	*Limnoectes sp1*		P	A	A
32	*Limnoectes sp2*		P	A	A
33	*Limnoectes shompernorum*		A	A	P
34	*Polypedates insularis*		A	A	P

ANNEXURE - 43 TABLE – 40

Endemic Butterflies of A&N Islands

S.N	**Common Name**	**Species**	**S**	**E**
PAPILIONDAE				
1.	Andaman Birdwing	*Troides Helena heliconsdes*	NR	+
2.	Andaman Clubtail	*Pachliopla rhodifer*	NR	+
3.	Crimsor Rase	*P. hector*	UR	
4.	A. Common Roset	*P. aristolochiae goniopeltis*	R	
5.	X.Mime	*Chilasa clytia flawlimbatus*	R	+

6.	Great Moimore	*Papilio memon agenas*		
7.	A. Moimore	*P. Mayo*	R	+
8.	A.Helen	*P. gascus andamanicas*	R	+
9.	A. Moimore	*P. Polytes stichioides*	C	+
10.	A. fuie bar swordfail	*Graphiun astiphates Epaminondas*	NR	+
11.	A Tailed Jay	*G. agammemnon andamana*	NR	+
12.	A.Great Jay	*G.eurypylus macronius*	R	+
PIERIDAE				
13.	Painted jezebel	*Delias hyperete indica*	RC	
14.	Common gull	*Cepara nerissa dapha*	NC	
15.	A. common gull	*C.D. lichenasa*	NC	+
16.	A. lesser gull	*C. nadira andamana*	NR	+
17.	A. Orange HP	*Ixaias pyrene andamana*	NC	+
18.	A. great orang tip	*Hebomoia glaucippe roepstortil*		
19.	A. wanderer	*Pararonia ceylanica*	NC	+
20.	Common emigrane	*Colopsilia Pomona*	R	+
21.	A. tree yellow	*Gandana harina andamana*	NR	+
22.	Small grass yellow	*Eurema brigitia yabella*		
23.	Three spot grass yellow	*E. blanda silhetana*	NC	+
24.	Common grass yellow	*E. hecabe blairana*	C	+
25.	A. one spot grass yellow	*E. andersoni wansi*	R	+
LYCAENIDAE				
26.	Aa. Leaf blue	*Ambalypadia aneta andamanica*	NR	+
27.	A. Yamply	*Laxuna atymnus prapha*	R	+
28.	Wluili Royal	*Protapa deva lila*	R	+

29.	Andaman royal	*Iajuria jangala andamanica*	R	+
30.	Mandrina blue	*Charana mandrinus*	UR	+
31.	A. Orejrea	*Horaga onejre rana*	R	+
32.	A. violet orejrea	*H. albimacula*	UR	+
33.	Orchid tit	*Ghiliarea othona*	UR	+
34.	A. brown tit	*H. erylus andamana*	NR	+
35.	Green flash	*Artipe eryx*	R	+
36.	Carnelian	*Deudorix epijarbas*	NR	+
37.	Indigo flash	*R. varuna orceis amatias*	NR	+
38.	Scaelet flash	*Rapla cleneces intermedia*	NR	+
39.	Common Bay pierrot	*Castalius rosimon*	C	+
40.	Lesses grass blue	*Zizula gaila*		
41.	Plain cupid	*Euchrysops p. pandara*	C	
42.	Forget me not	*Catochrysops straba*	NR	
43.	Peablue	*Lampides bareticus*	NR	+
44.	Dark cerulean	*Jaemdes b. bochus*	C	+
45.	Andaman common cerulean	*J. Celeno blacerana*	C	+
46.	A. metatea cerulean	*J. aleclo fusca*	NR	+
47.	A. large li giniblue	*Nacodeeba pactolus*	NR	+
48.	Transparent olineblue	*N. kurava euplea*	NR	+
49.	A. painted blue	*Looly ce helicon*	NR	+
50.	Banded lineblue	*Prosotas aluta wetistis*	NR	
51.	Commo line blue	*P.A nora*	NR	
52.	Dingy line blue	*Petrelaea dana*	NR	

53.	A. ciliate blue	*Anthene emolus*	NR	+
54.	A sunbeam	*Cunetis thetus saronis*	NR	+
RIODIONIDAE				
55.	A. palm judy	*Abisara echerius bitasciata*	NR	+
NYMPHALIDAE				
56.	Taway Rajah	*Charaxes bernardus agna*		
57.	Blue nawab	*Polyura Schreiber tismentus*	UR	+
58.	A.Nawab	*P. athamas andamanicus*	R	+
59.	A. pasha	*Herona mathus andamana*	R	+

ANNEXURE - 44 TABLE – 41

REPTILES OF ANDAMAN AND NICOBAR ISLANDS

Sl. No	COMMON NAME	SCIENTIFIC NAME
1.	Bronze Back, Andaman	*Dendrelaphis ahaetulla andamanesis*
2.	Bronze Back, Daudin's	*Dendrelaphis tristis*
3.	Bronze Back, Painted	*Dendrelaphis pictus andamenensis*
4.	Bronze Back, Tiwari's	*Dendrelaphis humayuni*
5.	Cobra, King	*Ophiophagus Hannah*
6.	Cobra, Monocellate	*Naja naja kaouthia*
7.	Cobra, Andaman	*Naja sagittifera*
8.	Crocodile, Estuarine	*Crocodilus porosus*
9.	Gecko, Flat tailed	*Cosymbotus platyurus*
10.	Gecko, Bllecker	*Hemiphyllodactylus typus typus*
11.	Gecko, Andaman Day	*Phelsuma andamanense*
12.	Gecko, Curtailed	*Cyrtodactylus rubidus*
13.	Gecko, Nicobar Bent-toed	*Cyrtodactylus adleri*
14.	Gecko, Flapsided	*Platyurus sp.*
15.	Gecko, Flying	*Ptychozoon kuhili*
16.	Gecko, Forest Day	*Cnemaspis kandiana*
17.	Gecko, House	*Hemidactylus frenatus*
18.	Gecko, Smith's (Gray)	*Gekko smithi*
19.	Gecko, Spotted	*Gehyra mutilate*
20.	Gecko, Stripeheaded	*Lepidodactylus lagubris*
21.	Gecko, Andaman Giant	*Gecko verreauxi*
22.	Keelback, Striped	*Amphiesma stolata*
23.	Krait, Andaman Banded	*Bungarus andamanensis*
24.	Krait, Common	*Bungarus coeruleus*
25.	Krait, Many Banded	*Bungarus multicinclus*
26.	Kukri, Andaman Banded	*Oligodon woodmasoni*
27.	Lizard, Andaman Garden	*Calotes andamanensis*
28.	Lizard, Common Garden	*Calotes versicolor*

29.	Lizard, Garden	*Calotes calotes*
30.	Lizard, Green Forest	*Goniocephalus subcristatus*
31.	*Lizard, Green Garden*	*Calotes cristatellus*
32.	*Lizard, Green*	*Calotes emma alticristatus*
33.	Lizard, Spotted Garden	*Calotes jubetus*
34.	Lizard, Tiwari's Garden	*Calotes danieli*
35.	Lizard, White-lipped Garden	*Calotes mystaceus*
36.	Lizard, Nicobar Worm	*Dibamus nicobaricum*
37.	Monitor, Andaman Water	*Varanus salvator andamanensis*
38.	Python, Reticulated	*Python reticulates*
39.	Skink, Rafinesque	*Mabuya rudis*
40.	Skink, Andaman	*Mabuya andamanensis*
41.	Skink, Blackstriped	*Rioba bowringii*
42.	Skink, Brown	*Mabuya rugifera*
43.	Skink, Brownbacked	*Sphenomorphos maculatum*
44.	Skink, Lesser Brownback	*Leiolopsima macrotis*
45.	Skink, Lined	*Mabuya multifasciata*
46.	Skink, New Guinea Limbless	*Dibamus novaeguineae*
47.	Skink, Nicobar Legless	*Typhloscinucus nicobaricus*
48.	Skink, Nicobar Tree	*Dasia nicobarensis*
49.	Skink, Peter's	*Sphenomorphos quadrivittatum*
50.	Skink, Tree	*Dasia olivacea*
51.	Skink, Tytler's	*Mabuya tytleri*
52.	Skink, Whitestriped	*Scincella macrotympanum*
53.	Skink, Small-eared Island	*Lypnia macrotympanum*
54.	Snake, Amphibious Sea	*Laticauda laticauda*
55.	Snake, Andaman Blind	*Typhlops andamanensis*
56.	Snake, Andaman Cat	*Boiga andamanensis*
57.	Snake (Dum., Bibr. And Dum)	*Boiga cyaneum*
58.	Snake, Nicobar Cat	*Boiga wallachi*
59.	Snake, Indian Rat	*Coluber mucosusmucosus*
60.	Snake, Andaman Water	*Xenochropis piscator andamanensis*

