



सत्यमेव जयते

Government Of India



Central Zoo Authority
केन्द्रीय चिड़ियाघर प्राधिकरण

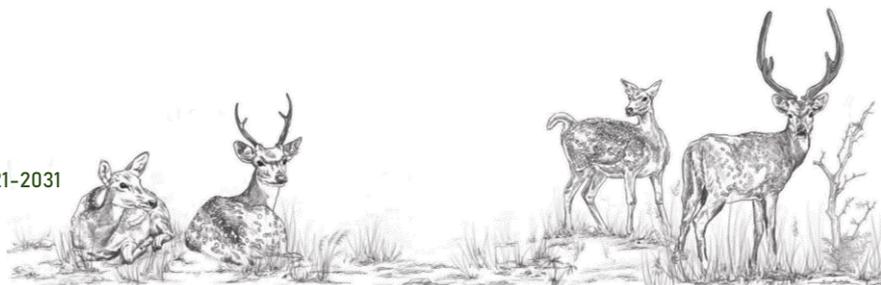
Vision Plan for Indian Zoos and Strengthening of Central Zoo Authority 2021 - 2031



Disclaimer

Facts and statistical inputs in this document have been made available by various zoos in the country. Central Zoo Authority has articulated these in this document with the assistance of acknowledged experts in the field. This document is a prescriptive document only to assist the zoos in designing their plans in the local context.

Suggested Citation: Vision Plan -Zoos (2021) Vision Plan for Indian Zoos and Strengthening of Central Zoo Authority (2021-2031). Ministry of Environment, Forest and Climate Change, Govt of India.



Vision Plan for Indian Zoos and Strengthening of Central Zoo Authority 2021 - 2031



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GOVERNMENT OF INDIA

भूपेन्द्र यादव

BHUPENDER YADAV



MESSAGE

I am pleased to write this foreword for the very important Vision Plan 2021-2031 put forth by the Central Zoo Authority (CZA), New Delhi.

The Government of India has always recognised the importance of zoos and the actions undertaken by them. The Government of India has also heavily emphasised on the modernisation of Indian Zoos, and it encourages all Indian zoos to function at par with global standards.

The Central Zoo Authority was established in the year 1992 with an amendment to the Wildlife (Protection) Act, 1972, to oversee the functioning of zoos in the country and provide them with technical and other assistance for their management.

The Central Zoo Authority is working in this direction, and it has been the endeavor of the Central Zoo Authority to ensure that zoos in India are enabled to function at all fronts, keeping in mind the best practices in zoo management globally. It is important to have strong guiding document which will make all the stakeholders aware of the importance of zoos in India and in return with encourage participation from the citizens.

I hope the Vision Plan Document 2021-2031 will help zoos and encourage them to adopt the best captive animal care standards in the country.

I further congratulate all the officers of CZA, and various experts involved in bringing out this comprehensive Vision Plan. I am sure the implementation of this Vision Plan 2021-2031 document will add value in the work done for ex-situ wildlife conservation in India.

With best wishes.

Date: 02.10.2021

(Bhupender Yadav)



सत्यमेव जयते

आहारशुद्धौ सत्त्वशुद्धिः



एक कदम स्वच्छता की ओर

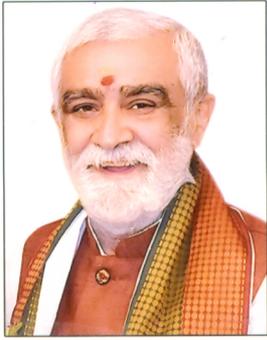
राज्य मंत्री

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अश्विनी कुमार चौबे
Ashwini Kumar Choubey



संदेश

मुझे प्रसन्नता है कि केन्द्रीय चिड़ियाघर प्राधिकरण ने भारत के चिड़ियाघरों एवं केन्द्रीय चिड़ियाघर प्राधिकरण को सुदृढ़ करने के लिए एक बहुत व्यापक दृष्टि योजना दस्तावेज़ लाया है।

यह व्यापक दस्तावेज़ “भारतीय चिड़ियाघरों के परिवर्तन का नेतृत्व करने, वैश्विक वन्यजीव देखभाल के समान कार्य करने के लिए अत्याधुनिक अनुसंधान और प्रौद्योगिकी के साथ विज्ञान का सम्मिश्रण, कल्याण एवं संरक्षण मानक” में मदद करने के अपने दृष्टिकोण को पूरा करेगा।

