



# ex-situ

Updates

**DOUBLE EDITION**

**OCT 2023 TO MARCH 2024**

**VOL 4 ISSUE 4 & VOL 5 ISSUE 1**



Central Zoo Authority  
केन्द्रीय चिड़ियाघर प्राधिकरण



Ministry of Environment Forest  
and Climate Change







Central Zoo Authority  
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FROM THE DESK OF THE

# MEMBER SECRETARY



With the initiative to recognise Indian zoos as one of the centres for Education and Conservation, the Central Zoo Authority under the National Zoo Policy, 1998 and Recognition of Zoo Rules, 2009 has made it mandatory for the zoos to disseminate the knowledge about importance of Wildlife Conservation. The Zoos are regularly aiming to achieve these objectives by carrying out various outreach activities and campaigns to engage the different folks of the society and also by providing naturalistic settings to the captive animals. Few such initiatives have been highlighted in this issue which includes Celebration of Wildlife Week 2023 along with the campaign “Swachhta Hi Seva”.

In order to enhance the skills and knowledge of officers/officials/staff working in the recognised zoos of the country various capacity building programmes, trainings and workshops has been organized by the Central Zoo Authority from time to time. One such workshop organised was the “2nd National Level Stakeholder Workshop on Development of NRC-W (National Referral Centre for Wildlife) and One Health Collaborations wherein the experts from various sectors contributed in the development of NRC-W. An overview of the same are also highlighted in the present issue.

As you all are aware that the efforts are being made for reintroduction of Cheetah into the Indian wilderness. Beyond safeguarding a critically endangered species, initiatives like reintroduction serve as a linchpin for promoting overall biodiversity and ecosystem health. This endeavour not only contributes to the conservation of a critically endangered species but also promotes biodiversity and ecosystem health. The present issue showcases the brief about Cheetah Conservation at Greens Zoological Rescue and Rehabilitation Centre, Jamnagar.

Furthermore, Indian zoos are at the forefront of incorporating innovation in enhancing educational experiences for visitors. The innovative ways of enriching visitor’s experience will embed a fruitful conservation message and inspire visitors to

actively participate in wildlife protection. A short highlight about the Zoo Ambassador Programme of Arignar Anna Zoological Park, Vandalur and Educational activities practiced by Kamla Nehru Prani Sangrahalaya, Indore have been included in the newsletter.

Moreover, the present issue also highlights the Journey of the Central Zoo Authority through the Former Member Secretary, Dr. Brij Raj Sharma (IFS, Retd.) which gave insight into the major challenges he has faced during his tenure and the initiatives taken during that time in the development of guidelines for zoos and planned breeding of endangered species in Indian zoos by the CZA. A brief about Tierpark Berlin, Germany and Rajgir Zoo Safari, Nalanda, Bihar has been showcased in the “**Zoo in Focus section**” of the newsletter. The section “**Zoo in History**” covers the brief history of Gandhi Zoological Park, Gwalior, Madhya Pradesh.

I hope that overall, the collective and integrated efforts of Indian zoos underscore their pivotal role in wildlife conservation, education, and instilling a profound sense of responsibility towards the environment.

With Best Wishes, I present, the issue of the CZA quarterly newsletter **ex-situ updates Double Edition, October, 2023 to March 2024 (Volume 4 Issue 4 & Volume 5 Issue 1)** for disseminating awareness about all the cooperative and virtuous tasks zoos of the country are practicing.

**Dr. Sanjay Kumar Shukla**

Member Secretary,  
Central Zoo Authority

# TRIBUTE CORNER

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## **YASHMIN (SNOW LEOPARD)** AT PADMAJA NAIDU HIMALAYAN ZOOLOGICAL PARK, DARJEELING, WEST BENGAL



Yashmin was born to sire Tyson and dam Rambha on 25th May of 2004 in PNHZ Park. On May 5th, 2022, Yashmin left for her heavenly abode at the age of 17 years 11 months.

Even though Yashmin never gave birth to cubs in her lifetime despite attempts of the Park to successfully breed her, she was a joy to watch and a source of excitement for visitors who were always overjoyed to see the

majestic animal. The park was saddened by her death as she was with us for 18 years. Before death she was one of the longest living snow leopards in the World. She was the progeny of the longest living male snow leopard in the zoo, Tyson, who also survived for 18 years.

# NEWS & EVENTS

- Capacity Building Programmes and Workshops
- 2nd National Level Stakeholder Workshop for the Development of the NRC-W and One Health Collaborations
- Swachhta Hi Seva campaign and Wildlife Week celebration 2023
- Member Secretary, CZA Visits  
CPSG Annual Meeting from 5<sup>th</sup> to 8<sup>th</sup> October, 2023 at San Diego, California  
78<sup>th</sup> WAZA Annual Conference from 8-12 October 2023 at San Diego, California
- 40<sup>th</sup> CZA meeting
- Pledge by CZA officials/staff
- Cleanliness drive by CZA officials/staff
- Zoo News



# CAPACITY BUILDING PROGRAMME & WORKSHOPS

**ORGANIZATION OF THE CAPACITY BUILDING WORKSHOP FOR ZOO VETERINARIANS AT VAN VIHAR NATIONAL PARK ZOO, BHOPAL, MADHYA PRADESH FROM OCTOBER 16<sup>TH</sup> TO 18<sup>TH</sup>, 2023**



**ORGANIZATION OF THE CAPACITY BUILDING WORKSHOP FOR ZOO EDUCATOR AT NAWAB WAZID ALI SHAH ZOOLOGICAL PARK, LUCKNOW, UTTAR PRADESH FROM NOVEMBER 06<sup>TH</sup> TO 08<sup>TH</sup>, 2023**





**ORGANIZATION OF THE CAPACITY BUILDING PROGRAMME FOR ZOO KEEPER OF THE SOUTHERN REGION AT SRI VENKATESWARA ZOOLOGICAL PARK, TIRUPATI, ANDHRA PRADESH FROM DECEMBER 6<sup>TH</sup> TO 8<sup>TH</sup>, 2023**



**ORGANIZATION OF THE CAPACITY BUILDING PROGRAMME FOR ZOO KEEPER OF THE NORTHERN REGION AT M.C. ZOOLOGICAL PARK, CHHATBIR, PUNJAB FROM DECEMBER, 11<sup>TH</sup>- 13<sup>TH</sup>, 2023**



**ORGANIZATION OF THE CAPACITY BUILDING PROGRAMME FOR ZOO KEEPER OF THE NORTH-EAST REGION AT ASSAM STATE ZOO CUM BOTANICAL GARDEN, GUWAHATI, ASSAM FROM DECEMBER 18<sup>TH</sup> TO 20<sup>TH</sup>, 2023**



**CAPACITY BUILDING PROGRAMME FOR ZOO KEEPER OF THE EASTERN REGION AT  
NANDANKANAN ZOOLOGICAL PARK, BHUBANESWAR, ODISHA HELD FROM  
5<sup>TH</sup> TO 7<sup>TH</sup> MARCH, 2024**



# 2<sup>ND</sup> NATIONAL LEVEL STAKEHOLDER WORKSHOP

2<sup>ND</sup> NATIONAL LEVEL STAKEHOLDER WORKSHOP FOR THE DEVELOPMENT OF THE NRC-W AND ONE HEALTH COLLABORATIONS HELD ON DECEMBER 22<sup>ND</sup>, 2023 (FRIDAY) AT GANGA AUDITORIUM, INDIRA PARYAVARAN BHAWAN, MOEF&CC, JOR BAGH, NEW DELHI.