61.	Snake, Water	*Xenochropis piscator melanzostus*
62.	Snake, Banded Swamp	*Cantoria violacea*
63.	Snake, Biswas's Wolf	*Lycodon tiwarii*
64.	Snake, Blackheaded Hill	*Sibynophis bistrigatus*
65.	Snake, Boie's Cat	*Boiga dendrophilus*
66.	Snake, Boie's Water	*Xenochropis trianguligera*
67.	Snake, Brown Wolf	*Lycodon aulicus capucinus*
68.	Snake, Colubrine Amphibious Sea	*Laticauda colubrine*
69.	Snake, Common Blind	*Ramphotyphlops braminus*
70.	Snake, Common Water	*Xenochropis piscator piscator*
71.	Snake, Dog faced Water	*Cerberus rhynchops*
72.	Snake, Elephant Trunk	*Acrochordus granulates*
73.	Snake, Flying	*Chrysopelea paradise*
74.	Snake, Green Tree	*Dendrelaphis cyanochloris*
75.	Snake, Indian Rat	*Ptyas mucosus*
76.	Snake, Nicobar Stripedneck	*Liopeltis nicobariensis*
77.	Snake, Nicobar Water	*Xenochrophis nicobariensis*
78.	Snake, Oat's Blind	*Typhlops oateri*
79.	Snake, Smith's Cat	*Boiga ochracea walli*
80.	Snake, Sunbeam	*Xenopeltis unicolor*
81.	Snake, White bellied Water	*Fordonia leucobalia*
82.	Tokay, Asian	*Gecko gecko*
83.	Tortoise, Malayan Box	*Cuora amboinensis*
84.	Trinket, Green	*Elaphe prasina*
85.	Trinket, Red tailed	*Elaphe oxycephala*
86.	Trinket, Yellow striped	*Elaphe flavolineata*
87.	Turtle, Green Sea	*Chelonia mydas*
88.	Turtle, Hawksbill	*Eretmochelys imbricata squamata*
89.	Turtle, Leathery or Leatherback	*Dermochelys coriacea*
90.	Turtle, Loggerhead	*Caretta caretta*
91.	Turtle, Olive Ridley	*Lepidochelys olivacea*

92.	Turtle, Southern Flapshelled	*Lissemys punctata granosa*
93.	Viper, Andaman Pit	*Trimeresurus purpureomaculatus andersoni*
94.	Viper, Brown spotted Pit	*Trimeresurus labialis*
95.	Viper, Cantor's Pit	*Trimeresurus cantor*
96.	Viper, Whitelipped Pit	*Trimeresurus albolabris*
97.	Miller	*Crocidura nicobarica*
98.	Guenther	*Microcephalophis cantors*

ANNEXURE - 45 TABLE – 42

COMMON FISHES FOUND IN ANDAMAN AND NICOBAR ISLANDS

Sl. No.	Common Name	*Scientific Name*	Local Name
1.	Anchovy, Mustached	*Thryssa mystax*	Khori
2.	Angelfish, Dusky	*Centrophyge nox*	-
3.	Bannerfish, Humphead	*Heniochus varius*	Hasli Machli
4.	Barracuda, Giant	*Sphyraena barracuda*	Dandus
5.	Bass, Moon tail Sea	*Variola louti*	Lal Gobra
6.	Bass, Spotted Coral Sea	*Plectropomus maculatus*	Gobra
7.	Batfish, Long finned	*Platax teira*	Pankha Machli
8.	Batfish, Silver	*Monodactylus argenteus*	Safed Paplet
9.	Biddy, Blue Backed Silver	*Gerres abbreviatus*	Poti Machli
10.	Blowfish, Reticulated	*Arothron reticularis*	Padpuli
11.	Boxfish, Humpbacked	*Tetrasomus gibbosus*	Gai Machli
12.	Bream. Blue Lined Large Eyed	*Gymnocranius robbinsoni*	Koku
13.	Bream, Red Spine Thread Fin	*Namipterus nemurus*	Pooma
14.	Butterflyfish, Long nose	*Forcipiger flavissimus*	-
15.	Cardinal fish, Golden	*Apogon fleurien*	Burma Machli
16.	Carp	*Catla catla*	Katla
17.	Carp	*Labeo rohita*	Rohoo
18.	Carp	*Labeo calbasu*	Rohoo
19.	Carp	*Cirrhinus mrigala*	Mrigal
20.	Catfish, Stinging	*Heteropneustes fossilis*	Sindhi
21.	Cod, Peacock Coral	*Cephalopholis argus*	Gobra
22.	Cod, Red Coral	*Cephalopholis sonnerati*	Lal Gobra
23.	Coralfish,Pennant	*Heniochus acuminatus*	Pankha Machli

24.	Cordinal, Brown Speckled	*Apogon sangiensis*	Burma Machli
25.	Cowfish, Long Horned	*Lactoria cornuta*	Gai Machli
26.	Drummer, Ashen	*Kyphosus cinerascens*	Pather Jeevan Machli
27.	Filefish, Golden Fin	*Balistes chrysopterus*	Suar Machli
28.	Flying fish	*Cypselurus comatus*	Chidiya Machli
29.	Fusilier	*Caesio erythrogaster*	Jeevan Machli
30.	Goatfish	*Parupeneus chryserydros*	Thadi Machli
31.	Halibut, Indian	*Psettodes erumei*	Pathi Machli
32.	Herring, Giant	*Elops machnata*	Roi Machli
33.	Jewfish, Russels	*Dendrophysa russelli*	Rui Machli
34.	Mackeral Tuna	*Euthynnus affinis*	Khatta Bangdi
35.	Mackeral, Faughns	*Rastrelliger faughni mats*	-
36.	Mackeral, Rake Gilled	*Rastrekkuger kanakurta*	Bangdi
37.	Mackeral, Short Bodied	*Rastrelliger brackysoma*	Chappada
38.	Mackeral, Spotted Spanish	*Scomberomorus guttatus*	Surmai
39.	Milkfish	*Chanos chanos*	Roi
40.	Monocle, Blue Cheeked	*Scolopsis phaeops*	Badak Machli
41.	Moorish Idol	*Zanclus canescens*	Ban Machli
42.	Mullet, Blue Spot Grey	*Valanugli seheli*	Parsa Machli
43.	Mullet, Green Back Grey	*Liza subviridis*	Parsa Machli
44.	Parrotfish, Dussumiers	*Scarus dussumierid*	Thota Machli
45.	Parrotfish, Lame	*Scarus ghobhan*	Thota Machli
46.	Parrotfish, Red toothed	*Scarus erythrodon*	Thota Machli
47.	Parrotfish, Redlined	*Scarus harid*	Thota Machli
48.	Pike, Giant Sea	*Sphyraena jello*	Dandus
49.	Pomfret, Chinese	*Pampus chinensis*	Paplet

50.	Pomfret, Silver	*Pampus argentius*	Paplet
51.	Pony fish, Banded	*Leiognathus fasciatus*	Chanda Machli
52.	Pony fish, Greater	*Leiognathus equlus*	Chanda Machli
53.	Porcupine fish	*Diodon hystrix*	Padpuli
54.	Puller, White Spot	*Dascyllus trimaculatus*	Puchdi Machli
55.	Ray, Banded Whip Tail Sting	*Himantura uarnak*	Sankar Machli
56.	Ray, Scaly Sting	*Amphotistius imbricatus*	Sankar Machli
57.	Ray, Spotted Eagle	*Aetobatus narinari*	Sankar Machli
58.	Sardine. Oil	*Sardinella longiceps*	Tharni
59.	Shark, Black	*Carcharinus melanopterus*	Badmaash
60.	Shark, Grey Dog	*Rhizoprionodon acutus*	Badmaash
61.	Shark, Ridge Back Cat	*Chiloscyllium indicum*	Badmaash
62.	Shark, Squat Headed Hammer Head	*Sphyrna tudes*	Badmaash
63.	Shark, Thresher	*Alopias vulpinus*	Badmaash
64.	Shark, White Checked	*Carcharinus dussumierii*	Badmaash
65.	Shark, Yellow Dog	*Scolidon laticaudus*	Badmaash
66.	Snapper, Black and White	*Macolor niger*	Pather katla
67.	Snapper, Hunched	*Lutijanus gibbus*	Lal Machli
68.	Snapper, Red	*Lutijanus argentimaculatus*	Bhedki Machli
69.	Spadefish	*Ephippus orbis*	Safed Paplet
70.	Spine foot, Marbled	*Siganus spinus*	Pather Machli
71.	Spine foot, White Spotted	*Siganus oramin*	Pather Machli
72.	Sprat, Common	*Dussumieria acuta*	Kappa tharni
73.	Surgeon, White breasted	*Acanthurus leucosternon*	Ban Machli
74.	Surgeonfish, Blue	*Paracanthurus hepatus*	Ban Machli