यह दृष्टि योजना दस्तावेज़ (2021-2031) चिड़ियाघरों के सामने आने वाले सभी अंतर्निहित चुनौतियों का संज्ञान लेता है, और सफल कार्यक्रमों और पहलों की नींव रखता है जो चिड़ियाघर एक्स-सीटू संरक्षण के लिए उठा सकते हैं। साथ ही साथ, केन्द्रीय चिड़ियाघर प्राधिकरण और चिड़ियाघरों में संरक्षण प्रजनन पहल, अनुसंधान और स्थायी कार्यों को बढ़ावा देने की वैज्ञानिक समीक्षा का समर्थन करता है।

मैं केन्द्रीय चिड़ियाघर प्राधिकरण और विशेषज्ञों को, जिन्होंने इस दृष्टि योजना दस्तावेज़ का मसौदा तैयार करने में महत्वपूर्ण इनपुट/ प्रयास किए हैं, सक्रिय रूप से शामिल होने के लिए अपनी शुभकामनाएँ देता हूँ।

(अश्विनी कुमार चौबे)

॥ प्लास्टिक नहीं, कपड़ा सही ॥

Table of Contents

Executive Summary	i
1. Introduction	3
2. Approach	7
3. Vision Framework and Pillars	9
4. Zoo Vision Plan 2021-2031	12
5. CZA Vision Plan 2021-2031	46
6. Annexure A: Timelines for achievement of Vision Pillars	61
7. Annexure B: Summary of financial outlay for next 10 years	62
8. Annexure C: Supporting information for Zoo Vision Plan	66
9. Annexure D: Supporting information for CZA Vision Plan	90
10. Annexure E: Supporting information for 15 Zoos Vision Plan	104

Executive Summary

India, home to unique wildlife habitats and species, is characterized as one of the mega-biodiverse countries in the world. India occupies only 2.4% of the world's land area, yet accounts for 7-8% of all recorded species, including over 45,000 species of plants and 91,000 species of animals¹, protection of which is key to sustainable development.

As per the National Zoo Policy of 1998, primary mandate of the Central Zoo Authority (CZA) is to complement and strengthen national efforts in conservation of the rich biodiversity of the country. In this vein, CZA has come forward to formulate a vision plan aimed towards achieving global standards at Indian zoos.

Zoos are centers for ex-situ conservation and learning. Indian zoos could benefit from a renewed commitment to excellence, particularly with respect to training and capacity development, strengthening financial sustainability, and building education and research opportunities.

Vision Plan 2021- 2031 is a strategy of transformation for Indian zoos that lays out a roadmap for change. The plan is committed to making Indian zoos a greater force for conservation by providing unparalleled animal care, cutting edge research, and immersive visitor experiences that strike meaningful chords with people of all ages.



Lead the transformation of Indian Zoos, blending science with cutting-edge research and technology to function at par with global animal care, welfare and conservation standards"

Together with the zoos, partner institutes and enthused teams, spread throughout the country, the plan envisions Indian zoos to be catalyst of transformation, build on history of innovation and leadership. It strives to deliver experiences that inspire visitors to take conservation action and affirm deeper community connect.

¹ Convention on Biological Diversity, India Country Profile. <https://www.cbd.int/countries/profile/?country=in>

The plan echoes the following 'Pillars of Change' anchored across goals of conservation breeding, animal welfare, scientific research, visitor experience and education, sustainability, elevated teams and technology driven institutions, for CZA as well as zoos.

- | | | | | | |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------|
|  | 1. Strengthening ex situ conservation of endangered native species |  | 2. Maximise animal welfare |  | 3. Advance management of rescued animals |
|  | 4. Catalyze science-based conservation action |  | 5. Function as lifelong centres for learning |  | 6. Enhancing visitor experience |
|  | 7. Infrastructural upgradation, incorporating environmental sustainability measures |  | 8. Build financially sustainable business models |  | 9. Develop skilled, motivated and empowered teams |
|  | 10. Leverage technology to expand outreach, impact and overall efficiency | | | | |

Each Pillar of Change will be realised through specific initiatives that 'Calls for Action' to key stakeholders (CZA and Zoos). The plan also chalks out specific targets and timelines for these 'Call to Action' to be realised across period of 10 years. The financial outlay of plan is estimated for CZA and zoos annually as well as for period of 10 years.





