

**BIODIVERSITY CONSERVATION METHODS  
IN  
VISAKHAPATNAM**

**Dr. V.S.KRISHNA GOVERNMENT DEGREE COLLEGE(A),  
VISAKHAPATNAM**

**DEPARTMENT OF BOTANY**



**STUDENT STUDY PROJECT**

## CERTIFICATE

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# Biodiversity





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## AIMS AND OBJECTIVES

To learn about the importance of conservation of Bio-Diversity.

To learn about the forest conservative methods followed by the Department of Forest

To learn about the Bio diversity conservative methods of Marine ecosystem

To learn about the Bio diversity park and its Maintenance

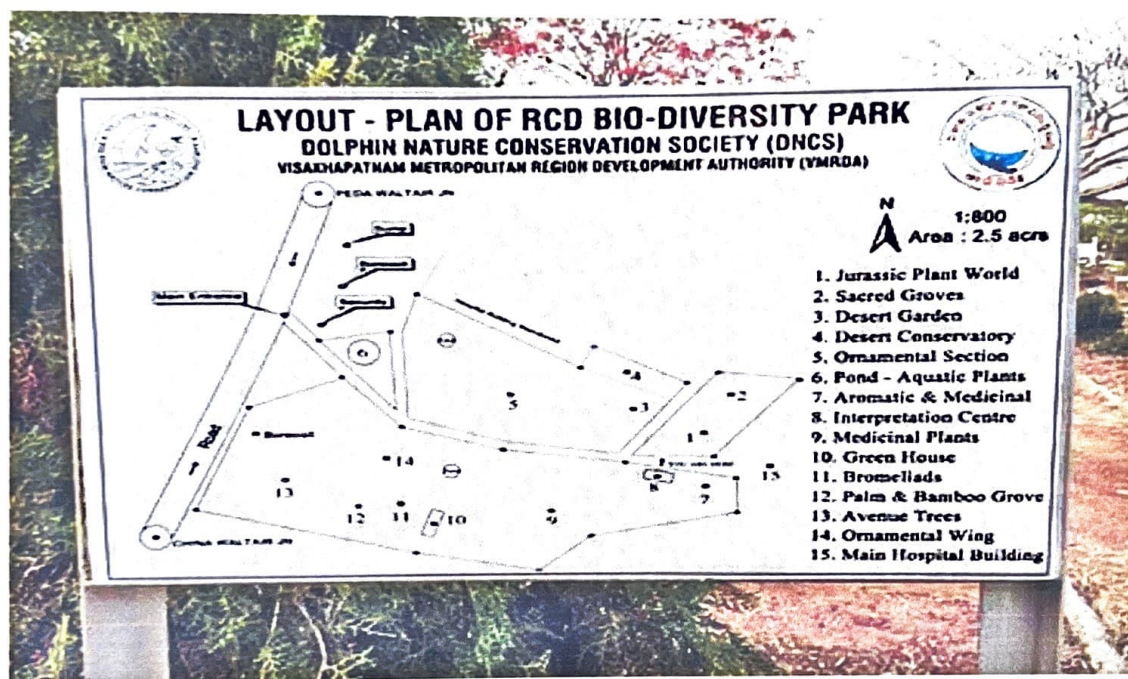
To learn about the Ex-situ and In-situ conservative methods followed in Visakhapatnam

# BIODIVERSITY-CONSERVATION METHODS IN VISAKHAPATNAM

## INTRODUCTION :

Biodiversity or biological diversity is the variety and variability of life on Earth. Biodiversity is a measure of variation at the genetic (genetic variability), species (species diversity), and ecosystem (ecosystem diversity) level.

Biodiversity is all the different kinds of life you'll find in one area—the variety of animals, plants, fungi, and even microorganisms like bacteria that make up our natural world. Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life.



## BIODIVERSITY PARK, VISAKHAPATNAM

**Biodiversity Park, Visakhapatnam**, is a botanical garden, an ex situ conservation park, first of its kind in Visakhapatnam, Andhra Pradesh, India. The park is located in the premises of the Rani Chandramani Devi Government Hospital. It extends over 3 acres (1.2 ha).

Dolphin Nature Conservation Society (DNCS), Visakhapatnam, a registered, eco-friendly, non-government organization, has maintained it for 13 years and is now maintaining it in collaboration with the hospital and Visakhapatnam Metropolitan Region Development Authority.