75.	Surgeonfish, Blue Finned	*Acanthurus lineatus*	Ban Machli
76.	Sweet lip, Painted	*Plectorhynchus pictus*	Kamjor Katla
77.	Swordfish	*Xiphius gladius*	Hawabil Surmai
78.	Tassel fish, Indian	*Polynemus indicus*	Kuruchi Machli
79.	Tilapia	*Tilapis mossambica*	American koi
80.	Trevelly, Malabar	*Carangoides malabaricus*	Kokari
81.	Trevelly, Yellow Fin	*Caranx ignobilis*	Kokari
82.	Unicorn fish, Long snouted	*Naso unicornis*	Ban Machli
83.	Whitefish	*Lactarius lactarius*	Safed Paplet
84.	Wrasse, Blue Spotted	*Anampses caeruleopunctatus*	Thota Machli
85.	Wrasse, False Clown	*Coris gaimard*	Thota Machli
86.	Wrasse, Green	*Thalassoma lunare*	Thota Machli
87.	Wrasse, Peacock	*Inistius paro*	Thota Machli
88.	Wrasse, Yellow Cleaner	*Labroides bicolor*	Thota Machli

ANNEXURE - 46 TABLE – 43

LIST OF PLANTS IN ANDAMAN AND NICOBAR ISLANDS

Sl. No.	Botanical Name	Habit	Vernacular Name
1.	*Abrus precatorius* L.	C	Gunchi, Rati (Hindi)
2.	*Acacia auriculiformis* A.Cunn.	T	Akarhananni (Bengali)
3.	*Acalypha indica* L.	H	Kuppi,Khokli (Hindi)
4.	*Achyranthes aspera* L.	H	Latjira(Hindi)
5.	*Acronychia pedunculata* (L.) Miq.	S	Jangli Nimbu,Khopi Balli
6.	*Acrostichum aureum* L.	H	Khari Bhaji
7.	*Actinodaphne angustifolia* Nees	S	Thali(Tamil)
8.	*Adenanthera pavonina* L.	T	Kunchandana (Sanskrit), Ywegi
9.	*Aegiceras corniculatum* (L.) Blanco	T	Safed Khari
10.	*Aglaia andamanica* Hiern	T	Letauk
11.	*Aglaia ganggo* Miq.	T	Lal Neem,Lal Latau
12.	*Ailanthus kurzii*	T	Alianthus
13.	*Albizzia chinensis* (Osb.) Merr.	T	Bambeza
14.	*Albizzia lebbek* (L.) Bethh.	T	Koko
15.	*Albizzia odoratissima* Bethh.	T	Kala Siris (Hindi)
16.	*Albizzia procera* (Roxb.) Bethh.	T	Safed Siris (Hindi)
17.	*Albizzia stipulata*	T	Bombeza
18.	*Allophylus cobbe* (L.) Raeusch.	S	Charai Garua
19.	*Alstonia kurzii* Hk.f.	T	Chattiyan
20.	*Amoora wallichii*	T	Lalchini
21.	*Amorphophallus campanulatus* (Roxb.) Bl.ex Decne.	H	Zamin-Kand (Hindi)
22.	*Amorphophallus longistylus* Kurz ex Hook. f.	H	Jungli-ol
23.	*Anacardium occidentale* L.	T	Kaju(Hindi)
24.	*Anamirta cocculus* (L.) W. & A.	C	Kakamari(Sanskrit)
25.	*Anaxagorea luzonensis* A.Gray	S	Jinda Balli,Telai
26.	*Ancistrocladus tectorius* (Lour.) Merr.	S	Kawao Tambel

27.	*Andrographis paniculata* Nees	H	Kirayat(Hindi)
28.	*Angiopteris lygodiifolia* Roscust	H	Kukri Bhaji
29.	*Anodendron paniculatum* (Roxb.) A. DC.	C	Kavali (Marathi)
30.	*Anthocephalus chinensis* (Lam.) Rich. ex Walp.	T	Kadam
31.	*Antiaris toxicaria* (Pers.) Lesch.	T	Jungli Lakuch
32.	*Aphanamixis polystachya* (Wall.) Parker	T	Harinharra(Hindi)
33.	*Aporusa dioica* (Roxb.) Muell.-Arg.	T	Kokra(Bengali)
34.	*Ardisia andamanica* Kurz	T	Rakhat
35.	*Ardisia solanacea* Roxb.	T	Manipudbam (Tamil)
36.	*Areca triandra* Roxb.	S	Jungli Supari
37.	*Aristolochia tagala* Cham.	C	Nallayiswari(Telegu)
38.	*Artabotrys hexapetalus* (L.f.) Bhan.	S	Hara Chawpaca (Sanskrit)
39.	*Artabotrys speciosus* Kurz	S	Suar Bel
40.	*Artocarpus chama* Buch.-Ham.	T	Jungli Kathal
41.	*Artocarpus chaplasha* Roxb.	T	Toungpinne
42.	*Artocarpus gomeziana* Wall. ex Trec.	T	Lakuch
43.	*Artocarpus lakoocha* Roxb.	T	Lakuch
44.	*Astragalus hamosus* L.	C	Jungli Newa
45.	*Atalantia malabarica* (Rafin.) Tanaka	T	Jungli Nimbu
46.	*Avicennia alba* Bl.	T	Bina (Hindi)
47.	*Avicennia marina* (Forsk.) Vierh	T	Khari Gum
48.	*Avicennia officinalis* L.	T	Safed Khari
49.	*Axanopus compressus* (Sw.) P.Beauv.	H	Khatta Grass
50.	*Baccaurea ramiflora* Lour.	T	Pharsa Balli
51.	*Baccaurea sapida* (Roxb.) Muell.-Arg.	T	Khatta Phal
52.	*Barleria prionitis* L.	S	Jhinti,Katsareya (Hindi)
53.	*Barringtonia asiatica* (L.) Kurz	T	Dodda,Kinyav,Cingola
54.	*Barringtonia racemosa* (L.) Spreng.	T	Bada Khari
55.	*Bischofia javanica* Bl.	T	Pani Padauk
56.	*Blumea lacera* (Burm.f.) DC.	H	Kakranda (Hindi)

57.	*Blumeodendron kurzii* (Hk.f.) Sm.	T	Kartoos
58.	*Bombax insigne* Wall.	T	Didu
59.	*Borreria articularis* (L.f.) F.N. Will.	H	Guthari (Hindi)
60.	*Bouea oppositifolia* (Roxb.) Meissn.	T	Marium
61.	*Breynia retusa* (Dennst.) Alst.	S	Fanot, Pitcong
62.	*Breynia rhamnoides* (Willd.) Muell.-Arg.	S	Tikhar(Hindi)
63.	*Bridelia tomentosa* Bl.var. *oblonga* Gehrm.	T	Ka-noh,Ranam
64.	*Bruguiera gymnorrhiza* (L.) Lam.	T	Lal Khari
65.	*Bruguiera parviflora* Wight & Arn.	T	Mehndi Khari
66.	*Byttneria andamanensis* Kurz	C	Caint Bel
67.	*Byttneria aspera* Colebr.	C	Hathi Bel
68.	*Caesalpinia bonduc* (L.) Roxb.	C	aknuato,Kat Karanj
69.	*Caesalpinia crista* L.	C	Billi Kanta
70.	*Caesalpinia nuga* (L.) Ait.	C	Mulutiga (Telegu)
71.	*Calamus andamanicus* Kurz	S	Mota Beth
72.	*Calamus longisetus* Griff.	S	Jungli Beth
73.	*Calamus palustris* Griff.	S	Malai Beth
74.	*Calamus pseudo-rivalis* Becc.	S	Safed Beth
75.	*Calamus viminalis* Willd.	S	Rassi Beth
76.	*Callicarpa longifolia* Lam.	S	Kin-vi-tai (Nicobarese)
77.	*Calophyllum inophyllum* L.	T	Poon
78.	*Calophyllum soulattri* Burm.f.	T	Lalchini (Hindi); Dakar-Talada (Andamanese)
79.	*Calopyllum wallichianum* Planch. & Trian.	T	Chota Poon
80.	*Canarium euphyllum* Kurz	T	White Dhup
81.	*Canarium strictum* Roxb.	T	Black Dhup
82.	*Canavalia cathartica* Thou.	C	Minuhaeh
83.	*Canavalia turgida* Grah.	C	Minuhaeh
84.	*Canthium dicoccum* (Gaertn.)	T	Kataki
85.	*Capparis sepiaria* L.	C	Kanthari (Telegu)
86.	*Capparis zeylanica* L.	C	Ardanda (Hindi)