1

Above: Lakeside view of Nandankanan Zoological Park, Bhubaneswar Odisha, as seen from the State Botanical Gardens. *(Picture Credit: EY)*

1. Introduction

In the last century, population growth and consequently rapid urbanization and loss of natural habitats have put unprecedented strain on the planet's biodiversity. Multiple studies have documented the ways in which human beings have influenced ecosystems — accelerating extinctions and reasserting species distributions.² More recently, pandemics like COVID-19 have emphasized the direct link between the destruction of nature and various disease outbreaks, and the interconnectedness of human health and the environment. It has also made apparent that safeguarding our natural world is essential for social and economic development.

India is home to unique wildlife habitats and species, the protection of which is key to sustainable development. Characterized as a mega-biodiverse country, India occupies only 2.4% of the world's land area, yet accounts for 7-8% of all recorded species, including over 45,000 species of plants and 91,000 species of animals.³

What role can zoos play in biodiversity conservation?

Zoos are centers for ex-situ conservation and learning. As per the National Zoo Policy of 1998, the primary objective of a zoo is to complement and strengthen national efforts in conservation of rich biodiversity of country, particularly the fauna. This can be achieved through the following:⁴

- 1) Supporting conservation of endangered species by giving species that have no chance of survival in wild, a last chance of survival through coordinated breeding under ex – situ condition and raise stocks for releasing them in wild as and when it is appropriate and desirable.
- 2) To inspire amongst zoo visitor's empathy for wild animals, an understanding and awareness about the need for conservation of natural resources and for maintaining ecological balance,
- 3) Providing opportunities for scientific studies useful for conservation in general and creation of database for sharing between the agencies involved in ex – situ and in – situ conservation.
- 4) Function as rescue centres for wild animals where animals are housed till the signs of distress/disease are alleviated and the animals can be rehabilitated and acclimated for release in the wild with the best chance of survival.

Zoos in India

Descendants of a rich cultural tradition of wildlife care, Indian zoos are uniquely positioned to become some of the best in the world.⁵ Concerted efforts of various stakeholders in the last few decades have helped put in place some of the legislation, support and resources necessary for zoos to achieve global standards. In 1991, the Indian Parliament enacted the amendment of the Wildlife (Protection) Act, which provided for the enforcement of mandatory standards and norms for management of zoos through the Central Zoo Authority. Subsequently, the Recognition of Zoo Rules (RZR) was drafted, outlining the norms for the establishment and

² Staples, Timothy & Kiessling, Wolfgang & Pandolfi, J.. (2020). Increased extinction in the emergence of novel ecological communities. *Science*. 370. 220-222. 10.1126/science.abb3996. <https://science.sciencemag.org/content/370/6513/220> See also UN 2020 Human Development Report: The Next Frontier: Human Development and the Anthropocene. <http://hdr.undp.org/sites/default/files/hdr2020.pdf>

³ Convention on Biological Diversity, India Country Profile. <https://www.cbd.int/countries/profile/?country=in>

⁴ National Zoo Policy, 1998

⁵ The Indian tradition of animal conservation has also been noted in R. Rajamani, 'Relevance of Zoos in Developing India', in *Indian Zoo Yearbook*, Vol. III (2000). Page 7.



scientific management of zoos. In 1998, the National Zoo Policy was formed, giving proper direction, and thrust to the management of zoos by mustering co-operation and participation of all concerned.⁶ In addition, zoos in India are also guided by the Forest (Conservation) Act, 1980 and Forest Conservation Rules, 2003.

Supported by these policy frameworks, Indian zoos have been appreciated for their work globally. Facilities like the Agra Bear Rescue Center in Uttar Pradesh and the Madras Crocodile Bank and Centre for Herpetology in Tamil Nadu have gained recognition for their pioneering work. The Agra Bear Rescue Center, established by Wildlife SOS in collaboration with the state forest department, is the largest Sloth bear rescue facility in the world. Madras Crocodile Bank played a leading role in forming the Gharial Ecology Project, helping inform gharial conservation efforts within the subcontinent as well as beyond.⁷ Madras Crocodile Bank has also established two permanent field stations and the team conducts research across the country: in Maharashtra, Karnataka, Gujarat, Chhattisgarh as well as the Andaman Islands.

Increasingly, many threatened species are dependent on continuing management for their survival. In the last few decades, conservation breeding efforts carried out with the support of zoos have borne considerable fruit. Noteworthy successes include *ex-situ* conservation of Asiatic Lions in Gujarat with the support of Sakkarbaug Zoological Park, Red pandas and Snow Leopards at Padmaja Naidu Himalayan Zoological Park, Darjeeling, Mousedeer at Nehru Zoological Park, as well as Western tragopans at Himalayan Nature Park and Sarahan Pheasantry in Himachal Pradesh. Many more conservation-breeding programs are currently being conducted at zoos across the country, culminating in successful reintroductions into the wild.