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The park was inaugurated on 5 June 2002. This park has more than 2,000 species of plants. and has recorded visits by 60 species of birds and 105 species of butterflies. The park has become a "living laboratory" for education, awareness and research for students, and botanists, zoologists and researchers.

### Zones

The park has 10 major zones:

Sacred Groves

Living Fossil plants of Jurassic times (Gymnosperms)

Cacti and Succulents

Ornamental Plants

Aquatic Plants

Medicinal or Herbal and Aromatic Plants

Insectivorous Plants

Orchids

Ferns

Bamboo and Palm Groves

These sections harbour very rare and endangered species like maidenhair tree (Ginkgo biloba) and botanical oddities or curiosities like Krishna's butter cup, holy cross, Jesus smile, autograph tree, upside-down tree, Mickey Mouse tree, laughing Buddha bamboo, octopus tree. It has a 'green house or polynetted house', 'pond', 'cactus & succulent conservatory'. The society started a interpretation-cum-training centre, to conduct workshops and training programs.

### Plants

The Biodiversity Park contains the following groups of plant:

**Sacred plants of Sacred Groves zone:** Sacred groves section harbors plant species related to Ganesha worship (21 plants), Nakshatra vanam / birth stars or star constellations (27 plants), Raasivana / Zodiac signs (12 plants), Saptharishivana / 7 Indian sages garden (7 plants) and Navagraha vana (9 plants).

**Medicinal / Herbal and Aromatic:** Nearly 500 species of Medicinal plants or Medicinal herbs, including Pterocarpus santalinus, Santalum album, Gloriosa superba, Rauvolfia serpentina, Gymnemasylvestre, Costus igneus.

**Ornamentals:** Over 200 varieties, such as Couroupitaguianensis, Passiflora, Acalypha hispida, Clerodendrum incisum, Clerodendrum thomsoniae, James Bond 007, Ochna serrulata.

**Cacti:** Nearly 100 varieties, including Golden Barrel cactus Echinocactus grusonii, Rubyball cactus Gymnocalycium mihanovichii



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**Succulents:** 300 varieties, including *Lithops* spp.

**Aquatic plants:** Over 50 species, including *Victoria amazonica*. Some other examples are: Lilies, Lotus, *Equisitum*, *Vallisneria*, *Hydrilla*, *Potamogeton*. The park has mangrove plants like *Avicennia marina* with respiratory roots or pneumatophores, Sea brites, *Acanthophyllum* etc.

**Bromeliads:** 15 species of bromeliads are cultivated, including plants that live on air  
ex: *Tillandsia*.

**Ferns:** Species cultivated include *Nephrolepis* (Swordfern), *Asplenium nidus* (Bird's nest fern), *Pteris*, *Polypodium*, *Asplenium hemionitis* – Star Fern  
(*Notholaenaceae*), *Hemionitis arifolia* – Heart Fern (*Notholaenaceae*).

**Insectivorous plants:** *Nepenthes* (Pitcher plant).

**Bamboo Grove:** 5 species of bamboo are seen, including Laughing Buddha bamboo *Bambusa ventricosa*, Golden bamboo, Green bamboo.

**Palm Grove:** Over 25 species, including *Wodyetia bifurcata*, *Caryota urens*, *Hyophorba belagicaulis*, *Cyrtostachys renda*

**Arboretum:** This includes over 200 native and exotic tree species.

### Birds

60 species of birds have been recorded in the park, including Golden-backed woodpecker, Spotted owl, Parakeets, Brahminy starling, Greater Coucal, Red-whiskered bulbul, Purple sunbird and Barn owl.

### Butterflies

More than 100 species belonging to 6 families were observed in the Eastern Ghats Forests and Urban Environments of Visakhapatnam District, of which the family Papilionidae is represented by more than 10 species, Pieridae with more than 20 species, Nymphalidae with more than 30 species, Lycaenidae with more than 20 species, Riodinidae with 1 species and Hesperidae with more than 10 species. Some species of male butterflies ex. crows n tigers show interesting mechanism called clustering. During monsoon months, males congregate around some species of plants like *Crotalaria retusa*, *Heliotropium indicum* to suck some alkaloids or sex pheromones which are essential for mating.





### **Cyclone Hudhud**

In October 2014 Cyclone Hudhud caused extensive damage and loss of life in eastern India and Nepal. The entire park was severely damaged and almost became like a graveyard; almost all tree species were uprooted, fences destroyed, and the pond, greenhouse and cacti house collapsed. The park was rejuvenated within a span of one year by student volunteers with government support.