87.	*Carallia brachiata* (Lour.) Merr.	T	Carallia Wood
88.	*Carex cryptostachys* Brongn.	H	Churia Grass
89.	*Caryota mitis* Lour.	T	Mari Patti
90.	*Cassia fistula* L.	T	Amaltas (Hindi)
91.	*Cassia tora* L.	H	Milum-anh(Nicobarese)
92.	*Casuarina equisetifolia* L.	T	Beef Wood, Jangli Saru
93.	*Cayratia japonica* (Thunb.) Gagnep.	H	Kitohot (Nicobarese)
94.	*Cayratia pedata* (Wall.) Gagnep.	H	Tripadi
95.	*Celastrus paniculatus* Willd.	S	Malkangni (Hindi)
96.	*Celtis timorensis* Span.	T	Tejpatti
97.	*Celtis wightii* Planch.	T	Vakkanai(Tamil)
98.	*Centella asiatica* (L.) Urb.	H	Medak Bhaji
99.	*Cerbera odollam* Gaertn.	T	Kottuma (Tamil)
100.	*Cerbera manghas* L.	T	Kodalma(Tamil)
101.	*Ceriops tagal* (Perr.) C.B.Robins.	T	Khari Mehendi
102.	*Champereia mainillana* (Bl.) Merr.	T	Meetha Bhaji
103.	*Chassalia curviflora* (Wall.) Thw. var.*ophioxyloides* (Wall.) Deb & Krishna	T	Vellakurinjii (Marathi)
104.	*Chilocarpus sunainaianus* Yog.	C	Dudhia Bel
105.	*Chrysopogon aciculatus* (Retz.) Trin.	H	Surwala (Hindi)
106.	*Chukrasia tabularis* A.Juss.	T	Agil, Chakrasia
107.	*Chydenanthus excelsus* (Bl.) Miers.	T	Bhelwa
108.	*Cinnamomum obtusifolium* (Roxb.) Nees	T	Junlgi Dalchini
109.	*Cinnamomum tamala* Fr.Nees	T	Tejpat(Hindi)
110.	*Cinnamomum zeylanicum* Garc.ex Bl.	T	Dalchini (Hindi)
111.	*Cissus hastata* Miq.	C	Khatta Bel
112.	*Cissus repens* Lam.	C	Nelaboddu (Telegu)
113.	*Claoxylon indicum* (Bl.) Hassk.	T	Bharanga
114.	*Cleidion javanicum* Bl.	T	Putri
115.	*Clematis smilacifolia* Wall. ssp. *andamanica* Kapoor	C	Gurraputiga (Telegu)

116.	*Clerodendrum colebrookianum* Walp.	S	Ghato Patti
117.	*Clerodendrum inerme* (L.) Gaertn.	S	Lanjai (Hindi)
118.	*Clerodendrum viscosum* Vent.	S	Bhant (Hindi)
119.	*Cnestis palala* (Lour.) Merr.	S	Kyetmaukni (Burmese)
120.	*Cocos nucifera* L.	T	Naryal, The Coconut Palm
121.	*Coffea liberica* Bull. ex Hiern	T	Pako
122.	*Colocasia esculenta* (L.) Schott	H	Junlgi Ghuia,Kanda
123.	*Colocasia virosa* Kunth	H	Bish Kachu (Bengali)
124.	*Colubrina asiatica* (L.) Brongn.	C	Mayir Manikkam (Tamil)
125.	*Costus speciosus* (Koen.) Sm.	H	Bander Louri
126.	*Crateva religiosa* Forst.f.	T	Barum (Hindi)
127.	*Crinum asiaticum* L.	H	Kanwal, Pindar (Hindi)
128.	*Curcuma mangga* Val. & Van Zip.	H	Jungli Adrakh
129.	*Cycas rumphii* Miq.	T	Arguna
130.	*Cyclea peltata* (Lam.)Hk.f.&Th.	C	Chaneum ,Emos (Nicobarese)
131.	*Cynodon dactylon* (L.) Pers.	H	Dub Ghas,Bermuda
132.	*Cynometra iripa* Kosterm.	T	Iripa (Malayalam)
133.	*Daemonorops kurzianus* Hk.f.	S	Sanga Beth, Aprang
134.	*Dendrolobium umbellatum* (L.) Bethh.	T	Rana (Nicobarese), Damle(Onges)
135.	*Dendrophthoe falcate* (L. f.) Etting	H	Banda (Hindi)
136.	*Derris scandens* (Roxb.) Bethh.	C	Karwa Bel
137.	*Derris trifoliata* Lour.	C	Panlata (Bengali)
138.	*Derris uliginosa* (Willd.) Bethh.	C	Panlata (Bengali)
139.	*Desmodium gangeticum* (L.) DC.	H	Sarivan (Hindi)
140.	*Desmodium heterocarpon* (L.) DC.	H	Boephol (Hindi)
141.	*Desmodium triquetrum* (L.) DC.	H	Dammidi (Telegu)
142.	*Dillenia pentagyna*	T	Korkot
143.	*Dillenia spp.*	T	Sambium
144.	*Dinochloa scandens* (Bl.ex Nees) O.Kuntze	S	Bel Bamboo,Climbing Bamboo

145.	*Dioscorea belophylla* Voigt ex Haines	C	Gethi Kanda
146.	*Dioscorea oppositifolia* L.	C	Kavalakodi (Tamil)
147.	*Dioscorea pentaphylla* L.	C	Kanta Alu (Hindi)
148.	*Diospyros crumenata* Thw.	T	Kala Balli, Kendu
149.	*Diospyros kurzii* Hiern	T	Loha Balli, Cheenti Balli
150.	*Diospyros montana* Roxb.	T	Lohari (Hindi)
151.	*Diospyros montana* Roxb. var. *cordifolia* (Roxb.) Hiern	T	Bisterndu,Lohari (Hindi)
152.	*Diospyros marmorata* Parker	T	Kala Lakri, Marble Wood
153.	*Diospyros pilosiuscula* Wall. ex G.Don	T	Chotapatti Kendu
154.	*Diospyros pyrrhocarpa* Miq var. *andamanica* Kurz	T	Badapatti Kendu
155.	*Diospyros undulata Wall.* ex G.Don	T	Agia Balli
156.	*Diospyros variegata* Kurz	T	Fanda Balli
157.	*Diploclisia glaucescens* (Bl.) Diels	C	Kottaiyachachi (Tamil)
158.	*Diploknema butyracea* (Roxb.) Lam.	T	Hill Mahowa
159.	*Dipteracanthus prostratus* (Poir.) Nees	H	Upudali (Malayalam)
160.	*Dipterocarpus costatus* Gaertn.f.	T	Gurjan
161.	*Dipterocarpus gracilis* Bl.	T	Chotapatti Gurjan
162.	*Dipterocarpus grandiflorus* (Blanco) Blanco	T	Lambapatti Gurjan
163.	*Dipterocarpus griffithii* Miq.	T	Gurjan
164.	*Dipterocarpus alatus* Roxb.	T	Gurjan
165.	*Dipterocarpus turbinatus* Gaertn.	T	Teli Gurjan (Bengali)
166.	*Dischidia major* (Vahl) Merr.	H	Bandikuri (Assamese)
167.	*Dolichandrone spathacea* (L.) K.Sch.	T	Pharsa
168.	*Dracaena angustifolia* Roxb.	S	Bakripatti,Sumai
169.	*Dracaena pachyphylla* Kurz	T	Surmai
170.	*Dracaena spicata* Roxb.	T	Surmai
171.	*Dracantomalum mangifera*	T	Chinyok
172.	*Drimycarpus racemosus* (Roxb.) Hk.f. ex Bedd.	T	Char, Char Phal
173.	*Duabanga soneratioides*	T	Mau
174.	*Drynaria quercifolia* (L.) J.Sm.	H	Ashvakatri (Sanskrit)

175.	*Dysoxylum arborescens* (Bl.) Miq.	T	Danda Balli
176.	*Dysoxylum binecteriferum* (Roxb.) Hk. f.	T	Agunivagid (Tamil)
177.	*Ebermaiera staurogyne* Nees	H	Kichar Buti
178.	*Elaeagnus latifolia* L.	T	Jungli Khatta
179.	*Elaeocarpus aristatus* Roxb.	T	Min-rel (Nicobarese)
180.	*Elaeocarpus macrocerus* (Turcz.) Merr.	T	Phutkuli (Assamese)
181.	*Elaeocarpus petiolatus* (Jack.) Wall.ex Steud.	T	Holthak
182.	*Elaeocarpus robustus* Roxb.	T	Malam Kara (Malayalam)
183.	*Endospermum chinense*	T	Bokota
184.	*Entada phaseoloides* (L.) Merr.	C	Madrasi Bel
185.	*Enterolobium saman*	T	Siris
186.	*Eranthemum album* Nees	H	Lanvoh (Nicobarese)
187.	*Erycibe peguensis* (Cl.) Prain	C	Muiyo (Nicobarese)
188.	*Erythrina variegata* L.	T	Mokek (Nicobarese)
189.	*Erythropsis colorata* (Roxb.) Burkill	S	Berda (Andamanese)
190.	*Eulophia nuda* Lindl.	H	Goruma (Hindi)
191.	*Euphorbia hirta* L.	H	Dudhi (Hindi)
192.	*Euphoria longan* Steud.	T	Puvatti (Tamil); Pasakotta (Malayalam)
193.	*Evodia glabra* Bl.	T	Iodio
194.	*Evodia lunu-ankenda* (Gaertn.) Merr.	T	Kanabi (Malayalam)
195.	*Evolvulus alsinoides* L.	H	Sankhapuspi (Hindi)
196.	*Excoecaria agallocha* L.	T	Dhood Khari
197.	*Fagraea racemosa* Jack ex Wall.	T	Khari Balli
198.	*Ficus arnottiana* Miq.	T	Paraspipal (Hindi)
199.	*Ficus benjamina* L.	T	Putra-jubi (Marathi)
200.	*Ficus fistulosa* Reinw.ex Bl.	T	Kathia-dimaru
201.	*Ficus hispida* L.f.	T	Gular,Dumar
202.	*Ficus racemosa* L.	T	Lal Gular
203.	*Ficus rumphii* Bl.	T	Pakar (Hindi)
204.	*Ficus sagittata* Vahl	C	Pepal Bel