India has also made an innovative and unique contribution to the global zoo community in the form of the “biological park” design. The biological park is characterized by its naturalistic, open design, focus on indigenous animals and national park like feel.⁸ Some well-known examples of the biological park include Nehru Zoological Park in Hyderabad; Indira Gandhi Zoological Park in Vishakhapatnam, Sri Venkateshwara Zoo in Tirupati and Bannerghatta Biological Park in Bengaluru. Influenced by biological parks, various other zoos across the country have also prioritized principles of open design.

Central Zoo Authority

As the statutory regulatory body for zoos, CZA has played an instrumental role in spearheading many efforts to improve Indian zoos, particularly through its monitoring mechanism and processes that has helped to bring many travelling zoos, circuses and illicit operations under legal purview. Since its inception, CZA has played a pivotal role in the closure of 300+ zoos that failed to meet the prescribed standards.⁹ In addition, CZA organizes various capacity development workshops for zoo personnel and provides financial support for conservation-breeding and research programs. More recently, CZA and Wildlife Institute of India (WII) have drafted guidelines adapting the Management Effectiveness Evaluation Process (an established standard for protected areas) for zoos, thereby improving the current evaluation process in a manner which is discrete, holistic as well as independent.¹⁰

⁶ National Zoo Policy, 1998.

⁷ Gharial Ecology Project Update 2018-19.

⁸ Sally Walker, ‘Zoological Gardens of India’ in *Zoo and Aquarium History: Ancient Animal Collections to Zoological Gardens*. Page 305.

⁹ Opening address by DG Forests and Special Secretary at the WAZA Annual Conference in New Delhi (2014)

¹⁰ Management Effectiveness Evaluation of Indian Zoos (MEE-ZOO): Guidelines, Criteria and Indicators for Evaluation of Zoos through Management Effectiveness Evaluation Process (2020).



In addition, many zoos have sought support from their global counterparts, bettering themselves through formal arrangements with some of the leading institutions worldwide. Currently, eight Indian zoos are members of the World Association of Zoos and Aquariums (WAZA). In 2014, the annual WAZA conference was held in New Delhi, bringing the global zoo community to Indian shores.

Despite encouraging progress in several areas, Indian zoos could benefit from a renewed commitment to excellence, particularly with respect to training and capacity development, strengthening financial sustainability, and building education and research opportunities. In this vein, the Central Zoo Authority (CZA) has come forward to formulate a vision plan aimed at achieving global standards at Indian zoos.

Why a vision plan?

Looking ahead, this report outlines a common vision for Indian zoos in the next decade:

“Lead the transformation of Indian Zoos, blending science with cutting-edge research and technology to function at par with global animal care, welfare and conservation standards”.

With this vision, the major aim of this plan is to stimulate a national discussion regarding the goals and strategies needed to ensure that Indian zoos thrive as world-class conservation centres, embracing the function of modern zoos: recreation combined with conservation.

It is acknowledged that owing to the diversity of size, climate, cultural context and other considerations, there is no one-size-fits-all list of recommendations for all 153 zoos. Within the pillars of change outlined below, some recommendations and call to actions might not apply to all zoos. The recommendations should take into account local context and priorities, and there is also much to be gained from individualized plans that map day-to-day functioning to the recommendations of this vision plan.





Above: *Painted Storks*. Image taken at M.C. Zoological Park, Punjab during EY Site Visit October 2020

2. Approach

The strategic planning process for Vision Plan formulation comprised of 3 stages – framing of approach and methodology, assessment of existing situation and lastly, formulation of Vision Plan. At the onset, a Vision Planning Committee was formed that directed and guided the entire exercise. The entire process was spread across 10 months involving members from key government organizations, select zoos, subject matter experts and professionals.

In order to frame a Vision that is comprehensive and rooted in collective spirit, extensive stakeholder outreach was undertaken through various means. Over fifteen one on one detailed interviews were conducted with experts hailing from fields of wildlife conservation, botany, zoology, veterinary sciences, journalism, zoo – architecture, and others. Field visits were undertaken to over twelve zoos across the country and data was received in questionnaire formats. A survey was floated to capture visitor perspectives and motivations that fetched over 7,000 responses from people of all age groups, sharing their experiences and expectations for Indian zoos.