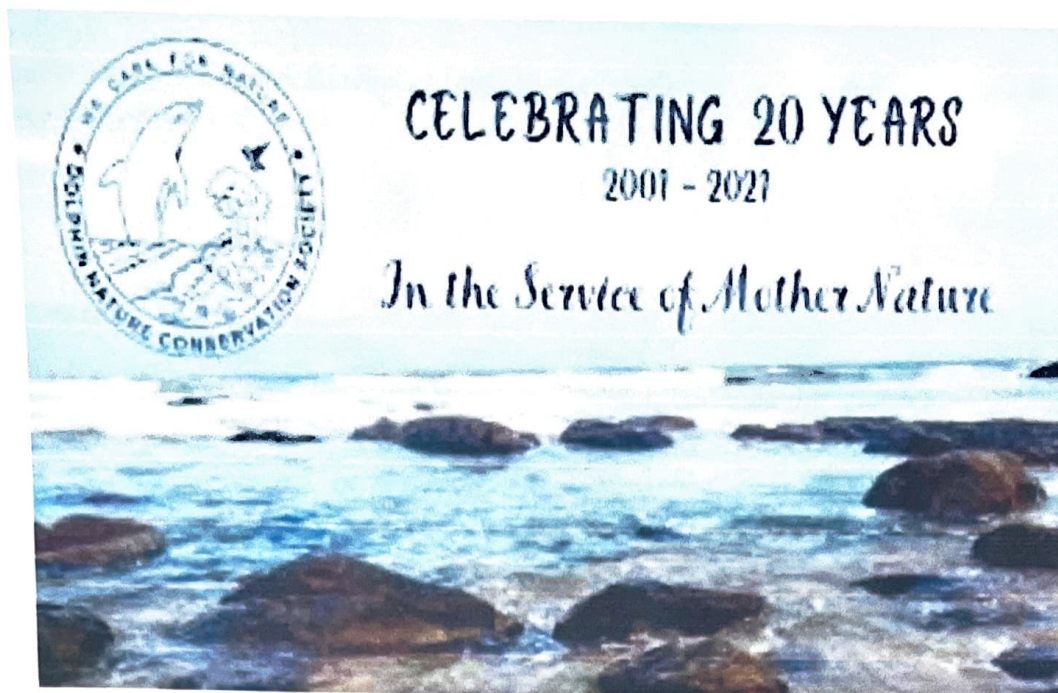
### **Awards**

The Dolphin Nature Conservation Society (DNCS) received two Andhra Pradesh Government state level awards for the development and maintenance of Biodiversity Park, Visakhapatnam.

### **DOLPHIN NATURE CONSERVATION SOCIETY**

The Dolphin Nature Conservation Society (DNCS) is a registered (no. 507/2001) voluntary environmental non-profit and non-governmental organization (NGO) located in Visakhapatnam, Andhra Pradesh, India. It is committed to the causes of nature conservation, environmental protection, research, education, and awareness. The society was founded on March 5, 2001, by Dr. Mantha Rama Murty and Dr. Mangathayi, who had previously launched several nature conservation programs in Andhra Pradesh, particularly in Visakhapatnam. The organization's activities are intended to instill a love for nature and conservation among people, especially among the younger generation. Notable research, documentation, conservation, and awareness campaigns of the society have involved Olive-Ridley Sea Turtles, intertidal rocky shore fauna and flora of the Visakhapatnam coast, and butterflies of the Eastern Ghats. The society's flagship project is the development and maintenance of the Biodiversity Park in Visakhapatnam.





### **Precursor: Penguin Nature Club (WWF-India)**

In 1987, an environmental organization known as the Penguin Nature Club was formed at the BVK College (part of Andhra University, Visakhapatnam) in affiliation with WWF-India. The organization engaged in nature conservation and environmental protection activities for more than a decade. Seeking to expand its activities, the organization was renamed the Dolphin Nature Conservation Society in 2001 and allowed public and student membership.

### **Awareness campaigns**

Society has conducted various educational nature conservation and environmental protection activities and campaigns. One notable example was a campaign dedicated to dispelling myths and misconceptions about snakes. It was emphasized that the majority of snakes are non-venomous and play an important role in the ecosystem by controlling the rodent population. In collaboration with the Friends of Snakes Society, Hyderabad, the society conducted live snake awareness programs in schools and colleges in Visakhapatnam. Other notable activities include campaigns against the use of thin plastic carry bags, zoo patrolling teams aimed at educating visitors about proper zoo visitation protocol, wildlife conservation projects, tree planting projects, and "save our beaches" anti-pollution campaigns.