# SWACHHTA HI SEVA CAMPAIGN & WILDLIFE WEEK CELEBRATION

## SWACHHTA ABHIYAN BY BHAGWAN BIRSA BIOLOGICAL PARK, RANCHI, JHARKAHAND



## SWACHHTA ABHIYAN BY ARIGNAR ANNA ZOOLOGICAL PARK



## SWACHHTA ABHIYAN BY NATIONAL ZOOLOGICAL PARK, NEW DELHI



**SWACHHTA ABHIYAN BY MUMBAI ZOO**



**WILDLIFE WEEK CELEBRATION 2023 AT ARIGNAR ANNA ZOOLOGICAL PARK**



**WILDLIFE WEEK CELEBRATION 2023 AT BHAGWAN BIRSA BIOLOGICAL PARK, RANCHI, JHARKHAND**



**WILDLIFE WEEK CELEBRATION 2023 AT GANDHI ZOOLOGICAL PARK, GWALIOR, MADHYA PRADESH**



**WILDLIFE WEEK CELEBRATION 2023 AT INDIRA GANDHI ZOOLOGICAL PARK, VISAKHAPATNAM, ANDHRA PRADESH**



**WILDLIFE WEEK CELEBRATION 2023 AT MUMBAI, MAHARASHTRA**





# MEMBER SECRETARY, CZA VISITS

THE MEMBER SECRETARY, CENTRAL ZOO AUTHORITY HAS ATTENDED CPSG ANNUAL MEETING FROM 5<sup>TH</sup> TO 8<sup>TH</sup> OCTOBER, 2023 AT SAN DIEGO, CALIFORNIA AND 78<sup>TH</sup> WAZA ANNUAL CONFERENCE FROM 8<sup>TH</sup>-12<sup>TH</sup> OCTOBER 2023 AT SAN DIEGO, CALIFORNIA.



# 40<sup>TH</sup> CZA MEETING

**40<sup>TH</sup> MEETING OF THE CENTRAL ZOO AUTHORITY HELD UNDER THE CHAIRPERSONSHIP OF SHRI BHUPENDER YADAV, HON'BLE MINISTER FOR ENVIRONMENT, FOREST AND CLIMATE CHANGE, GOVERNMENT OF INDIA ON NOVEMBER 28, 2023 AT INDIRA PARYAVARAN BHAWAN, JORBAGH ROAD, ALIGANJ, NEW DELHI.**



# PLEDGE BY CZA STAFF

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## RASHTRIYA EKTA DIWAS PLEDGE CZA STAFF



## VIGILANCE PLEDGE CZA STAFF



# CLEANLINESS DRIVE BY CZA STAFF

CLEANLINESS DRIVE CARRIED OUT BY THE OFFICIALS/STAFF OF THE CENTRAL ZOO AUTHORITY ON 20<sup>TH</sup> OCTOBER, 2023 AT NATIONAL ZOOLOGICAL PARK, NEW DELHI



# ZOO NEWS

OCTOBER-DECEMBER 2023

### Lion safari a hit among visitors at Vandavur zoo

17 Oct 2023, 10:55 AM IST



Children love the lion safari, introduced at the tiger zone. The lion safari is a hit among visitors at Vandavur Zoo. The lion safari is a hit among visitors at Vandavur Zoo. The lion safari is a hit among visitors at Vandavur Zoo.

### Schoolchildren celebrate wildlife week at Ludhiana zoo

17 Oct 2023, 10:55 AM IST



Ludhiana Zoo on Tuesday organised a drawing and a quiz competition for school students on the occasion to mark the 100th birthday of the zoo.

### Pune News : Zebras To Be Brought To Katraj Zoo After 8-9 Months

17 Oct 2023, 10:55 AM IST



On the occasion of the 100th anniversary of Pune's national heritage, the Pune Zoo is planning to bring three zebras to the Katraj Zoo.

### Mysuru zoo's Wildlife Week celebrations take off

17 Oct 2023, 10:55 AM IST



Photography and painting competitions 'Under the Big Top' and 'Big Top', 'International Invertebrates Day' and 'Wildlife Week' programmes are being organised at Mysuru Zoo.

### Capuchin monkeys back in Hyderabad zoo to mark diamond jubilee

17 Oct 2023, 10:55 AM IST



Two members of the species, males in total and both females, have been introduced to the zoo to mark the diamond jubilee.

### Mumbai's Byculla zoo welcomes three more penguins

17 Oct 2023, 10:55 AM IST



On the occasion of the 100th anniversary of Mumbai's national heritage, the Byculla Zoo has welcomed three more penguins.

JANUARY-MARCH 2024

### With world's largest number of Snow Leopards in captivity, how Darjeeling zoo India's lone Conservation Breeding Programme, scripted a success story

17 Oct 2023, 10:55 AM IST



Using their expertise in keeping snow leopards in a conservation breeding programme, the zoo has managed to produce 100 cubs in captivity.

### White tigress gives birth to two cubs at zoo in Chhattisgarh's Durg district

17 Oct 2023, 10:55 AM IST



With the birth of these cubs, the number of white tigers in the zoo located in Durg city, about 200 km away from state capital Bhopal, has gone up to 12.

### Darjeeling zoo's success with snow leopards: Why wild cats are fussy breeders

17 Oct 2023, 10:55 AM IST



The Darjeeling zoo has achieved a remarkable feat by breeding wild cats in captivity. The zoo has managed to produce 100 cubs in captivity.

### Hyderabad Zoo's Star Tortoise Chanakya Dies At the Age of 125

17 Oct 2023, 10:55 AM IST



Chanakya, the most popular-looking Galapagos giant tortoise, died at the Telangana Zoological Garden in Hyderabad at the age of 125.

### New tiger on the block: 'Aman' to meet residents at Ludhiana zoo today

17 Oct 2023, 10:55 AM IST



The new tiger at Ludhiana Zoo, 12-year-old Aman is all set to meet city residents for the first time on Tuesday.

### Ranibaug zoo organises exclusive tour for differently-abled

17 Oct 2023, 10:55 AM IST



The Ranibaug Zoo, Ranibaug, Shivajinagar, has organised an exclusive tour for differently-abled people.

# SPECIES IN FOCUS

## CHEETAH

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### CHEETAH CONSERVATION AT GREENS ZOOLOGICAL RESCUE AND REHABILITATION CENTRE, JAMNAGAR

Text & Photos: **DR. BRIJ KISHOR GUPTA**

Director, Greens Zoological, Rescue and Rehabilitation Centre, Jamnagar, Gujarat



**The Cheetah** (*Acinonyx jubatus*) is a large cat, characterized by a lightly built body stature with tawny to creamy white or pale buff fur marked with evenly spaced, solid black spots. Its slender body, with small rounded head, short snout, black tear like facial streaks, a deep chest, long thin legs and a long tail is highly adapted for speed. Cheetahs typically reach 67-94 cm at the shoulder and the head and body length is between 1.1 to 1.5 m. It is the fastest land animal, capable of running at 80 to 90 km/h, and has evolved specialized adaptations for speed.

Cheetah was first described in the 18th century and at present four subspecies are recognised, native to Africa and Iran, as per the Cat classification Task Force of the IUCN Cat Species Group. The present distribution of the Cheetah is restricted to north-western, eastern and southern Africa and central Iran. The species can survive in a variety of habitats such as Savannas in the Serengeti, arid mountain ranges in the Sahara and hilly desert terrain.

The Cheetah, once abundant throughout its distribution

range, is now threatened by habitat loss, conflict with humans, poaching and high susceptibility to diseases. In 2016, the global Cheetah population was estimated to be 7100, individuals in the wild. The species is listed as vulnerable as per the IUCN red list of threatened species. The species is also listed in Appendix I of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) and Convention on the Conservation of Migratory Species of Wild Animals (CMS). The species was also depicted in art, and literature and was tamed and trained for hunting in ancient Egypt, in the Arabian Peninsula and India. The species was kept in Zoo since the early 19th century.

In Asia, Cheetahs are now confined to Iran, where the subspecies *Acinonyx jubatus venaticus* is estimated about 60-100 and listed as Critically Endangered. The low density of the Cheetah across their range is well evidenced and the population was fragmented also that causes the concern regarding the long term survival of the population in future.

## EX-SITU POPULATION OF CHEETAHS IN INDIAN ZOOS:

There are two zoos in India that are housing Cheetah. South African Cheetah (*Acinonyx jubatus jubatus*) was housed at Sri Chamarajendra Zoological Gardens, Mysuru, Karnataka and Somalian Cheetah (*Acinonyx jubatus soemmeringii*) was housed at the Greens Zoological Rescue and Rehabilitation Centre (GZRRC), Jamnagar, Gujarat.

Sl No	Name of the Zoos	Male	Female	Unsexed	Total
1.	Sri Chamarajendra Zoological Gardens, Mysuru, Karnataka (source: cza animal inventory 2022-2023)	1	2	0	3
2.	Greens Zoological, Rescue and Rehabilitation Centre, Jamnagar, Gujarat	24	22	36	82

### GZRRC FACILITIES FOR THE PLANNED CONSERVATION BREEDING OF CHEETAH

The GZRRC has a long term goal for the conservation of Cheetah and had created the species specific facilities for its conservation breeding in consultation with international consultants.