Guided by stakeholder input and organizational data, key challenges were identified that were shaped into ten Pillars of Change over the course of series of meetings and workshops. The Pillars of Change were drilled down into tangible 'Initiatives' and 'Call to Actions' for ensuring realisation of the Vision. The aspirations, views and ideas drawn from noteworthy experts and field studies form the basis of the Vision Plan.

Important: Further, with the Vision remaining uniform, the Pillars, tangible 'Initiatives' and 'Call to Actions' have been detailed separately for Indian Zoos and Central Zoo Authority.

1

Framing of Approach and Methodology

- Design thinking methodology
- Consultative approach
- Leveraging teams across the country

2

Assessment of existing situation

- Research on leading practices based on zoos worldwide
- Study of existing literature – Policies, Acts, Regulations, Guidelines, Master Plans, Annual Reports, etc.
- Field based data collection, including site-visits and meetings
- Visitor experience survey
- Detailed interviews with Vision Plan Committee, Technical Committee, Expert group, other stakeholders
- One – to one reviews with Zoo directors and their teams

3

Conceptualization of Vision

- Iterative meetings with members of Vision Planning Committee
- One to one review sought from key stakeholders
- Survey floated amongst key stakeholders to finalise Vision priorities.





Above: Red Panda (*Ailurus fulgens*) seen at Padmaja Himalayan Zoological Park Darjeeling. *Picture Credit: Padmaja Naidu Himalayan Zoological Park*

3. Vision Framework and Pillars

“Lead the transformation of Indian Zoos, blending science with cutting-edge research and technology to function at par with global animal care, welfare and conservation standards”

CZA Vision Plan 2021- 2031 lays out a roadmap for change to take Indian Zoos to global standards. The plan is committed to making Indian zoos a greater force for conservation by providing unparalleled animal care, cutting edge research, and immersive visitor experiences that strike meaningful chords with people of all ages.

Together with the zoos, our partner institutes and our employees spread throughout the country, the plan envisions Indian Zoos to be catalyst of transformation, build on history of innovation and leadership. It strives to deliver experiences that inspire visitors to take conservation action and affirm deeper community connect.

Pillars of Change

The plan echoes ten ‘Pillars of Change’ anchored across goals of conservation breeding, animal welfare, scientific research, visitor experience and education, sustainability, elevated teams and technology driven institutions. Each Pillar of Change will be realised through specific initiatives that call for action to key stakeholders.

All the Pillars of Change are pivotal in achievement of the vision and each needs to be addressed on priority basis. The initiatives and their ‘Call of Action’ provide meaningful and tangible action that will guide member institutes in driving transformation of change

Zoo Pillar	CZA Pillar
1. Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	1. Strengthening ex situ conservation of endangered native species guided by National Zoo Policy and adoption of the One Plan approach.
2. Optimize animal welfare to achieve parity with concurrent global policies	2. Maximise animal welfare at par with global standards
3. Management of rescued animals	3. Advance management of rescued animals through updation of policy and guidelines
4. Catalyze science-based conservation action in zoos	4. Catalyze science-based conservation action in zoos
5. Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	5. Steer zoos to function as learning institutions by (having a) long-term conservation education plan as part of the Master Plan
6. Enhance visitor experience through immersive and inclusive design	6. Establish an experienced team of ex-situ conservation management personnel.
7. Leverage technology to expand outreach, overall efficiency and improve animal welfare	7. Infrastructural upgradation, incorporating environmental sustainability measures
8. Build financially sustainable business models prioritizing fiscal autonomy while being aligned	8. Build financially sustainable business models prioritizing fiscal autonomy while being aligned



<p>with goals of biodiversity conservation and animal welfare</p> <p>9. Develop skilled, motivated and empowered teams, for all facets of zoo management</p> <p>10. Prioritize infrastructural upgradation, incorporating environmental sustainability measures</p>	<p>with goals of biodiversity conservation and animal welfare</p> <p>9. Support zoos in enhancing visitor experience through immersive and inclusive design</p> <p>10. Leverage technology to expand outreach, impact and overall efficiency of Indian Zoos</p>
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4 ZOO VISION 2021- 2031

Above: Himalayan Black Bear seen at Rajkot Zoological Park, Gujarat. *(Picture Credit: Bhargav Bhatt)*

4. Zoo Vision Plan 2021-2031

“Lead the transformation of Indian Zoos, blending science with cutting-edge technology to function at par with global animal care, welfare and conservation standards”.