### **Butterflies of the Eastern Ghats**

More than 100 species of butterflies belonging to six families were recorded by the society in the Eastern Ghats forests (Chintapalle, G K Veedhi, Ananthagiri, Paderu, Araku Valley, Sileru), and urban environments (Thotala Konda, Kambala Konda, Simhachalam Hills, Indira Gandhi Zoological Park, and RCD Biodiversity Park) of the Visakhapatnam district. The families included Papilionidae (swallowtails), Pieridae (whites) and



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yellows), Nymphalidae (brush-footed butterflies), Lycaenidae, Riodinidae (metalmarks/Punches and Judies), and Hesperidae (skippers)

### **Awards**

Andhra Pradesh Green Awards 2017 - APUG & BC 13-7-2018.

Andhra Pradesh Biodiversity Conserver Award - 2018 APSBDB 22-5-2018.

Rolling Shield (State Level) for Environmental Protection by the Directorate of Field Publicity, Ministry of Information & Broadcasting, Govt. of India, Hyderabad.

Best nature club of the Millenium-2000 by WWF-India, Hyderabad state office.

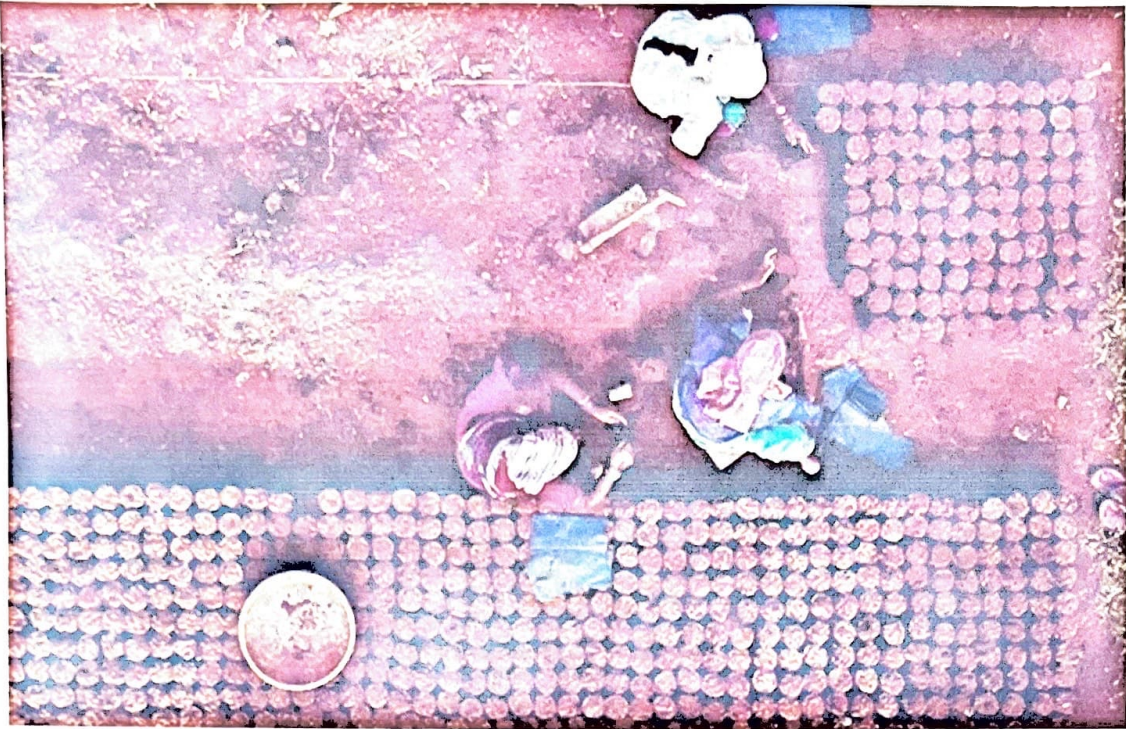
Best Environmental Society award in 2001 by Krushi Orthopaedic Society, Visakhapatnam, AP.