#### ABIOTIC ENVIRONMENTAL VARIABLES

The species usually thrive in dry grassland habitat and mostly in arid and semi condition. Although within captivity the species need protection from the inclement weather condition. Thus adequate ventilation within the indoor enclosure has been provided for the species for improving the air quality and the moisture condition. Sufficient natural lighting has been ensured within the indoor enclosure for routine cleaning although subdued light levels are recommended.

#### ENCLOSURE SPECIFICATIONS

A major component of the management of Cheetah within captivity and the health care program is the facility design. Important aspects to be considered includes the size of the enclosure, the substrate, and shelter areas. Enclosure should be of adequate size to allow the animals with a variety of sites to stimulate activity. The facility within GZRRC having a total of 19 acre area devoted to keep the species. The 10 specially designed enclosures to keep breeding individuals having a total of 19000 square meter of area having open enclosure and paddock area. There are ten separate enclosure each for keeping male females and six enclosures for keeping juvenile animals. Each enclosure having an indoor enclosure as per the need of the animal. Each enclosure for male having the area of 40000 square feet, whereas each of the enclosures for the female having 16000 square feet.

#### BEHAVIOURAL ENRICHMENT & HUSBANDRY PRACTICES

Behavioural enrichment of the animal kept in captivity is an important aspect to allow the animal to show species typical behaviour. Wooden Logs have been provided within the enclosure to allow the animals to scratch for claw wear and maintenance. The animals have adequate hiding areas within the enclosure for limited seclusion. Each enclosure is provided with visual barrier for the species to completely hide behind and a den that can be defended against a cage mate. A separate holding area has been provided in order to safely move animals from their primary enclosure for cleaning, feeding and medical procedures.

Protection from temperature extremes, wind and rains has provided to each individuals in captivity and each individuals have access to both outdoor and indoor enclosures. Indoor enclosure are well ventilated to minimize odour, dust and moisture condensation. Fresh clean water is made available at all times and water bowls are cleaned and disinfected daily. Automatic watering devices are used for the species.

Perches and shelves where the animal climb, sit and rest have been provided free of faeces and urine and they are cleaned at regular interval.

Natural settings with vegetation and soil provide good enclosures for cheetah. The dirt substrate may become contaminated over time with micro organisms and parasites thereby exposing the cats to potential concentrations of pathogens. Contaminated substrates is removed periodically and replaced with clean materials. Further, a cleansing regime is followed to disinfect the substrate.

Each enclosure has provision for clean water accessible to both the animals and the animal keepers.



## NUTRITION

Free roaming Cheetahs consume a variety of whole vertebrate prey, while eating muscle, skin, fur/feathers, as well as viscera and bones. They get a balanced diet in the wild that is difficult to replicate in a captive environment as the prey animals fed to them in captivity have had different species. In an captive setting, the husbandry and nutrition administered to cheetahs needs to be optimized, in order to maintain the welfare of the animal and increase the success of the captive breeding program. While designing the nutritional requirement of the species at GZRRC, the care is being taken that all animals diet get the adequate calcium phosphorus balance, thus inclusion of bone for chewing, a varied diet including occasional whole body carcass. Other than that unique nutritional requirements like dietary vitamins (Vitamin A), arachidonic acid, taurine, and niacin are being added within the diet as per the requirement of the animals and as prescribed by the Nutritionist and Veterinary Officer of the GZRRC.

## REPRODUCTION

Reproductive efficiency in captive cheetahs is reported to be a relatively poor. The problems associated with breeding, including infertility and high infant mortality, have been related to management techniques. The major concerns are related to the nutrition, enclosure size and design, human contact, segregation and re-introduction, as well as sex ratio also. At the GZRRC, it has been envisioned that the optimal condition for the captive breeding will be explored with the help of national and international experts from the field.

Breeding cheetahs in captivity requires careful attention

to several technical aspects to ensure their health, well-being, and successful reproduction.





**CHEETAH  
CONSERVATION  
BREEDING**

The infographic features a central white circle with a green border containing the text 'CHEETAH CONSERVATION BREEDING'. Surrounding this circle are 11 white, arrow-shaped callouts pointing towards the center, each containing a specific area of focus in a different color. The background is a dark green with a subtle pattern of cheetah spots and a silhouette of a cheetah in a savanna landscape at the bottom.

**DIET &  
NUTRITION**

**ENCLOSURE  
DESIGN**

**HEALTHCARE**

**BEHAVIORAL  
ENRICHMENT**

**BREEDING  
MANAGEMENT**

**GENETIC  
DIVERSITY**

**ENVIRONMENTAL  
CONDITIONS**

**TRAINING &  
SOCIALIZATION**

**RESEARCH &  
COLLABORATION**

**CONSERVATION  
EDUCATION**

## RECOMMENDATIONS:

- i. Enclosure Design: Create spacious and naturalistic habitats that mimic their wild environment. Include areas for exercise, shelter, privacy, and enrichment.
- ii. Diet and Nutrition: Provide a balanced and species-appropriate diet rich in lean meat, vitamins, and minerals. Consult with veterinarians and nutritionists for tailored feeding plans.
- iii. Healthcare: Regular health checks, vaccinations, and preventive care are crucial. Develop a comprehensive healthcare program in collaboration with experienced veterinarians.
- iv. Behavioral Enrichment: Stimulate natural behaviors like hunting, climbing, and social interaction through enrichment activities such as toys, puzzles, and simulated hunting exercises.
- v. Breeding Management: Understand the reproductive biology of cheetahs, including estrus cycles and breeding behaviors. Maintain records and pedigrees for genetic diversity and conservation purposes.
- vi. Genetic Diversity: Cooperate with accredited breeding programs to avoid inbreeding and maintain a healthy genetic pool. Exchange animals with other institutions to introduce new genetic lines.
- vii. Environmental Conditions: Monitor and control environmental factors such as temperature, humidity, and lighting to create optimal conditions for breeding and rearing offspring.
- viii. Training and Socialization: Train cheetahs for cooperative behaviors like voluntary medical procedures, crate training, and positive human interactions. Promote socialization with conspecifics to support natural social structures.
- ix. Research and Collaboration: Stay updated on scientific research and collaborate with experts in cheetah conservation, reproduction, and management to implement best practices and address challenges effectively.
- x. Conservation Education: Use captive breeding programs as opportunities for public education and awareness about cheetah conservation issues, habitat preservation, and wildlife protection efforts.

By addressing these technical requirements comprehensively, captive breeding programs can contribute significantly to the conservation of cheetahs and their genetic diversity.

## CONCLUSION:

The World's conservation Union's development of a global network for species survival (IUCN, 1991) identifies the threats that endangered species face from the growing human population and its increasing consumption of natural resources. The species survival commission also recognizes the full significance of captive breeding programs to reinforce conservation efforts in the world.

The in-situ population of Cheetah is decreasing world-wide and in India it is extinct from its geographical distribution range. There is immediate need to rejuvenate the existing population of the species in its distribution range. The species is an ideal candidate for future re-introduction projects also. The Govt. of India have taken the initiative for the re-introduction program from 1970s onwards. The Supreme court of India allowed the import of African Cheetahs in year 2020 and the reintroduction program for Cheetah in India Initiated thereof. In year 2022 the reintroduction program initiated in Kuno National Park in the state of Madhya Pradesh.

The conservation breeding of endangered species is one of the important initiative to conserve threatened species of the Central Zoo Authority. Cheetah being extinct in the wild in India and having threatened population in other range countries is one of the ideal candidate for conservation breeding.

The Greens Zoological Rescue and Rehabilitation Centre is having the commitment to saving species by uniting the expertise in animal care and conservation science with the dedication and passion for nature through best practice and management and bringing education and awareness among the people. GZRRC with its state of the art facility for animal welfare is willing to participate in the conservation breeding of certain endangered species. The initiative of Conservation breeding of Cheetah will be in line with the long term conservation goal of the species globally. The infrastructural facility and the trained and dedicated manpower of GZRRC is well equipped for taking up the planned conservation breeding program of the species.