Pillar 1 Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.

Zoo’s play a major role in helping to conserve a species through ex-situ conservation breeding programmes. Collaborations both national and international provide a future for some of the world’s most vulnerable species, especially where education and in situ conservation work are unable to stabilize natural habitats and change destructive behaviours. This is done through cooperative international and regional ex situ breeding programmes to form viable populations that can benefit in situ conservation efforts.

- i. Own the national-level Integrated Conservation Breeding Plan aimed at conservation of native endangered species.

CALL to ACTION: Take the lead for creating successful linkages with in-situ conservation using the One-Plan approach

Target: Overall CTA to be achieved by 2031 starting 2021

- ▶ Annual review of all ongoing conservation breeding programs at all zoos. This may include-
 - a. Creation of a workplan (for assessment) with meeting charter, species experts (ex-situ and in-situ) and tentative dates for identified species- **by 2021**
 - b. Species/ program wise assessment to be compiled in a form of deliverable to be submitted to CZA (expert consultation will be required) - annual submission starting **2022**
- ▶ Proposal for new/ revised ex situ program(s) to be finalized by **2022**. This will include activities such as infrastructure upgradation, onboarding experts etc.

Leading practice: Conservation Breeding and research at Nandankanan Biological Park

At Nandankanan Biological Park, research on conservation breeding of Indian pangolin is actively being conducted in the specially established ‘Indian pangolin conservation breeding centre’. The pangolins are continuously monitored through infrared sensitive CCTV cameras. A total of seven pangolins have been born in the centre so far.

A conservation breeding centre for long billed vultures has also been constructed, and the activity pattern of the birds are monitored through two fixed angle and one PTZ camera with infrared facility.

In addition, seven gharials bred and reared at the zoo have been successfully released into the river Mahanadi in the last year. They are individually marked and fitted with VHF transmitters for future identification and tracking of their dispersal route and survival.

CALL TO ACTION: Raise awareness amongst the general public through specific educational programmes, trainings, workshops as well as signages on endangered and priority species.

Target: Overall CTA to be achieved by 2031 starting 2023



- ▶ *Zoos to update/revise their Conservation Education Plan and integrate them as a part of Master Plan by 2023, for this they should have consultative meetings with experts*
- ▶ *Conduct **half yearly** workshops for dissemination of zoo education to public of different age groups (**starting immediately**)*

Leading practice: Zoos and Endangered Species Conservation: A Concerted Effort to Turn Back the Clock on Extinction

AZA conservation breeding programs (also known as captive breeding programs) are designed to augment populations of endangered species and avoid extinction via regulated breeding in zoos and other approved facilities.

Zoos accredited by the Association of Zoos and Aquariums (AZA) participate in Species Survival Plan Programs that involve captive breeding, reintroduction programs, public education, and field conservation to ensure survival for many of the planet's threatened and endangered species.

Conservation Breeding

Under this program 6 species have been successfully bred in captivity by zoos to augment its population in the wild

Arabian Oryx: Hunted to extinction in the wild, the Arabian Oryx was revitalized due to conservation efforts of Phoenix Zoo and others. As of 2021, 1,000 animals had been restored to the wild, while thousands more were living in zoo environments.

Przewalski's Horse: The only truly wild species left in the world, Przewalski's Horse is native to the grasslands of Central Asia. After being declared completely extinct in the wild, it's made a comeback by Mongolia near Khar Us Nuur National Park.

California Condor: As only 27 of birds left, due to conservation efforts from the San Diego Wild Animal Park and the Los Angeles Zoo, approximately 300 California Condors have been reintroduced into the wild.

Bongo: The Eastern Bongo, a large antelope native to a remote region of Kenya was one of the last large mammal species to be discovered but poaching and loss of habitat nearly wiped them out. AZA Zoos are working to establish a stable population to ensure their survival.

Panamanian Golden Frog: entire species succumbed to the effects of a devastating fungal disease in 2005 Since 2007, existing captive populations abetted by collaborative conservation efforts by Smithsonian's National Zoo & Conservation Biology have staved off their extinction.

Golden Lion Tamarin: Close to extinction due to loss of habitat from logging and mining, as well as poaching in its native Brazil, there has been a steady effort since the 1980s to ensure this species doesn't vanish from the face of the Earth. Currently, about one-third of wild Golden Lion Tamarins come from breeding programs (Golden Lion Tamarin Conservation Program (GLTCP) Smithsonian's National Zoo & Conservation Biology.