### **MISSION CONSERVE EASTREN GHATS**

The Vizag District Forest Department has launched the 'Conserve Eastern Ghats Mission' on the occasion of the International Day for Biological Diversity. Ideated by the District Forest Officer (DFO), Anant Shankar IFS, with the objective of conserving the greenery and biodiversity of the Eastern Ghats, the mission will take up several objectives to achieve the set goals. A special poster of the 'Conserve Eastern Mission Ghats' was unveiled by Peddireddy Ramachandra Reddy, Hon'ble Minister for Energy, Forest, Environment, Science & Technology and Mines & Geology in the presence of several district officials in Vizag.

A biodiversity centre will be set up at the Kambalakonda Wildlife Sanctuary in collaboration with the Dolphin Nature Conservation Society. This centre is proposed to be all-encompassing with the establishment of an arboretum, Ficus grove, Bambusetum, medicinal plants garden, herbal garden, Orchidarium, and Butterfly garden. An interpretation centre for a better understanding of Eastern Ghats and its rich biodiversity is also proposed at the site. Once developed, this will be the first such centre in the state of Andhra Pradesh and a major tourism spot in the city of Visakhapatnam.





Several plantation drives will be conducted to face the threat of high temperature and pollution levels in the city and to ensure effective carbon sequestration. Proper remedial actions will be taken by the department to conserve the flora and fauna of the Eastern Ghats with the aid of the Botanical Survey of India, Wildlife Institute of India, Andhra University, and others. *Wrightia Tinctoria*, locally known as Ankudu, is a tree species that will be planted to aid the craftsmen of Etikoppaka, a village famously known for its wooden toys and idols.





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A Non-Timber Forest Produce (NTFP) processing centre is also proposed, which focuses on jackfruit, tamarind, Aaonla (Usiri), and Bel (Maredu) based products. With an aim to eliminate single-use plastics, plates and bowls.

### **WILD LIFE AT CONSERVATION ZOO**

VISHAKHAPATNAM ZOO PARK SUCCESSFULLY ORGANIZED 'WILDLIFE WEEK 2023'



In an effort to raise awareness about wildlife conservation and celebrate the rich biodiversity of our planet, Indira Gandhi Zoological Park, Visakhapatnam organized a series of engaging and informative events during 69th Wildlife Week from October 2-8.

The week-long celebration saw enthusiastic participation from people of all ages, with approximately 1500 participants taking part in various activities aimed at connecting people with nature and fostering a love for wildlife.

The events, organized by Vizag Zoo in collaboration with various nature enthusiasts and environmental organizations, were designed to provide both entertainment and education to the participants. Drawing Competition, Tide Pool, Bird Walk, Photography Competition, Nature Trail, Fancy Dress, Herbarium Treasures, Forest Exploration

Walk and many other interesting and informative programs and competitions held for different age groups with different themes. Through these events children and adults showcased their talent, enjoyed and explored the mesmerizing world of tide pools and journey through the zoo's lush surroundings gives a different experience to all the participants.

## INDIAN WILDLIFE AND CONSERVATION STATUS FISHES OF RIVER SARAYU

A report on the status of the fish fauna and their conservation status of a river in the state of Andhra Pradesh, India with an emphasis on the conservation of endangered species and their conservation.





Today, October 7th, Fancy Dress competition has been conducted to the kids with the theme of Plants and animals of IGZP. Creative and imaginative costumes added an element of fun and whimsy to the celebrations, allowing participants to embody their favourite wildlife characters.

These events, irrespective of age, brought people together to appreciate the natural world and its importance in our lives. Wildlife Week served as a platform to encourage individuals to take an active interest in wildlife conservation and environmental protection. Vizag Zoo extends its heartfelt gratitude to all the participants, volunteers, and partners who made Wildlife Week a success.

By fostering a deeper connection with wildlife and nature, we hope to inspire a collective commitment to safeguarding our planet's invaluable biodiversity. And also IGZP conducting Half Marathon Run on October 8th, 2023 in association with Visakha Trail Running Association (VTRA). Around 400 participants registered for the run.