# BEST PRACTICE

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## ENHANCING CONSERVATION EDUCATION THROUGH THE ZOO AMBASSADOR PROGRAMME: A CASE STUDY OF ARIGNAR ANNA ZOOLOGICAL PARK

Text & Photos: **P. SHANKARI , G.KAMARAJ, M.SEKAR, S.R.CHANDRAMOULI**

### ABSTRACT

Conservation education plays a pivotal role in fostering an understanding of wildlife and the importance of biodiversity conservation among the younger generation. The Zoo Ambassador Programme initiated at Arignar Anna Zoological Park (AAZP) in 2018 serves as an exemplary model for engaging students in immersive, field-based learning experiences. This paper presents a study conducted to assess the effectiveness and reception of the Zoo Ambassador Programme among participants. The comprehensive review of, focusing on their objectives, design, outcomes, and upgradation. By synthesizing empirical studies, theoretical frameworks, and practical insights, this review aims to provide a holistic understanding of the role of zoo ambassador in joint effort of creating wildlife conservation awareness messenger through zoo education programme. The findings underscore the importance of such programs in promoting environmental stewardship, facilitating visitor learning, and advancing wildlife conservation efforts.

### KEYWORDS

Conservation education, Zoo Ambassador Programme, Arignar Anna Zoological Park, Field-based learning, Wildlife conservation.

### INTRODUCTION

Conservation education programmes implemented in zoological parks play a crucial role in raising awareness about wildlife conservation and biodiversity among the public, particularly the younger generation. Recognizing the importance of educating youth about wildlife conservation, Arignar Anna Zoological Park (AAZP) introduced the Zoo Ambassador Programme in 2018. Earlier the term " Zoo Ambassador" is referred to zoo animals. Sarah L. Spooner (1) who support for their counterpart conservation in the wild. The zoo programme in AAZP impart the young minds to be conservation messenger for zoo animals. By aiming to provide students with immersive learning experiences, fostering a deeper understanding of wildlife and conservation principles. Through interactive sessions, field trips, and mentorship from wildlife experts,

participants are equipped with the knowledge and skills to become advocates for conservation. Student visitors make up more than one third of the total visitation in AAZP Zoo print 1999 (2) by providing effective high-level of innovative conservation education and awareness programmes. AAZP Master plan 2013-2023 (3) is prime motto of zoo education plan.

### PROGRAMME STRUCTURE & CURRICULUM

The Zoo Ambassador Programme at AAZP is structured to offer comprehensive insights into various aspects of wildlife, including mammals, birds, reptiles, butterflies, and fishes. Each session covers topics such as animal classification, habitat, behavior, adaptations, and the significance of different species in ecosystems. The programme incorporates interactive sessions with veterinarians, biologists, zoo educators, foresters, and animal keepers to provide diverse perspectives on wildlife conservation. Students in the 5th grade and above are eligible to participate in this program, which emphasizes mixed-age group learning among participants. To engage the current generation, the program employs digital teaching methods such as presentations, documentary screenings of zoos functions and activities, with immersive field-based learning on zoo animals. Each participant receives a program kit containing a bag, notepad, pen, cap, assignment worksheets for each class of the animal kingdom and a book on the animals of Vandalur Zoo on the first day of the camp. The Zoo Ambassador Program spans three days during summer holidays and two days during winter holidays. During the COVID-19 pandemic, it was extended to 10 days & a week-long programs through online mode, attracting students from various states across India who demonstrated keen interest in participation. Additionally, a one-day Zoo Ambassador Program is organized specifically for government & private schools on request basis. The curriculum of this program is thoughtfully designed to offer an attractive package that covers a diverse range of topics separately focusing on mammals, birds, reptiles and butterflies.

### PARTICIPANT FEEDBACK AND PROGRAMME EVALUATION

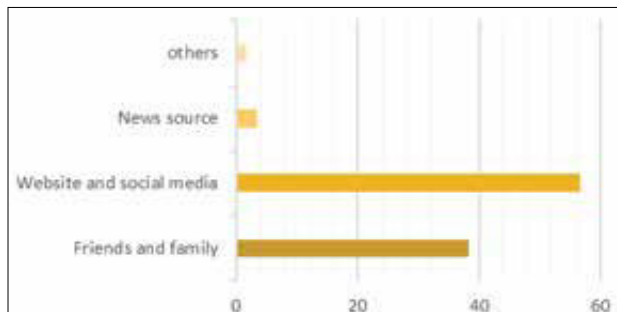
A questionnaire survey study was conducted to assess

the effectiveness of the Zoo Ambassador Programme, focusing on the audience's mindset, participation rates, learning desires, key takeaways, and feedback on the last day of the programme. The findings reveal a high level of satisfaction among participants, with the majority expressing enthusiasm and a desire to learn about wildlife conservation. Feedback from participants indicates that the programme successfully achieves its objectives of providing valuable education beyond the school curriculum and fostering a connection with nature.

## RESULTS & FINDINGS

From 2018 to 2023, a total of 3788 students have actively participated in the sessions and were honored with the title "Zoo Ambassador of Vandalur Zoo," receiving a certificate, badge, and a passport entitling them to 10 complimentary visits. Over this period, 55 batches of the zoo ambassador program were conducted, marking it as one of the most popular wildlife conservation zoo education initiatives.

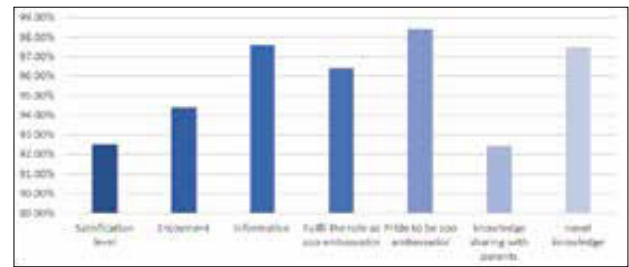
On evaluating the Questionnaire survey received from the participants the following findings were revealed. An analysis of participation sources to join the programme reveals that 38.35% of students were referred by friends and family, 56.64% joined through the website and social media posts, 3.4% through news source and 1.61% through other channels.



► Source : Primary Data

The zoo education program at AAZP is designed with outcome-based planning Master plan 2023-2042 (4), according to the data received through the feedback forms of 3788 no of participants. In the rank out of 10, 8-10 (Commendable), 5-7 (Average) below 5 need improvement. Results indicate high satisfaction levels among participants 92.50%, 94.40 % rated the Zoo Ambassador program as highly enjoyable, 97.6% found it informative, and 96.4% felt adequately trained to fulfill the role of a Zoo Ambassador. Moreover, 96.4% expressed a strong sense of pride in being part of the Zoo Ambassador program and 98.42% would recommend it to others. Additionally, 92.45% of participating students discussed the program with their parents after the session, and 95.26% agreed to share their learning with family and friends. 97.48% of

participants reported acquiring novel knowledge or skills that were previously unfamiliar to them.



► Source : Primary Data

Encouraged by its overwhelming response of the participants the Central Zoo Authority (CZA) support this initiative by recommending it in CZA - Zoo vision plan (5) 2021-2031 as 'leading practices' and as best innovative practice in CZA Zoo MEE report 2022(6). Going forward other Indian zoos have also incorporated Zoo Ambassador programme in their conservation education programme. Recently Nandankanan Zoological Park in Bhubaneswar, Orissa Indira Gandhi Zoological Park in Visakhapatnam, AP and the Parassinikadavu Snake Park - Kannur Kerala, has introduced this program, while some Indian zoos are in the preparatory stages of implementing Zoo Ambassador programs in their respective zoos. Indian zoos focus to engage celebrities /wildlife enthusiasts as zoo ambassador.

## IMPACT AND RECOMMENDATIONS

Since its inception, the Zoo Ambassador Programme has witnessed significant success, with thousands of students actively participating and becoming advocates for wildlife conservation. The overwhelmingly positive feedback from participants underscores the programme's effectiveness in inspiring and educating the younger generation. Zoo Ambassador are the formal representative of India zoos who serve as advocates for the zoo mission and initiatives and play a crucial role in promotion of zoo and raise awareness It is to be noted that importance , significance and interesting facts about wild flora and fauna remain inadequately emphasized in current school curriculum . Moreover, in today's digital age, the younger generation often lacks a meaningful connection with nature. The programme provided by the Zoo serves to bridge this gap by offering exceptional educational opportunities..

## CONCLUSION

The Zoo Ambassador Programme at Arignar Anna Zoological Park exemplifies a successful initiative in conservation education, engaging students in immersive learning experiences and fostering a deeper appreciation for wildlife and biodiversity. Through its structured curriculum, interactive sessions, and

mentorship opportunities. As an enhancement to this module, the Species Ambassador Programme was launched in 2021 with a specific focus on raising awareness about lesser-known species that are vulnerable or endangered. The programme equips participants with the knowledge and skills to become ambassadors for wildlife conservation and promotion of zoos among the public. The collective effort towards conservation education is strengthening, to ensure a brighter future for wildlife and ecosystems.