205.	*Ficus virens* Ait.	T	Pilkhan (Hindi); Kurugu (Tamil)
206.	*Flacourtia indica* (Burm.f.) Merr.	T	Bilangra (Hindi)
207.	*Flacourtia jangomas* (Lour.) Raeusch.	S	Talispatri (Hindi)
208.	*Flagellaria indica* L.	C	Panambuvalli (Hindi)
209.	*Flemingia macrophylla* (Willd.) Kuntz. Et Prain	H	Bara-Salpan (Hindi)
210.	*Flemingia strobilifera* (L.) R.Br.& Ait.	H	Kusruni (Hindi)
211.	*Freycinetia insignis* Bl.	C	Surmai Bel
212.	*Friesodielsia fornicata* (Roxb.) Das	C	Alkuchia Bel
213.	*Ganophyllum falcatum* Bl.	T	Jungli Neem
214.	*Garcinia andamanica* King	T	White Madaw
215.	*Garcinia cowa* Roxb.	T	Kao,Khatta Phal
216.	*Garcinia nervosa* Miq.	T	Lewing Khatta
217.	*Garcinia nicobarica* King	S	Wild Mangosteen
218.	*Garcinia speciosa* Wall.	T	Khaiya
219.	*Garcinia xanthochymus* Hk.f. & T. Andr.	T	Rakhat Medha
220.	*Garuga pinnata* Roxb.	T	Ghogar (Hindi)
221.	*Gelonium bifarium* Roxb.	S	Jungli Kathal
222.	*Gelonium multiflorum* A.Juss.	S	Ban-naringa (Hindi)
223.	*Geodorum laxiflorum* Griff	H	Jungli Pyaj
224.	*Geophila reniformis* D.Don	H	Kudi-mankuni (Bengali)
225.	*Gigantochloa nigro-ciliata* (Buese) Kurz	S	Bans
226.	*Glochidion calocarpum* Kurz	T	Khatta,Angchongsi (Nicobarese)
227.	*Glochidion sumatranum* Miq.	T	Hinyoy (Nicobarese)
228.	Glycosmis mauritiana (Lam.) Tanaka var. andamanensis (Naray.)Tanaka	T	Jungli Neem,Obe (Onge)
229.	*Glycosmis pentaphylla* (Retz.) Corr.	T	Kanta
230.	*Gnetum latifolium* Bl.var. *macropodium* (Bl.) Mgf.	C	Suar Bel
231.	*Gnetum montanum* Mgf.	C	Ula (Malayalam)

232.	*Gnetum scandens* Roxb.	C	Pani Bel
233.	*Goniothalamus macranthus* (Kurz) Boerl.	T	Bhasa, Bhasa Balli
234.	*Grewia glabra* Bl.	T	Bhimul, Kakki (Hindi)
235.	*Guettarda speciosa* L.	T	Karmi, Tu-ma-halu (Nicobarese)
236.	*Harrisonia perforata* (Blanco) Merr.	S	Gajar Bel
237.	*Heritiera littoralis* Dryander ex W. Ait.	T	Sundri
238.	*Hevea brasiliensis* (Willd.) Muell.-Arg.	T	Rubber
239.	*Hibiscus mutabilis* L.	S	Guliajaib (Hindi)
240.	*Hibiscus tiliaceus* L.	T	Safed Chilka
241.	*Hopea odorata* Roxb.	T	White Thingan
242.	*Horsfieldia glabra* (Bl.) Warb.	T	Banda Jaiphal
243.	*Horsfieldia irya* (Gaertn.)Warb.	T	Chooglum, Mutwinda
244.	*Hydnocarpus kurzii* (King) Warb.	S	Chaulmugra (Hindi)
245.	*Hymenodictyon excelsum* Wall.	T	Kukurkat, Bhaulan (Hindi)
246.	*Hyptis capitata* Jacq.	H	Kumtop (Nicobarese)
247.	*Hyptis rhomboidea* Mart. & Gal.	H	Jungli Buti
248.	*Ipomoea campanulata* L.	C	Lumtok (Nicobarese)
249.	*Ipomoea gracilis* R.Br.	C	Khari Bel, Palanchach(Nicobarese)
250.	*Ipomoea pes-caprae* (L.) Sweet.	C	Dopatilata (Hindi)
251.	*Ixora brunnescens* Kurz	T	Hamaok (Nicobarese)
252.	*Ixora grandifolia* Zoll. & Morr.	H	Sinkok (Nicobarese)
253.	*Jasminum multiflorum* (Burm.f.) Andr. var. *nicobaricum* Thoth.	C	Downy Jasmine, Chameli (Hindi)
254.	*Jasminum ritchiei* Cl. var. *purpurea* Cl.	C	Karumukai (Tamil)
255.	*Justicia gendarussa* Burm.f.	H	Nilinargandi (Hindi)
256.	*Knema andamanica* (Warb.) de Wilde ssp. *Andamanica*	T	Bara Patti Jaiphal
257.	*Knema cinerea* (Poir.) Warb. var. *andamanica* (Warb.) Sinclair	T	Bara Patti Jaiphal
258.	*Knema glaucescens* Jack.	T	Lal Jaiphal

259.	*Korthalsia laciniosa* Mart.	S	Lal Beth
260.	*Kyllinga nemoralis* (Forst.f.) Dandy ex Hutch. & Dalz.	H	Matha Grass
261.	*Lagerstroemia hypoleuca* Kurz	T	Pyinma
262.	*Lannea coromandelica* (Houtt.) Merr.	T	Nabbe
263.	*Lasianthus cyanocarpus* Jack.	T	Loi (Nicobarese)
264.	*Leea acuminata* Wall. ex Cl.	S	Hara Buti
265.	*Leea aequata* L.	S	Bhagora Balli
266.	*Leea grandifolia* Kurz	S	Takteyu (Nicobarese)
267.	*Leea indica* (Burm.f.) Merr.	S	Hara Buti
268.	*Laportea* sp.	S	Nettle
269.	*Licuala peltata* Roxb.	S	Selaipatti
270.	*Licuala spinosa* Wurmb.	S	Khari Selai Patti
271.	*Litsea amara* Bl.	T	Inmun
272.	*Litsea glutinosa* (Lour.) C.B. Robins.	T	Maida Lakri (Hindi)
273.	*Litsea salicifolia* Roxb.	S	Digloli (Assamese)
274.	*Lumnitzera littorea* (Jack.) Voigt	T	Kirma
275.	*Lumnitzera racemosa* Willd.	T	Gobra Khari
276.	*Lygodium flexuo-sum* (L.) Sw.	C	Vallipanna (Malayalam)
277.	*Macaranga indica* Wight	T	Kanhed (Nicobarese)
278.	*Macaranga peltata* Muell.-Arg.	T	Garparkash (Hindi)
279.	*Macaranga tanarius* (L.) Muell.-Arg.	T	Golpatti
280.	*Madhuca butyracea*	T	Hill Mahua
281.	*Maesa andamanica* Kurz	S	Lal Buti
282.	*Maesa indica* (Roxb.) A. DC.	S	Kirithi (Malayam)
283.	*Maesa ramentacea* (Roxb.) DC.	S	Hing-kwai (Nicobarese)
284.	*Mallotus philippensis* (Lam.) Muell.-Arg.	T	Khujli Balli,Rain
285.	*Mangifera andamanica* King	T	Jungli Aam
286.	*Mangifera camptosperma* Pierre	T	Nicobari Aam
287.	*Mangifera indica* L.	T	Aam
288.	*Mangifera sylvatica* Roxb.	T	Jungli Aam