### **BIODIVERSITY AND CONSERVATION STATUS FISHES OF RIVER SARADA,VISAKHAPATNAM**

A survey was conducted on biodiversity of fish fauna and their conservation status of a freshwater river, Sarada in Visakhapatnam District of Andhra Pradesh, India with an objective to make a complete inventory of freshwater fishes and assess their conservation

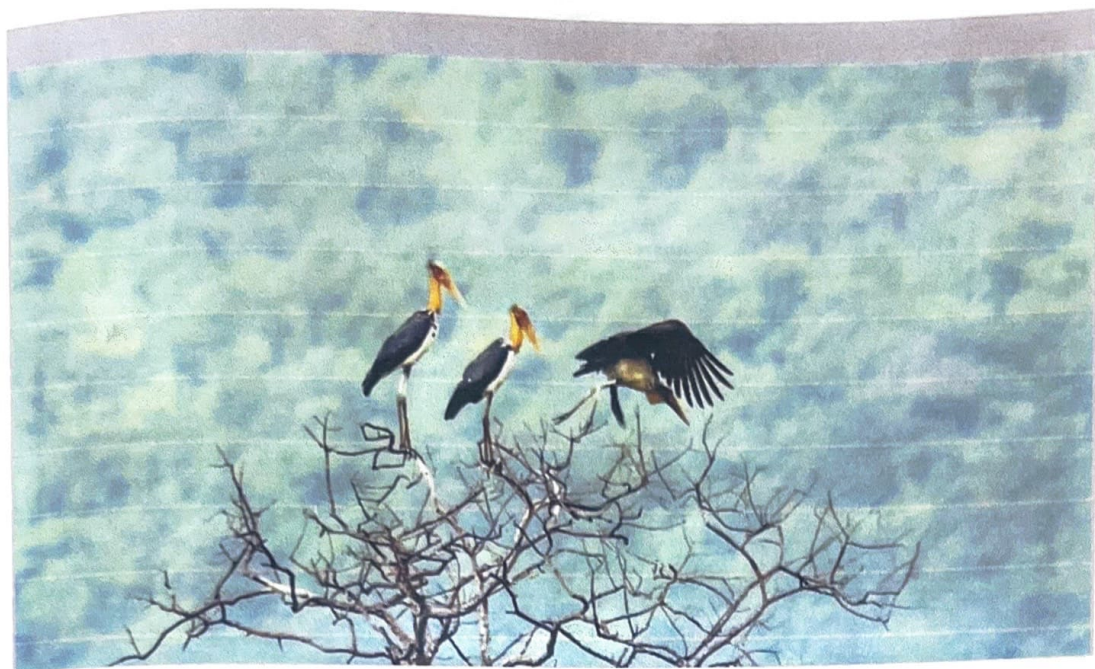




status. Regular bimonthly sampling was conducted from January, 2011 to December, 2012 by using different nets with the help of artisanal fishermen. Fishes were also collected from local fish markets. We have collected 66 fish species belonging to 9 orders, 22 families and 38 genera. Order Cypriniformes was the dominant group with 26 species followed by Siluriformes and Mugiliformes each with 11 species, Perciformes with 7 species, Anguilliformes, Cyprinodontiformes and Mastacembeliformes each with 3 species and Osteoglossiformes and Elopiformes each with 1 species. Out of 66 species, 3 species are near threatened, 3 vulnerable, 4 at lower risk near threatened, 1 at lower risk least concern, 37 least concern, 15 not evaluated and for 3 species data is deficient as per IUCN (2013) Red List category. According to CAMP (1998) conservation status, 4 species are endangered, 13 vulnerable, 24 at lower risk near threatened, 2 at lower risk least concern, 22 not evaluated and for 1 species data is deficient.