### ACKNOWLEDGMENTS

We would like to express our gratitude to APCCF & Director, Deputy Director, Assistant Director, Veterinarians, Forest Range Officer, Foresters, Forest Guards, Animal keepers and all staff of AAZP. We also extend our thanks to the participants of the Zoo Ambassador Programme for their enthusiasm and valuable feedback.

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# TALKING HEADS

## JOURNEY OF CENTRAL ZOO AUTHORITY

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### **DR. BRIJ RAJ SHARMA, IFS (RTD)**

Former Member Secretary, Central Zoo Authority

#### **How were your days as Member Secretary of the Central Zoo Authority?**

I am a forester and a trained wildlifer, who's main academic interest is ex-situ wildlife conservation. My association with zoos began in October 1997, when I was virtually airlifted from Darjeeling (was working as Divisional Forest Officer, Darjeeling Forest Division) to take charge of the National Zoological Park, New Delhi, because of some cropped up issues in the Zoo. Since then, have got stuck in captivity in zoos. Having hard time believing, it is more than a quarter century and am still working in or for zoos.

Joined as Member Secretary, Central Zoo Authority on 1st September (happens to be my birthday) in 2004. This came after my days with Delhi Zoo (1997 to 2000) and Darjeeling Zoo (2000 to 2004). Thoroughly enjoyed working on stable platform created by my illustrious predecessors (Shri S C Sharma and Mr. P R Sinha). Both were still active and around to guide in initial days before started taking my own. Enjoyed to the hilt. Really worked hard to the level of obsession.

#### **In your opinion what are the major challenges met by you during your tenure as a Member Secretary, CZA?**

At the time of my taking over as Member Secretary, Central Zoo Authority directors of most of the major Indian zoos were my service seniors (Indian Forest Service). It was tricky at times to ask them to follow (It is an order, Sir).

We had more than 400 lions, tigers, leopards and bears to be rescued from different circuses and rehabilitate them in specially created Rescue Centers all over India. Watchful eyes of media and some fierce animal welfare activists made the operation more challenging.

We had more than 500 zoos (503 to be exact) including mobile zoos (around 100) and circuses (as zoos only) with thousands of animals at the time of coming up of the Central Zoo Authority. Most in bad shape and directionless. Process of closing (even physical closing with shifting to animals) of bad zoos started under watchful eyes of my predecessors. Have dubious distinction of having issued final marching order for 313 to these slums.

## What are the main initiatives undertaken for Zoos of the country during your tenure?

Must say initiation of having a well thought Master Plan for each and every Indian zoo. Drafted guidelines for preparation of Master Plans for Indian zoos. Visited almost all states and most of the zoos to discuss and finalise concept plans for preparation of Master Plans (164 zoos and circuses) with the Chief Wildlife Wardens and zoo directors/in-charges.

Revisiting 'the Recognition of Zoo Rules, 1992', discussing and finalization of 'the Recognition of Zoo Rules, 2009' along with guidelines for development and scientific management of zoos in India (thanking Mr S C Sharma and Mr S K Patnaik for guidance and help) was the work still feel proud of.

## What initiatives has been undertaken regarding planned breeding of endangered species in Indian zoos during your days in CZA?

Came to the Central Zoo Authority after very successful planned release of zoo bred Red Panda(s) from Darjeeling Zoo to the Singalila National Park in Darjeeling hills (released female recorded mating with wild male and giving birth to three babies – green Oscar winning film 'Cherub of the Mist').

Revived the ongoing conservation breeding programme with identifying the species, fixing responsibilities (as coordinating zoos and participating zoos) for different species. Creation of off display conservation breeding centers for identified species in coordinating zoos was a big challenge.

Organized studies with signing of MOUs with School of Planning and Architecture (SPA), New Delhi (to work on Zoo Architecture and Designing); Center for Conservation Education (CEE), Ahmedabad (for Zoo Education Planning); Wildlife Institute of India (WII), Dehradun (National Studbooks Keeping); Indian Veterinary Research Institute (IVRI), Bareilly (preparation of veterinary healthcare protocol for zoo animals and also on nutrition and diet for zoo animals) and Laboratory for Conservation of Endangered Species (LaCONES), Hyderabad (assisted reproduction, DNA fingerprinting and cloning). Establishment of Regional (at states level) and National (in IVRI, Bareilly) Referral Centers for Wildlife Healthcare was another initiative to make zoos operations more purposeful. Happy to share all these studies and collaborations have really helped in shaping the zoo management in future years.

Three objectives i.e. having proper captive stock for continuous display in Indian zoos, to have properly bred animals to act as insurance in the case of collapse of their wild populations and for reintroduction or release in the wild in case needed, formed base of Conservation Breeding and Recovery Programme for Endangered Species in India.

Organizing international workshop on 'India's conservation Breeding Initiative' in 2008 with participation from WAZA, CPSG (than CBSG) and major world zoos really helped us in convincing WAZA, CPSG and world zoo community about our serious zoo endeavors and agreeing to have their annual meets in India in the year 2014.



### **In your opinion how successful the CZA has been in furthering the cause of the Conservation of wildlife and its Education through zoos?**

Still working on this. The Central Zoo Authority has really succeeded in giving direction to Indian zoos. Most of the zoos have well defined Master Plans as road maps to tread on. Physical closing of such a large number of bad zoos is perhaps only example of this kind in the world.

### **What made you remain associated with Central Zoo Authority and zoos for such a long time?**

The best strategy for the long-term protection of wildlife is its conservation in its natural community in the wild. Only in natural communities are species able to continue their process of evolutionary adaptation to a changing environment. However, in the face of increasing human activities, in situ conservation is not currently a viable option for many rare species and species may decline or go extinct in the wild. It is likely that the only way species in such circumstances can be prevented from going extinct is to maintain individuals in artificial conditions under human supervision. The expertise, infrastructure, and stock of wild animals in various captive breeding facilities including zoos can play a pivotal role in saving many species from extinction. Ex-situ wildlife conservation is a young and controversial discipline, seen by some as inspiring and important, while others view these efforts as overreaching, expansive and inefficient use of resources. Despite the controversy, ex-situ wildlife conservation is evolving into a key discipline for conservation of critically endangered wild animal species. The history of re-introduction from captive propagation is discouraging, but hardly more so than preservation in nature. Each approach has something to offer, but each alone is too specialized for the complexity of modern conservation and multiplicity of responses it depends upon.

Extinction crises continue apace worldwide. Captive wild animal facilities should also position themselves, to make a useful and meaningful contribution to the conservation of wildlife. What matters most is, animals should survive in sufficient variety and numbers, and with enough of their behaviour intact, to take them back to the wild in future, more relaxed and at a more enlightened time. Conservation breeding can help that to happen. If an animal lives as a member of a social group that is proper for its species, feeds upon its near natural feed, find its own mate and rear its own offspring, it does not seem to matter over much, if it is also protected from predators, or its area has limitations. Conservation breeding should be seen to be only a part of the spectrum that extends from the intensive care to the wilderness, of the conservation endeavour.

Firm believe in this all.

## Your suggestions/vision for Central Zoo Authority and Indian zoos?

In 1986 in a landmark paper, 'the millennium ark: how long a voyage, how many state-rooms, how many passengers?' M. Soule and others carved out a scheme for optimal allocation of global zoo space coupled to the application of emerging ex-situ wildlife conservation science. Their proposal is perhaps the most elegant presented to date in terms of making efficient, sustainable, and conservation-relevant use of zoo space. In short, the authors were proposing that ex-situ facilities around the world collaborate to establish a modern-day Noah's Ark.

The task is defined: to keep as many endangered species as possible alive in captivity for as long as is necessary (which could be even centuries) in a state in which they are capable of returning to the wild. Most animals can be kept alive. Most can be induced to breed, at least from time to time. Noah, according to Genesis, saved all the creatures that were then alive simply by taking a pair of each kind into the Ark. At first sight, this seems a reasonable strategy. A healthy young male and a healthy young female are enough to start a family, and then a lineage. Noah was blessed with divine intervention. In practice, there are many issues which need consideration. The problems that remain are of biology, in particular of genetics, and of logistics. It is a tall order, for beyond the existing capabilities. But now is the time to look ahead, co-operate and plan, before options are further narrowed.