- ii. Take up conservation breeding as per assigned role(s) by CZA

CALL TO ACTION: *Secure funding (in addition to CZA grant) and necessary infrastructure for the running the program(s) from the State Govt. and other sources*

Target: *Funding to be secured by 2024*



CALL TO ACTION: Collaborate with international breeding programs such as EEP & SSP.

Target: Overall CTA to be achieved by 2024

Identify the possible international collaborations, along with approvals from government bodies for signing of MOU by 2024.

Pillar 2 Optimize animal welfare to achieve parity with concurrent global policies

- i. Create infrastructure for animal housing based on CZA prescribed standards that account for species-specific biological requirements.

Zoos must aspire to plan for species appropriate infrastructure for animal housing, that can provide for overall wellbeing of the animals. It is the need of the hour to effectively incorporate aspects of 'landscape immersion' (incorporating natural and cultural elements of animals' native land) and 'abstract ecology' (representing elements of animals' native habitat).

CALL to ACTION: Employ novel approaches to enclosure designing (encompassing outdoor areas, holding areas, temporary separation areas like kraals etc.)

Target: Overall CTA to be completed by 2022

- ▶ Engage design experts/ firm from the CZA empanelled professional list by 2022 to assess and conceptualize the new/revised design for enclosures.

CALL to ACTION: Include biological requirements like dens, hides, resting ledges etc. into the design elements of the enclosure and holding areas.

Target: Overall CTA to be completed by 2025

- ▶ Upgradation/ implementation of new/ revised enclosure design by 2025

CALL to ACTION: Introduce remote monitoring using CCTV for reduced disturbance.

Target: Overall CTA to be completed by 2029

- ▶ Zoos to install CCTV in every animal enclosure by 2029

- ii. Adopt husbandry practices as per CZA prescribed standards and any other concurrent global husbandry practices

Global zoo associations have outlined standards for animal husbandry practices- by attempting to create an environment that can support animal's overall wellbeing.

CALL to ACTION: Adopt a modern approach to interventions including those related to husbandry and veterinary sciences to reduce stress. This approach shall:

- Allow expression of the full range of species-specific behavioural repertoire and reduce instances of boredom and stereotypes (e.g. parent rearing, courtship displays etc.).
- provision an appropriate diet that meets holistic nutritional needs of the species.
- positive enforcement of behaviours that facilitate medical examinations and tests, shifting, etc.

Target: Overall CTA to be completed by 2025

- ▶ Engage experts/ firm from the CZA empanelled professional list by 2022 to assess and finalize the improvement.



- ▶ *Implementation of finalized improvements by 2025*

CALL to ACTION: Use observational and/or minimally invasive procedures (e.g. through analysis of fecal samples) to assess stress levels in zoo animals.

Target: Overall CTA to be completed by 2031 starting 2022

- ▶ *Complete analysis in a form a deliverable to be annually submitted to CZA starting 2022*

iii. Develop rigorous record keeping regimes for all individuals housed in the zoos

Information management and recordkeeping is key to effective action in animal care. The zoos must use the mandated software(s). For additional data storage and analysis, zoos may use globally recognised data recording systems or develop and manage programs to suit their needs.

Leading Practice: Electronic platforms for record keeping

In an effort to supplement animal collection records, several institutions and some zoo and aquarium associations have developed additional software¹¹. These are:

- In Germany the company ASPE developed a software package based on the existing software used by state authorities. With this software the user receives all tools for record keeping as in AKS or ZIMS. A further advantage is the indication of all legal issues within the yearly update, making the zoo's database compatible with the inspecting authority
- The Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) developed REGASP, software for managing institutional and regional collection planning data. REGASP is now used by several regional associations.

CALL to ACTION: Achieve 100% marking (permanent) of all the individuals housed in the zoo

Target: Overall CTA to be completed by 2025

- ▶ *All zoos are required to shift towards electronic marking system by 2025*

CALL to ACTION: Ensure maintenance and updating of Animal History Cards for all individuals

Target: Overall CTA to be completed by 2031 starting 2028

- ▶ *Shifting towards digital animal history cards, by 2021, so that the data derived from the card can be directly linked with Information Management System by 2028*
- ▶ *Involvement of consultants by 2022 to develop digital animal history cards that can be directly linked with Information Management System by 2028*

Leading Practice: Record keeping and information management ¹²

Within Smithsonian National Zoo, animals are assigned a "local ID" in the form of an accession number. This accession number uniquely identifies each animal in the National Zoo and is used in each type of