### **ECO CLUBS TO BE SET UP IN VIZAG**



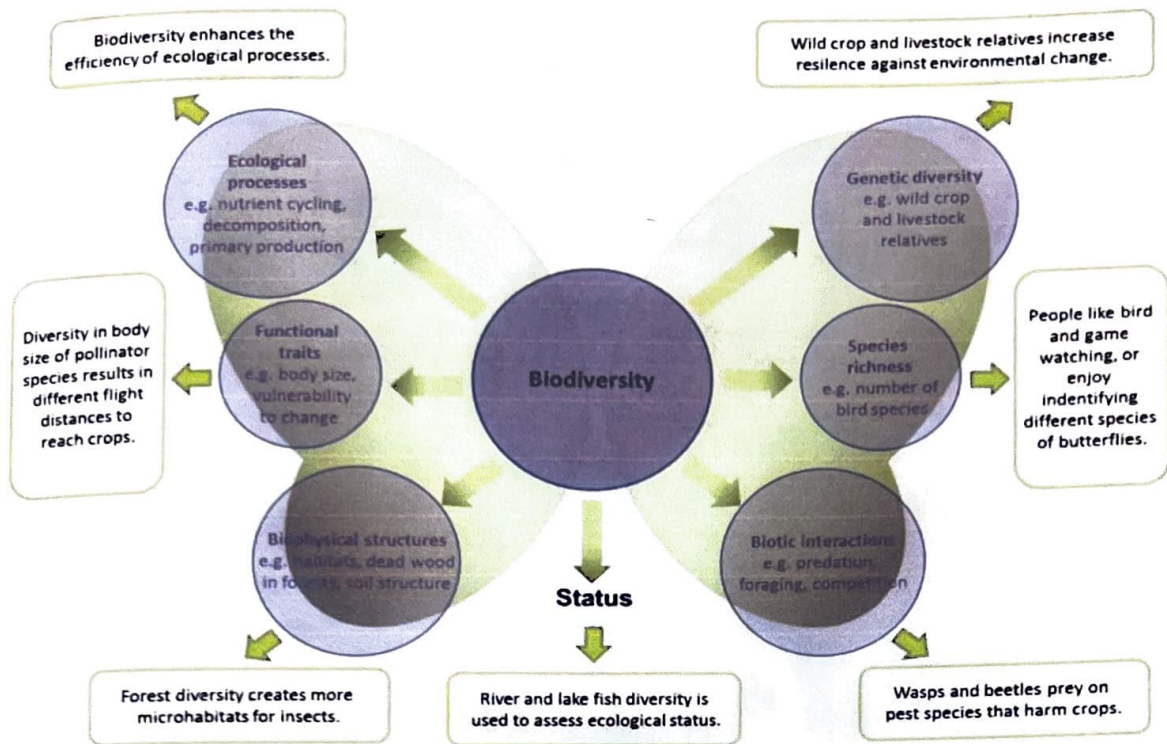


**VISAKHAPATNAM:** With an aim to increase public participation in greening and enhancing biodiversity conservation in the city of Visakhapatnam, the forest department, in association with nature enthusiasts, NGOs, civil society groups and volunteers, is planning to develop a framework for setting up nature and eco clubs. The clubs will be set up across the district with the objectives of documenting and conserving biodiversity with the active involvement of the public, said Anant Shankar, Visakhapatnam District Forest Officer and Curator of Indira Gandhi Zoological Park.

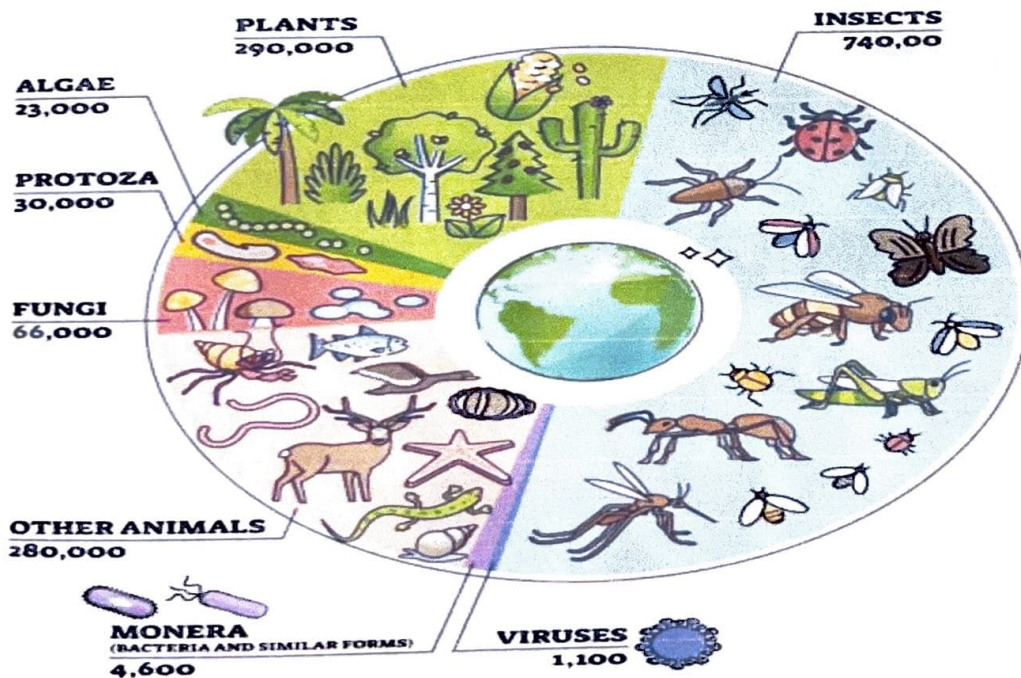
The DFO stated that the forest department will help provide infrastructure facilities across the city for such clubs. The emphasis will be on developing People's Biodiversity Registers (PBRs) with the local urban bodies. Such eco clubs will play a very important role in protecting the environment and biodiversity in urban surroundings.