In a few centuries time, if all goes well, the importance of zoos as conservation breeding units will diminish. For the present, its significance must grow. For the next few centuries, it must be perceived as a necessary part of civilisation.

Keep going. Best wishes.



# ZOO IN FOCUS- INDIAN RAJGIR ZOO SAFARI, NALANDA, BIHAR

Text & Photos: **DR. GOPAL SINGH, IFS**

Regional Chief Conservator of Forest, Patna-cum- Chairman, Project Monitoring Committee, Rajgir Zoo Safari.

It is a matter of great pleasure that Rajgir Zoo Safari, Bihar's first and only Zoo Safari, has been receiving an enormous response from visitors. Since its inauguration in February 2022, more than 8 Lakh visitors have visited this zoo safari, making it the main place of attraction for visitors across Pan India. The continued high visitor flow attests to the ongoing success of Rajgir Zoo Safari even after two years of operation. Additionally, this eco-tourism facility is running in revenue surplus mode wherein the annual revenue collected is much more than the annual maintenance and operational costs. The animals are healthy and in good vigor due to the facilities developed for them in natural habitat. We are able to provide livelihood to more than 500 families directly and many more indirectly. The quality of the forest has also improved in recent years. All these signify that the design strategy with which Rajgir Zoo Safari has been developed has been successful in letter and spirit.

It gives great satisfaction to see that the project has come up very nicely as per the vision and design strategy against all odds and difficulties. Obviously, the execution of such a big project was the first of its kind and a new experience for the department. The primary vision behind the project was to create an internationally recognized wildlife ex-situ conservation facility. The beauty of this project is its location which is a near-natural habitat of native wild animals. The main design strategy which we adopted is to use the best quality material which will make it a maintenance-free facility.



► Approved Master Layout Plan of Rajgir Zoo Safari

Rajgir Zoo Safari, which spreads over 191.12 hectares of scenic natural forest, surrounded by picturesque hills from two sides, is located near the historically and religiously important city of Rajgir in Bihar's Nalanda district. It is based on a unique idea where wild animals roam freely in a restricted forest area, and visitors can see them from a closed, secure vehicle.

The idea of developing a world-class eco-tourism facility in Rajgir started in 2008 when Shri Nitish Kumar, Hon'ble Chief Minister of Bihar, visited the erstwhile Mrig Vihar located in Rajgir during one of his frequent visits to Rajgir. Being an ardent supporter of the concept of forest and wildlife conservation, the Hon'ble Chief Minister had a vision of developing a state-of-the-art wildlife-based eco-tourism facility to spread awareness among the people of Bihar about nature and wildlife conservation. Being posted in the Chief Minister office for considerably long time and also being in State Forest Department at different positions, as Conservator and Regional Chief Conservator of Forest, Patna, I could connect with the vision that Hon'ble Chief Minister was having for this safari. Thus, I fortunate to be involved in all stages of the development of Rajgir Zoo Safari, starting from its concept to its reality and currently in its successful operation.



► Selfie point, which is very famous among tourists

Initially, it was planned to develop a zoo in Rajgir which would supplement Sanjay Gandhi Biological Park, Patna, in Southern Bihar and would also work as a rescue center for rescued wild animals, especially Sloth Bear and Leopard, etc. But, since a new concept of Safari was emerging at that time, it was decided to develop Bihar's first Wildlife Safari with international level facilities for wildlife and visitors.

The initial designs provided by the consultant were very ordinary and were not tourist and management-friendly. Nor were the designs as per the expectations of the state Govt, which desired a safari of international standards. During my first field visit as in-charge, after the responsibility of project execution was given to Patna region, it was noted that the area provided was not sufficient to cater number of tourists visiting Rajgir. The visitor zone was proposed to be constructed in low-lying water inundated area. There was no separate visitor reception area. Crowd management and tourist circulation was not considered thoroughly. Counters were not considered while preparation of designs. Proposed area for parking facilities was not sufficient. Even for animal enclosures, the concept was given by the consultant was to build this zoo safari in a rudimentary normal way, by constructing enclosures using normal MS chain link. There were practical issues related to the implementation of some of the ideas suggested by the consultant.

Thus, it was decided that since this is a prestigious and dream project of the Bihar Government, the best resources need to be utilized in this project. We took a number of policy decisions at this point like,

- The location and complete design of visitor zone was changed and it was decided to shift the visitor zone to area near main road. Now, the new design was prepared to cater to a minimum of 5,000 visitors a day and 1,000 tourists at a time by giving sufficient space at the entrance and by spreading the facilities at a sufficient distance, for effective crowd management. The design and facilities provided in the visitor zone were finalized to give the best visitor experience with modern facilities. The infrastructures at the reception zone were designed in an oval shape so that it will use a minimum space to fit in maximum facilities. This will also ensure hassle-free movement of visitors, which visitors expect during such visits. It was decided to develop a stone wall with the use of local stones to give the entrance a historical look of Rajgir's Cyclopean Wall. Also, around 2 hectares of the area is provided for the parking of visitor's vehicles and local transportation vehicles.
- It was decided to use the best quality material to make this facility maintenance-free. Hence, use of Stainless Steel solid bars for animal cells and GI chain

link and poles for the enclosure boundary instead of rudimentary use of MS was proposed. This guaranteed a minimum of 20 years of maintenance-free enclosures.

- A comprehensive project plan was prepared including all components of zoo management and got fresh approval for the project from competent authority. Thus, now the project budget was increased to around 176 Cr. instead of earlier approved 59.64 Cr.
- Citing visitor safety, it was decided to develop all-weather roads instead of the impractical solution given by the consultant to make roads with lime stabilization technique.
- It was decided to use specially modified safari vehicles with enhanced window space to give maximum possible visibility to tourists.
- During this period, some decisions were taken like the posting of the best human resource of State Forest department for implementation of the project on-site. Thus, an energetic officer like Dr. K Nesamani, IFS was appointed as Divisional Forest Officer, Nalanda Forest Division. Dr. D. N. Singh, Retd IFS, and former Member Secretary, CZA were appointed as a wildlife expert for the project for necessary expert guidance in zoo designing. Later, finding that there is a need for a separate Director for Rajgir Zoo Safari to carry out its project implementation as per design, a young and dedicated IFS officer Hemant Patil was posted as Director, Rajgir Zoo Safari and as site incharge. He was fully dedicated to the work, focused on outcomes, and was always oriented towards effective solutions. His brilliant analytical and newly acquired technical knowledge enabled him to carry out assigned tasks with high efficiency.

The development of Rajgir Zoo Safari had to face a number of critical issues during its implementation phase. The issues were mitigated with the number of field visits and series of discussions. Some of the main issues that were faced during the implementation of the project were:

- Undulating Topography of the area: The area proposed for Development of Rajgir Zoo Safari is highly undulating in nature with close contours. This undulating terrain created gaps proposed drawings and actual work site conditions. Thus, on-site decision-making was necessary at each difficult site, after inspection of the site every time. This stretched the project implementation timeline.
- Diversity of Work: Development of Zoo Safari was highly specialized work which varied from the Wildlife health and nutrition management to the

provision of international level facilities to the tourist to facilities for better operation and management of the safari. Thus, at one time, all these works were going on which required manpower of that extent.

- Lack of experience for Construction agency to carry out wildlife-related work led to constant orientation and sensitization of the construction agency and field workers, to make them understand that life of tourists, animal keepers, and animal depends upon the strength and standard of work. Thus, carrying out constant field visits was necessary to ensure that the work is of high standards as per required specifications.
- Covid-19 hampered the speed of the development work with the upsurge of Covid-19 since March 2020. It was difficult to get sufficient manpower and ensure a smooth supply of necessary construction material for the work during the first and second waves of Covid.

## RAJGIR ZOO SAFARI: DESIGN STRATEGY & AN OVERVIEW

Rajgir Zoo Safari, which spreads over around 191 Ha of forest land, is divided into three zones namely, Safari Zone, Reception and Orientation Zone, and Management Zone.