289.	*Manilkara littoralis* (Kurz) Dub.	T	Khari Mahua
290.	*Melastoma malabathricum* L.	S	Tinrok(Nicobarese)
291.	*Memecylon edule* Roxb.	T	Iron Wood Tree
292.	*Merremia umbellata* (L.) Hall.f.	C	Japani Bel
293.	*Mesua ferrea* L.	T	Gangaw
294.	*Mikania cordata* (Burm.f.) Robinson	C	Kerela Bel
295.	*Miliusa tectona* Hutch. ex Parkinson	T	Jungli Sagwan
296.	*Millettia pachycarpa* Bethh.	C	Bishloti (Bengali)
297.	*Mimosa pudica* L.	H	Lajwanti
298.	*Mimusops elengi* Roxb.	T	Bakul
299.	*Mitragyna parvifolia* (Roxb.) Korth.	T	Karmi
300.	*Mitragyna rotundifolia* (Roxb.) Kuntze	T	Timi (Assamese)
301.	*Momordica charantia* L.	C	Karela (Hindi)
302.	*Morinda angustifolia* Roxb.	T	Jungli Khari
303.	*Morinda citrifolia* L.	T	Lurong (Nicobarese)
304.	*Mucuna gigantea* (Willd.) DC.	C	Koyan (Nicobarese)
305.	*Mucuna monosperma* DC.	C	The Negro Bean
306.	*Murraya koenigii* (L.) Spreng.	S	Jungli Karipatti
307.	*Murraya exotica* (L.) Jack.	T	Malai Lakri
308.	*Musa acuminata* Colla	H	Jungli Kela
309.	*Musa paradisiaca* L.	H	Hipuh
310.	*Mussaenda frondosa* L.	S	Bedina (Hindi)
311.	*Mussaenda macrophylla* Wall.	S	Tisoh (Nicobarese)
312.	*Myristica andamanica* Hk.f.	T	Jaiphal
313.	*Myristica prainii* King	T	Lal Jaiphal
314.	*Nagea wallichiana* (Presl) O. Kuntze	T	Naram Balli (Tamil)
315.	*Nauclea gageana*	T	Teinkala
316.	*Oldenlandia paniculata* L.	H	Daman-Tapra (Hindi)
317.	*Ophiopogon intermedius* D.Don	H	Pota Grass
318.	*Ophiorrhiza mungos* L.	H	Sarahati (Hindi)
319.	*Oplismenus compositus* (L.) Beauv.	H	Bamboo Grass

320.	*Orophaea hexandra* Bl.	T	Jungli Sarifa
321.	*Oroxylum indicum* (L.) Vent.	T	Phol Patti
322.	*Oryza indandamanica* Ellis	H	Jungli Dhan
323.	*Pajanelia rheedii* (Willd.) K.Schum.	T	Jhingam
324.	*Pandanus andamanensis* Kurz	T	Kasan
325.	*Pandanus leram Jones* ex Fontana var. *andamanensium* (Kurz) C.B. Stone	T	Nicobari Great Fruit
326.	*Pandanus tectorius* Soland. ex Park.	T	Keora
327.	*Paramignya andamanica* (L.) Tanaka	S	Nimbu Bel
328.	*Paramignya armata* (Thw.) Bedd. ex Oliv.	S	Ban-Nimbu (Bengali)
329.	*Parishia insignis* Hk.f.	T	Lal Dhup
330.	*Pavetta indica* L.	S	Kankra (Hindi)
331.	*Pavetta tomentosa* Roxb.	S	Kathachampa (Hindi)
332.	*Pericampylus glaucus* (Lam.) Merr.	C	Mangruan (Nicobarese)
333.	*Phoebe attenuata* Nees	T	Bonsun (Assamese)
334.	*Phoenix paludosa* Roxb.	T	Khari Khajur
335.	*Phragmites karka* Trin.ex Steud.	H	Narkul (Hindi)
336.	*Phrynium capitatum* Willd.	H	Chotta Patti Haldi
337.	*Phrynium paniculatum* Balakr.	H	Jungli Haldi
338.	*Phrynium placentarium* (Lour.) Merrill	H	Jungli Haldi
339.	*Phyllanthus amarus* Schum. &Thonn	H	Kin-pilaha-yoon (Nicobarese)
340.	*Phyllanthus gomphocarpus* Hk.f.	H	Pangtaront(Nicobarese)
341.	*Phyllanthus urinaria* L.	H	Hazaramani (Hindi)
342.	*Picrasma javanica* Bl.	T	Bonposhla (Assamese)
343.	*Pinanga kuhlii* Bl.	T	Kumba
344.	*Piper betle* L.	C	Jungli Pan
345.	*Piper longum* L.	C	Indian Long Pepper,Pipli
346.	*Piper nigrum* L.	C	Black Pepper,Kali Mirch
347.	*Pisonia umbellifera* (Frost.) Seem.	T	Baniya
348.	*Pithecellobium angulatum* Bethh.	T	Rasoon
349.	*Pithecellobium dulce* (Roxb.) Bethh.	T	Karkapilli (Tamil)

350.	*Planchonella longipetiolatum* (King & Prain) H.J.Lam.	T	Lamba Patti
351.	*Planchonella obovata* (R.Br.) Pierre	T	Makil (Nicobarese)
352.	*Planchonia andamanica* Bl.	T	Red Bombwe
353.	*Plecospermum andamanicum* King	C	Badmash Bel
354.	*Pluchea indica* (L.) Less.	H	Puheol (Nicobarese)
355.	*Podocarpus neriifolius* D.Don	T	Titmin
356.	*Polyalthia jenkinsii* (Hk.f.& Th.)	T	Kari Patti
357.	*Polyalthia parkinsonii* Hutch.	T	Jat Balli,Pahari Jaiphal
358.	*Polyalthia simiarum* Hk. f. & Thoms.	T	Kari
359.	*Polygala chinensis* L.	H	Meradu (Hindi)
360.	*Polygonum chinense* L.	S	Kelnap (Assamese)
361.	*Pometia pinnata* Forst.	T	Thitkandu
362.	*Pongamia pinnata* (L.) Pierre	T	Karanj
363.	*Pothos scandens* L.	C	Bichoo Bel,Pathar Bel
364.	*Prunus martabanica* Miq.	T	Putri, Red Thingan
365.	*Pseuderanthemum album* (Nees.) Merr.	T	Lanboh (Nicobarese)
366.	*Pseuduvaria prainii* (King) Merr.	T	Kebotileve (Onghe)
367.	*Psychotria adenophylla* Wall.	T	Safed Balli
368.	*Psychotria sarmentosa* Bl.	T	Milahan-ah (Nicobarese)
369.	*Pteris pellucida* Presl.	H	Putri,
370.	*Pterocarpus dalbergioides* Roxb.	T	Padauk
371.	*Pterocarpus indicus* Willd.	T	Malay Padauk
372.	*Pterocymbium tinctorium* (Bl.) Merr.	T	Papita
373.	*Pterospermum acerifolium* (L.) Willd.	T	Makchun
374.	*Pterygota alata* (Roxb.) R.Br.	T	Lakho
375.	*Quisqualis indica* L.	S	Rangoon Ki Bel (Hindi)
376.	*Randia andamanica* Balakr.	T	Mauna,Patmauna
377.	*Rhaphidophora laciniata* (Burm.f.) Merr.	C	Khus Bel
378.	*Rhizophora apiculata* Bl.	T	Kala Khari
379.	*Rhizophora mucronata* Lam.	T	Kala Khari

380.	*Rinorea bengalensis* (Wall.) O.Kuntz.	T	Jungli Chai
381.	*Rubus moluccanus* L.	S	Voknuto (Nicobarese)
382.	*Ryparosa javanica* (Bl.) Kurz ex Koord. & Val	T	Tavov (Nicobarese)
383.	*Saccharum arundinaceum* Retz.	H	Hathi Ghana
384.	*Sageraea elliptica* (A.DC.) Hk.f. & Thoms.	T	Chooi
385.	*Sageraea listeri* King var. *andamanica* Chatt. & Mukh.	T	Chooi
386.	*Salacia chinensis* L.	T	Saptarangi (Hindi)
387.	*Samanea saman* (Jacq.) Merr.	T	Jungli Siris, Too-no-ka (Nicobarese)
388.	*Sapium baccatum* Roxb.	T	Lelun (Andamanese)
389.	*Sarcolobus globosus* Wall.	C	Fonghanch (Nicobarese)
390.	*Sarcostigma kleinii* W. & A.	C	Ingudi
391.	*Sauropus macranthus* Hassk.	T	Hinkot (Nicobarese)
392.	*Scaevola sericea* Vahl	S	Taful (Nicobarese),Fan Flower
393.	*Schleichera oleosa* (Lour.) Oken.	T	Kusum (Hindi)
394.	*Scindapsus officinalis* (Roxb.) Schott	C	Hathi Bel
395.	*Scleria terrestris* (L.) Fass.	H	Chichora (Hindi)
396.	*Scoparia dulcis* L.	H	Jastimadhu (Santal)
397.	*Semecarpus kurzii* Engler	T	Bhelwa
398.	*Semecarpus prainii* King	T	Jungli Kaju
399.	*Sida acuta* Burm.f.	H	Inmeui-ta-meu-yo (Nicobarese)
400.	*Sideroxylon longepetiolatum*	T	Lambapathi
401.	*Smilax lanceifolia* Roxb.	C	Chobchini (Hindi)
402.	*Smilax odoratissima* Bl.	C	Khujli Bel,Rampawani Bel
403.	*Smilax zeylanica* L.	C	Jungli Aushbah (Hindi)
404.	*Sonneratia alba* Smith	T	Urava (Oriya)
405.	*Sophora tomentosa* L.	S	Patangkul (Nicobarese)
406.	*Sphaeropteris albo-setacea* (Bedd.) Tryon	T	Tree Fern
407.	*Spondias pinnata* (L.f.) Kurz	T	Amra,Ambara,Gwe
408.	*Stachytarpheta indica* (L.) Vahl	H	Katapanuttu (Malayalam)