He further added that people can contribute as per their interests, like photography, conservation of butterflies, the study of different types of birds, conservation of plants and trees, wetlands, etc., through the eco clubs, and every programme organised by eco clubs will be documented.

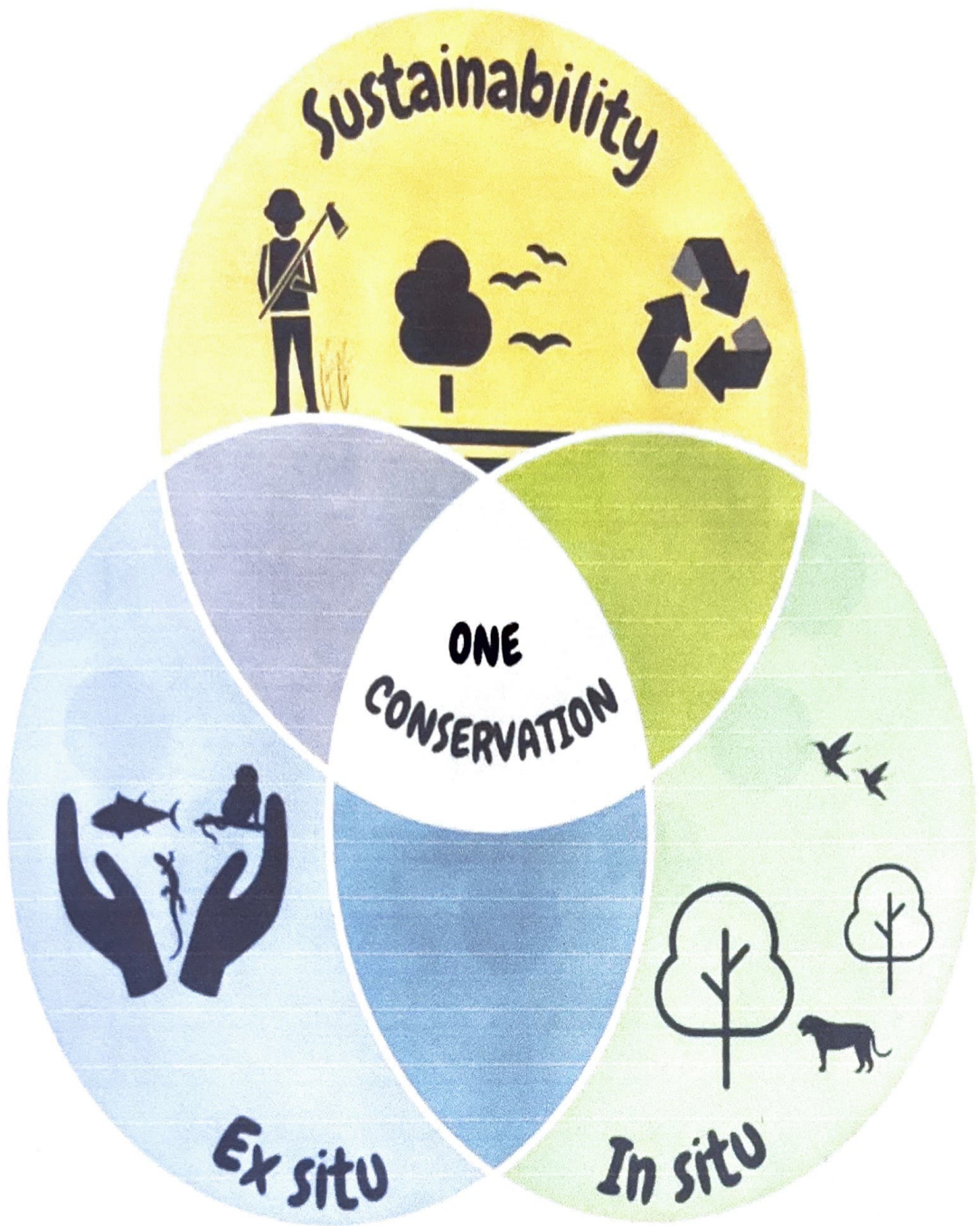




## ESTIMATED NUMBER OF KNOWN LIVING SPECIES











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