### DESIGN STRATEGY

The Rajgir Zoo Safari has been designed with the vision of the Hon'ble Chief Minister, Bihar, to provide better facilities to the wildlife and for better wildlife management. In this light, efforts have been made to create maintenance-free facilities with a major emphasis on the health and hygiene of animals housed in Rajgir Zoo Safari. Also, safety and security of the animals as well as animal keepers have been given paramount importance with consideration of very minute details in addition to the norms and guidelines established by the Central Zoo Authority. The effort has been made to retain the natural forest landscape and to give maximum possible space to the wild animals, which makes this safari unique. It also provides near-natural habitat to the wild animals housed here.

### RECEPTION AND ORIENTATION ZONE

Different factors like possible visitor count at one point, crowd management techniques, cultural and religious importance of the area, natural landscape available, orientation of visitors, single-directional visitor circulation, and future scope of expansion were considered during the development of this zone. Each and every facility is constructed after giving detailed thought about present and future requirements. The facilities were decided to be constructed merging the

natural landscape. With the thought of interpreting the visitors especially children at the entry point itself, life-size bronze statues of the animals to be shown inside are depicted in the reception area. Sufficient landscaping area is provided for crowd distribution. Sufficient parking facility has been created to cater to the parking demand in the next 20 to 25 years.



► Reception Area

The decision of keeping two different plazas was taken for effective distribution of visitors and to avoid overcrowding at any one particular area. Sufficient signages are in place at different locations to help and guide visitors. A sufficient number of washrooms are available for the visitors. Government guidelines for making facilities differently-abled friendly have been followed with letter and spirit while developing these facilities. Other facilities like children's park, open theatre, and aviary have been widely spaced. The finishing material like ceiling, flooring, etc. used in creating these facilities are used as per surrounding forest landscape. Each and every aspect of tourist management is being considered while the construction of this visitor zone.

Entrance plaza is kept bigger with maximum facilities. Facilities like Ticket Counter, Interpretation Centre, 180 Degree theatre, and washrooms are available in Entrance Plaza. Sufficient use of technology is ensured keeping in view the children and their liking towards audio-visual means of learning. Facilities like Animal information videos, Digital butterfly zone, Shapatha Stambha, Rotoscope, 180-degree theatre, and online ticket booking were included as a part of IT facilities that are made available to the visitors.



► Digital Butterfly Zone

For effective tourist management, the state-of-the-art control room has been developed for better control and coordination among staff as well as for better tourist and wildlife management. The complete area is under CCTV surveillance to ensure effective crowd management. Multiple communication methods in the form of intercom, Wireless base stations are created to coordinate with this control room. Facility of Zonal Public announcement for different Zones is provided for dedicated announcements and public address.



► Control Room

The entertainment of the tourists has also been taken care of by developing a 180 Degree theatre, which is itself a unique feature of Rajgir Zoo Safari. Facilities like Children park and open theatre are also provided in the reception area for kids.



► 3D 180 Degree Theatre

The interpretation center not only gives information about the animals housed in the safari, but it also gives information about other concepts related to the evolution of the earth, the evolution of human beings, as well as the theory of ecological succession in addition to the animal information. The poster series on the wall gives information about the Forest, Wildlife, Forest and Human co-existence, Hazards like habitat fragmentation, forest fires, oil spills and its effect on wildlife, Effect of climate change and Role of Forest department in mitigation and conservation role.



► Interpretation Center

Safari plaza is planned in such a way that all the tourists are oriented before boarding the safari buses. Thus, an orientation room is developed, where basic information about the animals housed in the safari and facilities being provided as communicated along with dos and don'ts to be followed during the safari. There is one-way circulation of safari bus with different pickup and drop points.



► Orientation Hall

### SAFARI ZONE

Rajgir Zoo Safari has five different safaris namely Herbivore, Bear, Leopard, Tiger, and Lion Safari. Enclosures of all the animals including its retiring rooms have been constructed as per CZA norms and guidelines and have been widely appreciated by CZA officials as well as other wildlife experts working in in-situ and ex-situ conservation of wild animals.



This safari has a natural forest which has the advantage of providing near-natural habitat to wild animals and hence can be seen in good health and vigor. Thus, to capitalize on this resource, strict efforts have been made to make minimum intervention in alteration of the natural vegetation and terrain while carrying out the construction work.

The animal displayed in Herbivore Safari includes Sambhar, Chital, Hog Deer, Barking Deer, and Blackbucks. There are sufficient numbers of Sloth Bear, Leopards as well as Tigers and Lions for better citing of these wild animals.

Considering the extreme climatic conditions of Rajgir and for better wildlife management, a sufficient number of windows and ventilators have been ensured for proper ventilation and sunlight in the retiring rooms. UPVC Glass windows have been used for proper

sunlight. It has been made eco-friendly with the use of Solar rooftops and solar water pumps to negate the dependency on the regular power supply.

Use of 304-grade mat-finished stainless steel to fabricate cells, use of rough-surfaced Kota stone on flooring for easy cleaning, U-shaped open drainage for water-free drain, specialized post-box style feed windows with sliders, specialized gear box-based drop gate lifting mechanism with the facility of break system, Stainless steel transportation cages, portable squeeze cages, preinstalled weighing bridges in each retiring room, separate Keeper room with CCTV monitoring facility, store room, etc are some of the best practices adopted while developing the retiring rooms for animal well-being as well as to ensure the safety of animal keepers.



- Interior of Retiring Room- SS Cells, CCTV Cameras for monitoring, Use of Kota in Keeper's Gallery, Gear-Box based drop gate lifting mechanism & Post Box feeding window

Sufficient numbers of Kraal have been provided as per CZA guidelines with evergreen trees for shade, bigger ponds and Wooden Machans. The area of the Kraals has been kept sufficiently larger for animals to stroll and to adjust the big trees that were already present in the area. Wastewater treatment facility is installed in each retiring room to reuse the water for plantation.



- Larger Kraals for animals



- Kraal with shade, Machan and pond

The specially developed Tata GI chain link and GI poles have been used in enclosure boundary to make it maintenance-free and to avoid the problem of breach of enclosure due to rusting etc. The roads are kept sufficiently wide so that any emergency situation like

rescue or fire emergency can be easily handled. Most of the roads are murrum roads to maintain the feel of natural wildlife safari.



- Herbivore Double Gate with theme of "Nalanda Ruins"



- Outer Boundary along with Enclosure Boundary and Roads

The double gates designed with sufficient length, width, and height. The gates are motor operated. The operator room has glass window on three sides for better visibility. CCTV monitoring is carried out to keep constant watch on animal movement near double gates. Additional emergency gate is provided in each enclosure.

Habitat enrichment work of enclosures as per the special need of the particular wild animal has been carried out. Works like plantation of mixed species and fruit-bearing species, removal of weeds, creating of new grasslands and maintenance of old grasslands are being carried out in the herbivore enclosure. The widening and enrichment of water bodies has been ensured along with soil and moisture conservation work to reduce the speed of water and to retain maximum rainwater in natural ponds.



- Natural Pond in Herbivore Safari with check dam



## WILDLIFE HEALTHCARE AND NUTRITION FACILITIES

Generally, in zoos, the management zone of the zoo is a neglected part being out of visitor's reach. While construction of Management Zone of Zoo Safari, equal importance is given in deliberation and thought process as is given for Safari and visitor zone. The healthcare facilities developed here namely Wildlife Hospital, Commissary, Quarantine facility and Post Mortem Hall, were designed based on its effective utilization and keeping in mind its impact on the health of wildlife. The locations of these facilities are such that they are neither too far nor too close to each other. Factors like sunlight, ventilation, ease of operation, and maintenance are considered while developing management zone facilities.

### HOSPITAL

Rajgir Zoo Safari has a state-of-the-art hospital spread in around 784.73 sq. mtrs with modern machineries for diagnostic and treatment and necessary facilities to carry out any major operation.

The hospital building is divided into two parts with both parts facing each other. One part is of the animal treatment section comprising the Operation theatre, X Room, Observation room, Ultra sound room, Nursery for Hand rearing, and Cells and Kraals to be used to house inpatient animals. These rooms are interconnected to each other for easy movement of wild animals for diagnostic and treatment. The other part of the hospital is concerned with the administrative part of the hospital with facilities like Lab, Pharmacy, Staff Rooms, and Store Rooms. These facing wings of the hospital will help in easy monitoring of the animals being treated in the hospital as well as hand-reared in the Nursery. CCTVs have been installed in all rooms especially in-patient ward cells and Kraals to keep 24X7 watch on animals being treated avoiding unnecessary human interaction with them while monitoring of animal under treatment.