409.	*Stachytarpheta jamaicensis* (L.) Vahl	H	Karyartharani (Hindi)
410.	*Stephania corymbosa* Miq.	C	Bargi
411.	*Stephania japonica* (Murr.) Miers var. *discolor* (Miq.) Forman	C	Tape-Vine
412.	*Sterculia guttata* Roxb.	T	Kitholndi (Malayam)
413.	*Sterculia parviflora* Roxb.	T	Karmi
414.	*Sterculia rubiginosa* Vent.	T	Lal Chilka,Fuk (Nicobarese)
415.	*Sterculia villosa* Roxb.	T	Lal Chilka
416.	*Streblus asper* Lour.	T	Khaksi
417.	*Streblus taxoides* (Roth) Kurz	S	Amne
418.	*Striga lutea* Lour.	H	Agia
419.	*Strobilanthes andamanensis* Bor	H	Chorai Gohra
420.	*Strobilanthes glandulosus* Kurz	H	Charigarua
421.	*Strychnos andamanensis* Hill	C	Insot (Nicobarese)
422.	*Strychnos minor* Dennst.	C	Kanta Bel
423.	*Strychnos wallichiana* Steud. ex DC.	C	Mirchi
424.	*Symplocos racemosa* Roxb.	T	Lodh (Hindi)
425.	*Syzygium andamanicum* (King) Balakr.	T	Jungli Amrood
426.	*Syzygium cuminii* (L.) Skeels	T	Jamun
427.	*Syzygium manii* (King) Balakr.	T	Jungli Amrood
428.	*Syzygium samarangense* (Bl.) Merr. & Perry	T	Jungli Jamun
429.	*Syzygium zeylanica* (L.) DC.	T	Marungi (Tamil)
430.	*Tabernaemontana crispa* Roxb.	T	Koraya
431.	*Tacca leontopetaloides* (L.) Kuntz.	H	Saunch (Nicobarese)
432.	*Tectona grandis* L.f.	T	Teak
433.	*Terminalia bialata* Steud.	T	White Chuglam
434.	*Terminalia catappa* L.	T	Badam
435.	*Terminalia citrina* (Gaertn.) Roxb.	T	Harira (Hindi)
436.	*Terminalia mannii* King	T	Black Chuglam
437.	*Terminalia procera* Roxb.	T	White Bombwe
438.	*Tetrameles nudiflora* R. Br.	T	Teepok, Thitpok

439.	*Tetrastigma lanceolarium* (Roxb.) Planch.	C	Tinfuk (Nicobarese)
440.	*Thespesia populnea* (L.) Solkand ex Corr.	T	Khari Kapas
441.	*Thunbergia fragrans* Roxb.	C	Noorvanvali (Malaylam)
442.	*Thunbergia laurifolia* Lindl.	C	Chuti Bel
443.	*Thysanolaena maxima* (Roxb.) Kuntz.	H	Broom Grass,Phuljanta (Bengali)
444.	*Tinospora cordifolia* (Willd.) Miers ex Hk.f. & Thoms.	C	Amrita,Gulancha (Hindi)
445.	*Trema ambionensis*	T	Bakripatti
446.	*Trema orientalis* Bl.	T	Gio (Hindi)
447.	*Triumfetta rhomboidea* Jacq.	H	Chikti (Hindi)
448.	*Tylophora indica* (Burm.f.) Merr.	C	Antamul (Hindi)
449.	*Uraria picta* (Jacq.) Desv.ex DC.	H	Dabar (Hindi)
450.	*Urena lobata* L.	S	Pithia (Hindi)
451.	*Ventilago maderaspatana* Gaertn.	C	Pitti (Hindi)
452.	*Vernonia cinerea* (L.) Less.	H	Daudotpala (Hindi)
453.	*Vitex peduncularis* Wall. ex Schauer var. *roxburghiana* Clarke	S	Nagbail(Hindi)
454.	*Wedelia biflora* (L.) DC.	H	Hawai Buti
455.	*Xanthophyllum andamanicum* King	T	Letphew
456.	*Xylocarpus granatum* Koenig.	T	Khari Sundri
457.	*Zanthoxylum ovalifolium* Wt.	S	Armadalu (Kannada)
458.	*Zanthoxylum budrunga (Wall)*	T	Mayanin
459.	*Ziziphus glabra* Roxb.	S	Karkala (Malayalam)
460.	*Ziziphus mauritiana* Lam.	S	Ber, Baer (Hindi)
461.	*Ziziphus oenoplia* Mill	C	Makai (Hindi)
462.	*Ziziphus rugosa* Lam.	S	Churna (Hindi)
* Most of this vernacular names were noted during field trip from forest field staff (mostly from Ranchi). Rest of the names were taken from different literature.			

C = Climber H = Herb S = Shrub T = Tree

COMMERCIAL & MISCELLANEOUS TIMBER SPECIES

I COMMERCIAL

I (A) ORNAMENTAL WOODS

Vernacular Name	Scientific Name
1. Chooi	*Sageraea elliptica*
2. Marble wood	*Diospyros marmorata*
3. Padauk	*Pterocarpus dalbergioides*
4. Satin wood	*Murraya exotica*
5. Silvergrey	*Terminalia bialata*
6. Teak	*Tectona grandis*

I (B) HARD WOODS

1. Badam	*Terminalia procera*
2. Black chuglam	*Terminalia manii*
3. Chakrisia	*Chukrasia tabularis*
4. Gangaw	*Mesua ferrea*
5. Gurjan	*Dipterocarpus* spp.
6. Hill mahua	*Madhuca butyracea*
7. Jhingam	*Pajanelia rheedii*
8. Jungli aam	*Mangifera andamanica*
9. Koko	*Albizzia lebbek*
10. Lakuch	*Artocarpus gomeziana*
11. Lalchini	*Amoora wallichii*
12. Lal bombwe	*Planchonia andamanica*
13. Mau	*Duabanga soneratioides*
14. Nabbe	*Lannea coromandelica*
15. Poon	*Calophyllum inophyllum*
16. Pyinma	*Lagerstroemia hypoleuca*
17. Red thingan	*Prunus martabanica*
18. Red dhup	*Parishia insignis*
19. Sea mohwa	*Manilkara littoralis*
20. Toungpinne	*Artocarpus chaplasha*
22. Teinkala	*Nauclea gageana*
23. White thingan	*Hopea odorata*
24. White chuglum	*Terminalia bialata*
25. Ywegi	*Adenanthera pavonina*

andamanicum

I (C) SOFT WOODS

Vernacular Name	Scientific Name
1. Ailanthus	*Ailanthus kurzii*
2. Bakota	*Endospermum chinense*
3. Bombeza	*Albizzia stipulata*
4. Didu	*Bombax insigne*
5. Evodia	*Evodia glabra*
6. Letkok	*Sterculia alata*
7. Lambapatti	*Sideroxylon longepetiolatum*
8. Myanin	*Zanthoxylum rhetsa*
9. Papita	*Pterocymbium tinctorium*
10. Thitpok	*Tetrameles nudiflora*
11. White dhup	*Canarium euphyllum*
12. Red Dhup	*Parishia insignis*
13. Kadam	*Anthocephalus cadamba*

II MISCELLANEOUS SPECIES

II (A) HARDWOOD

1. Ambara	*Spondias mangifera*
2. Chinyok	*Dracantomalum mangifera*
3. Gular	*Ficus* spp.
4. Jamun	*Syzyigium* spp.
5. Jangli lakuch	*Antiaris toxicaria*
6. Jungli neem	*Ganophyllum falcatum*
7. Karanj	*Pongamia pinnata*
8. Letauk	*Aglaia andamanica*
9. Thitkandu	*Pometia pinnata*
10. Sambium	*Dillenia* spp.
11. Siris	*Enterolobium saman*

II (B) SOFTWOOD

1. Bakripatti	*Trema ambionensis*
2. Jaiphal	*Myristica* spp.
3. Khattaphal	*Baccaurea sapida*
4. Korkot	*Dillenia pentagyna*
5. Lal chilka	*Sterculia villosa*
6. Lephew	*Xanthophyllum*