Sufficient greenery is ensured in and around the hospital. The orientation of the Hospital building is kept in such a way that sufficient natural sunlight is provided to the animals kept in the kraal. Also, better aeration in the building has been ensured.



► Kraal facility (East facing) in Hospital Building

The medical equipment and facilities available in Wildlife Hospitals are of international standards and have been seen very helpful in the treatment of animals especially old aged and rescued injured animals.

### COMMISSARY

Commissary building of the Rajgir Zoo Safari has separate Veg and Non-veg sections and they have been separated from each other within the same building with sufficient distance between the two.

The Non-veg section has a facility of cold storage of feed, along with beef preparation room and fish and chicken preparation room. Also, veg section store has sufficient space to store minimum 15 days of ration in case of any emergency situation. The veg section of the commissary has separate mash storage and preparation, fruit and vegetable store and preparation, dry ration store, Kitchen along with staff room and office.

There is a separate weighing bridge for weighing of the feed brought by heavy vehicles. Also, grass storage shade has also been constructed at a distance from commissary to avoid rat menace. The facility of entry of heavy vehicles is also provided in the central courtyard of the commissary. Also, a closed delivery vehicle is used for supply of non-vegetarian food material.



► Aerial View of Commissary Building

### QUARANTINES AND POST MORTEM

The separate quarantine facilities for Herbivores and Carnivores have been created inside management zone to cater transferred as well post-treatment recovery of the animals during their prescribed quarantine period.

The separate postmortem facility with sufficiently large post-mortem room as well as sample collection room has been constructed in the Rajgir Zoo Safari. A glass wall facing the sunlight which is the best natural disinfectant. A sufficient number of windows have been provided to ensure proper aeration of the room to keep the room dry.



► Aerial view of Carnivore Quarantine

## ADMINISTRATIVE BLOCK AND EMERGENCY RESPONSE MEASURES

The administrative block with conference hall and separate building for research and monitoring work has been strategically located so that officials can reach tourist reception zone and other facilities of management zones like hospital, commissary as well as safari zone in minimum time for their routine management work as well as in case of any emergency. Dedicate fire tenders, high rise emergency vehicle and ambulance along with rescue vehicle and tractor is procured by safari management to reduce response time in case of emergency and to reduce the impact of any sort of emergency.

Other facilities like emergency response equipment, electrical and solar systems are in place according to need. Waste disposal systems in form of Vermi compost units, waste water treatment plants are operational and bio-medical waste is being disposed of through the authorized agency for incineration of these waste.

## PRESENT AND FUTURE

It is satisfying to see that we are able to operate and maintain this safari not only as per our expectations but it is also being appreciated by local as well as

international tourists visiting Rajgir Zoo Safari.

Rajgir Zoo Safari is providing employment to more than 500 families directly and much more indirectly. New hotels and restaurants are coming up after the start of Zoo Safari. The greenery of the area is increasing and positive changes have been seen in the ecology of the area, which is evident from the fact that Sal regeneration can be seen on the foothills and is increasing uphill eventually.

The main challenge for any high standard facility, once created, is its effective maintenance and operation. The response of the visitors to Rajgir Zoo Safari has been tremendous and the responsibility now shifts to keeping these facilities neat, clean, and operational. More than two thousand visitors along with school children visit Zoo Safari premises every day. Thus, the team of Rajgir Zoo Safari is working constantly to live up to the expectations of visitors. The development of facilities like Souvenir shop etc. is under process. Such facilities need constant up-gradation to come true to the expectations of visitors.

Apart from visitor management, Rajgir Zoo Safari is in nascent stage considering wildlife management part. Future plan involves active Lion and Tiger breeding efforts to supplement in-situ conservation initiatives of Bihar Government. Creating satellite facility of One Horned Rhinoceros and Ghariyal Breeding Conservation Centre of Sanjay Gandhi Biological Park, Patna is in pipeline. Efforts are needed for carrying out research and outreach activities to convert itself into center of excellence in Wildlife Research.

The Government of Bihar is committed and working for the conservation and protection of the natural resources of the State with active participation of the people. The Rajgir Zoo Safari is yet another step of the Government of Bihar for awareness and education of the masses to conserve, protect, preserve and live in harmony with nature.



► Aerial View of Administrative Block

# ZOO IN FOCUS- INTERNATIONAL

Text & Photos: **TIERPARK BERLIN, GERMANY**

## ZOOLOGICAL GARDENS OF BERLIN

The German capital is known for being diverse – As a result of its history as a divided city, Berlin is the only place in Germany to have two large zoos – Zoo Berlin in the former West Berlin, and Tierpark Berlin in the eastern part of the city. It is home to around 8.000 animals from more than 600 different species.



## TIERPARK BERLIN HISTORY

On 2 July 1955, the Tierpark Berlin opened on the site of the historic Friedrichsfelde manor gardens. It owes its extraordinary animal population to a special historical circumstance: for decades, the Tierpark functioned as a transit and quarantine station for animal species from the former Soviet Union to the West. Many animals from this country stopped at the Tierpark before they were allowed to travel on from Berlin – some of them stayed.

## BREEDING SUCCESSSES

Over the past 70 years, animal care takers, zoologists and vets have gained experience with many different animal species and have succeeded in reproducing many of them, in some cases for the first time in human care. More than 120 Sumatran tigers and 125 Amur tigers have been born at the zoo over the past decades. This shows the overriding goal of Tierpark Berlin: The long-term conservation of endangered animal species.

Tierpark Berlin has also welcomed more than 100 Przewalski's wild horse foals, over 160 European bison calves, 120 Mhorr's gazelle calves and 50 bearded vulture chicks which are also extremely important for species conservation. Some of these young animals born at the zoo have returned to their original habitats as part of reintroduction projects.

Tierpark Berlin also has a tradition in breeding Takins. It was proud to send five Mishmi Takins born in Berlin to Darjeeling zoo in January 2019 – 40 years after the first Takin came to Tierpark Berlin from Asia.

## BERLIN WORLD WILD

"Berlin World Wild" the conservation programme of Zoo and Tierpark Berlin support more than 30 different in-situ projects all around the world. With its sponsorship programme it helps young conservationists around the world to proceed in their professional development. The youth programme is focussed on rewarding outstanding citizen conservation projects of school classes in Berlin.

## VISITOR EXPERIENCE TODAY

Tierpark Berlin takes its over 1,5 million annual visitors on a journey around the world: Since 2022 the Himalayan mountain habitat is home to snow leopards, takins, François' langurs, and colourful Himalayan monals. In 2023 opened the African Savannah, giving herds of Grévy's zebras, white-bearded wildebeest and Thomson's gazelles approximately 40,000 m<sup>2</sup> of varied landscape to roam. One particularly special feature of the Savannah is the 120-metre-long giraffe trail with its eight-metre-long suspension bridge, where visitors can have a face-to-face encounter with the herd of rothschild's giraffes.



# ZOO IN HISTORY

## GANDHI ZOOLOGICAL PARK, GWALIOR, MADHYA PRADESH

Text & Photos: **GANDHI ZOOLOGICAL PARK, GWALIOR, MADHYA PRADESH**

The Gandhi Zoological Park was initially established as a personal zoo by the king of

Gwalior Madhav Rao Scindia in the Year 1902. In the year 1921, the king of Gwalior by the Prince of Wails Zoological Park, Lucknow opened this personal zoo for the public. In 1922 on the occasion of Georg's visit Georg, the zoo was named King Georg zoo in his honour.

Since that time (1922) this zoo has been operated by the Municipal Corporation Gwalior. After the independence, the zoo was renamed as Gandhi Zoological Park in the honour of father of nation Mahatma Gandhi. Today it is classified under the small zoo category by the Central Zoo Authority.

The Vision of the Gandhi Zoological Park is to end the human and wildlife conflict by educating the public

about the importance of wildlife in the ecosystem through bringing the wildlife and humans closer along with maintaining the highest standards of animal care and comfort. Further, the mission of the zoos is to create awareness about wildlife by giving a chance of exposure with wildlife to civil society in a close and natural environment with minimum disturbance and discomfort to the animals.

Gandhi Zoological park is situated on 10 hact. of green belt land in the heart of the Gwalior city. It attracts tourists and visitors from all over central india. With time it emerged as a center of excellence for wildlife conservation, research and awareness. At present the zoo has 52 enclosures having wild animals of 60 different species and provides upkeep and healthcare to these animals for their conservation.





## **CENTRAL ZOO AUTHORITY**

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