ENDEMIC SPECIES OF A & N ISLANDS

DICOTYLEDONS

Acanthaceae:	
1) *Hypoestis andamanensis*	2) *Hypoestis thothathrii*
3) *Rostellularia andamanica*	4) *Strobilanthes andamanensis*
5) *Strobilanthes glandulosus*	
Anacardiaceae:	
1) *Buchanania splendens*	2) *Mangifera andamanica*
3) *Semecarpus kurzii*	4) *M. nicobarica*
Annonaceae:	
1) *Artabotrys nicobarianus*	2) *Friesodielsia khoshooii*
3) *Miliusa andamanica*	4) *Orophaea katschallica*
5) *Orophaea salacifolia*	6) *Orophaea torulosa*
7) *Polyalthia parkinsonii*	8) *Popowia parvifolia*
9) *Pseuduvaria prainii*	10) *Sagaraea listeri*
11) *Uvaria andamanica*	12) *Uvaria hamiltonii*
13) *Uvaria nicobarica*	14) *Miliusa jainii*
Memecylaceae:	
1) *Memecylon andamanicum*	2) *Memecylon coeruleum var. pulchrum*
3) *Memecylon collinum*	4) *Memecylon elegans*
Menispermaceae:	
1) *Cyclea pendulina*	2) *Stephania andamanica*
3) *Tinomiscium petiolare*	4) *Tinospora andamanica*
Moraceae:	
1) *Ficus andamanica*	
Myristicaceae:	
1) *Horsfieldia macrocarpa var. canaroides*	2) *Knema andamanica spp. andamanica*
3) *Myristica andamanica*	
Myrsinaceae:	
1) *Ardisia andamanica var.*	2) *Embelia microcalyx*

effuse	
3) *Maesa andamanica*	4) *Maesa andamanica var. longipedicellata*
Myrtaceae:	
1) *Cleistocalyx nicobaricus*	2) *Syzygium andamanicum*
3) *Syzygium kurzii var. andamanica*	4) *Syzygium manii*
Olacaceae:	
1) *Olax imbricata var. membranifolia*	
Oleaceae:	
1) *Chionanthus parkinsonii*	2) *Jasminum andamanicum*
3) *Jasminum cordifolium ssp. andamanicum*	4) *Jasminum multiflorum var. nicobaricum*
5) *Jasminum balakrishnanii*	
Passifloraceae:	
1) *Adenia heterophylla ssp. andamanica*	
Verbenaceae:	
1) *Clerodendrum lankawiense var. andamanense*	2) *Vitex diversifolia*
3) *Vitex wimberleyii*	
Violaceae:	
1) *Rinorea heteroclita*	
Vitaceae:	
1) *Tetrastigma andamanica*	2) *Leea grandifolia*
Xanthophyllaceae:	
1) *Xanthophyllum andamanicum*	
MONOCOTYLEDONS	
Agavaceae:	
1) *Dracaena brachyphylla*	
Amaryllidaceae:	
1) *Crinum pusillum*	
Araceae:	
1) *Aglaonema nicobaricum*	2) *Amorphophallus carnosus*

3) *Amorphophallus longistylus*	4) *Amorphophallus oncophyllus*
5) *Arisaema saddlepeakense*	
Arecaceae:	
1) *Bethinckia nicobarica*	2) *Calamus andamanicus*
3) *Calamus dilaceratus*	4) *Calamus nicobaricus*
5) *Calamas pseudorivalis*	6) *Calamus uniforms*
7) *Calamus viminalis var. andamanicus*	8) *Daemonorops kurzianus*
9) *Daemonorops manii*	10) *Korthalsia rogersii*
11) *Pinanga andamanensis*	12) *Pinanga manii*
13) *Rhopaloblaste angustata*	
Cyperaceae:	
1) *Cyperus Kurzii*	2) *Hypolytrum balakrishnanii*
Dioscoreaceae:	
1) *Dioscorea rogersii*	2) *Dioscorea vexans*
Marantaceae:	
1) *Phrynium paniculatum*	2) *Stachyphrynium cadellianum*
Orchidaceae:	
1) *Aerides emericii*	2) *Anoectochilus nicobar*
3) *Bulbophyllum protractum*	4) *Dendrobium gunnarii*
5) *Dendrobium tenuicaule*	6) *Eria andamanica*
7) *Eria bractescens var. kurzii*	8) *Eulophia nicobarica*
9) *Habenaria andamanica*	10) Malaxis andamanica
11) *Malleola andamanica*	12) *Phalaenopsis speciosa*
13) *Phalaenopsis speciosa var. Christiana*	14) *Phalaenopsis speciosa var. imperatrix*
15) *Phalaenopsis speciosa var. tetraspis*	16) *Poaephyllum nicobaricum*
17) *Pomatocalpa andamanicum*	18) *Pteroceras alatum*
19) *Pteroceras muriculatum*	20) *Smitinandia helferi*
21) *Taeniophyllum andamanicum*	22) *Trichoglottis orchidea*

23) *Vanilla andamanica*	24) *Zeuxine andamanica*
25) *Zeuxine rolfiana*	
Ranunculaceae:	
1) *Clematis smilacifolia ssp. andamanica*	
Rhamnaceae:	
1) *Gouania andamanica*	
Rubiaceae:	
1) *Aidia forbesii*	2) *Argostemma sonnertioides*
3) *Canthium gracilipes*	4) *Diplospora andamanica*
5) *Hedyotis andamanica*	6) *Hedyotis congesta var. nicobarica*
7) *Hedyotis paradoxa*	8) *Hydnophytum andamanensis*
9) *Ixora andamanica*	10) *Ixora barbata*
11) *Ixora brunnescens*	12) *Ixora capituliflora*
13) *Ixora cuneifolia var. macrocarpa*	14) *Ixora finlaysoniana*
15) *Ixora hymenophylla*	16) *Ixora grandifolia* Var*. rosella*
17) *Ixora ternuifolia*	18) *Ixora longibracteata*
19) *Ixora multibracteata*	20) *Ixora nicobarica*
21) *Coptophyllum nicobaricum*	22) *Lasianthus andamanicus*
23) *Neonauclea gigantea*	24) *Neonauclea nicobarica*
25) *Ophiorrhiza infundibularis*	26) *Ophiorrihiza nicobarica*
27) *Psychotria andamanica*	28) *Psychotria balakrishnanii*
29) *Psychotria helferi var. angustifolia*	30) *Psychotria kurzii*
31) *Psychotria nicobarica*	32) *Psychotria pendula*
33) *Psychotria platyneura*	34) *Psychotria tylophora*
35) *Pubistylus andamanensis*	36) *Randia andamanica*
37) *Rothmannia pulcherrima*	38) *Tarenna weberaefolia*
39) *Urophyllum andamanicum*	40) *Wendlandia andamanica*
Rutaceae:	
1) *Aphananthe lucida*	2) *Citrus nobilis var. limonellus*
3) *Glycosmis mauritiana var. andamanensis*	4) *Glycosmis mauritiana var. insularis*

5) *Glycosmis pilosa*	6) *Paramignya andamanica*
7) *Zanthoxylum andamanicum*	
Santalaceae:	
1) *Henslovia erythrocarpa*	
Sapindaceae:	
1) *Allophyllus subfalcatus var. acutissimus*	2) *Lepidopetalum jackinamum*
3) *Lepisanthes andamanica*	
Sapotaceae:	
1) *Diploknema butyracea var. andamanensis*	2) *Manilkara littoralis*
3) *Mimusops andamanensis*	4) *Planchonella kingiana*
5) *Planchonella kingiana var. andamanica*	
Scrophulariaceae:	
1) *Cyrtandroemia nicobarica*	2) *Limnophila chinensis var. scaberrima*
Sterculiaceae:	
1) *Sterculia rubiginosa var. glaberoescens*	
Thymelaceae:	
1) *Enkleia andamanica*	
Tiliaceae:	
1) *Grewia calophylla*	
Urticaceae:	
1) *Elatostemma novorae*	2) *Pellionia procridifolia*

(Source: Rao, 1996)

PHOTOS

Plate-1

INAUGURATION OF PHASE-I

Plate-2

VISITOR AMENITIES AND SIGNAGE

Plate -3

VISITORS AMENITIES & SIGNAGES

Plate -4

ENCLOSURES

Breeding population

Andaman Wild Pig Breeding

Saltwater Crocodile Breeding

Common Rose Atrophaneura aristolochiae (Fabricius)

Andaman Viscount Tanaecia cibaritis Hewitson

Clipper Parthenos sylvia (Cramer)

Lime Butterfly Papilio demoleus (Linnaeus)

Tailed jay Graphium agamemnon (Linnaeus)

Peacock Pansy Junonia almana (Linnaeus)

Plate: Butterflies of Chidiyatappu Biological Park

Andaman Mormon *Papilio mayo*

Leomon Pansy *Junonia lemonias*

White banded awl *Hasora taminatus*

Stripped Tiger Danaus genutia Cramer

Common albatross Appias albino (Linnaeus)

Common Birdwing *Troides helena*

Plate: Butterflies of Chidiyatappu Biological Park

White-headed Starling
Sturnus erythropygius (Blyth)

Pompadour Green Pigeon
Treron pompadora chlorptera Blyth

Nicobar Pigeon *Caloenas nicobarica* (Linnaeus)

Orange Headed Thrush *Zoothera citrina* (Latham)

Blacknaped Monarch
Hypothymis azurea (Boddaert)

Andaman Red-breasted Parakeet
Psittacula alexandri (Linnaeus)

Plate: Birds of Chidiyatappu Biological Park

Andaman Black-naped Oriole
Oriolus chinensis andamansis Tytler

Common Hill-Myna
Gracula religiosa Linnaeus

Eurasian Golden Oriole
Oriolus oriolus (Linnaeus)

White-bellied Sea-eagle
Haliaeetus leucogaster (Gmelin)

Oriental Broad-billed Roller
Eurystomus orientalis (Linnaeus)

Andaman Coucal
Centropus andamanensis Beavan

Plate: Birds of Chidiyatappu Biological Park