¹¹ Source: https://ec.europa.eu/environment/nature/pdf/EU_Zoos_Directive_Good_Practices.pdf

¹² Record Keeping - Animal Care and Management at the National Zoo: Interim Report - NCBI Bookshelf (nih.gov)



record generated at the National Zoo. The National Zoo generates many types of animal management and husbandry records, including

- **Keeper logs** – generated by the zookeepers to document daily observations of each animal.
- **Curator reports** – generated by the curator, usually weekly, to highlight significant events noted in the daily keeper logs of that week.
- **Specimen reports** – generated by the records keeper within the registrar's office. It is the official history of the animal and documents major events such as birth, death, origin of specimen, medical history, behavioral and husbandry concerns, and location of a specimen (Earnhardt et al., 1998). These reports are generated from information in the curator reports.
- **Nutritionist records** – generated by the nutritionist to document diet management.
- **Veterinary medical records** – generated by the veterinary staff to document the medical care received by an animal, including clinical notes, laboratory results, anesthesia records, and parasitology records.
- **Pathology records** – generated by the Pathology Department to document the examination of tissue or fluid samples as well as the findings of necropsies.

iv. Create a calendar of enrichment activities and interventions.

CALL to ACTION: *Species-specific enrichment and seasonal interventions for animals*

The major considerations while implementing enrichment activities in zoos, are that they must promote species specific behaviour patterns. The enrichments activities can be categorised under social, cognitive sensitive, physical habitat, sensory and nutritional enrichments. Enrichment is essentially a dynamic activity needing specific goals, planning and regular evaluation and “re-adjustment” based on documentation.

Target: Overall CTA to be completed by 2025 starting 2022

- ▶ *Engage experts/ firm from the CZA empaneled professional list by 2022 to assess and finalize the improvement(s)*
- ▶ *Implementation of finalised improvements by 2025*

CALL to ACTION: *Create and periodically update a collection bank of enrichment material comprising of eco-friendly material to enable dynamic enrichment within enclosure spaces*

Target: Overall CTA to be completed by 2025 starting 2022

- ▶ *Experts engaged above can help in identifying natural material that can be used multiple/ dynamic enrichment by 2022*
- ▶ *Identification of storage space and related SOP by 2023*
- ▶ *Stockpile to be created by 2025*

v. Collaborate with global zoological community to advance animal care practices.

Animal care and species conservation through the promotion of animal welfare ethics in zoos is ever evolving and has witnessed a sea-change in the past few decades. The primary objective of collaborations is to promote knowledge exchange and capacity strengthening between the zoos thereby maximizing the conservation activities of zoos globally.



CALL to ACTION: Establishing an MOU with global zoological community to advance animal care practices.

Target: Overall CTA to be completed by 2031 starting 2021

- ▶ Identify global zoological community for possible collaboration by **2021**
- ▶ Organizing workshops with the experts from global zoological community - to begin by **2022** - 4 workshops in a year should be planned

- vi. Build capacity of animal keepers to sensitize them of routine practices and for cases needing specialized care and rigorous monitoring (keeper regimes to manage breeding animals etc.)

CALL to ACTION: Developing a specialized training framework for animal keepers to deliver optimal animal care.

Target: Overall CTA to be completed by 2031 starting 2022

- ▶ Annual trainings to be rolled out by **2022**

- vii. Integrating technology in animal welfare¹³ (covered in detail as a separate pillar under pillar 7)

Pillar 3 Management of rescued animals

Effective management of rescued animals can be achieved through active planning, on-going daily evaluations, and response to changing conditions (of said animals).

- i. Zoos should develop necessary infrastructure to function as rescue centres.

CALL to ACTION: Establish necessary off display infrastructure for quarantine, short-term/long-term care of species commonly rescued from the respective region (e.g. species-specific housing).

Target: Overall CTA to be completed by 2025

- ▶ Assessment of the rescue facilities by each zoo with the help of experts by **2022**.
- ▶ Upgradation of existing infrastructure by **2023**
- ▶ Construction of new infrastructure by **2025**

CALL to ACTION: Ensure implementation of standardised protocols for efficient management of animals upon acceptance in the zoo.

Target: Overall CTA to be completed by 2023

- ▶ SOP adoption by **2023**

CALL to ACTION: Explore possibility of funding from respective State and Central Government Schemes (e.g. CAMPA) for establishment and operation of rescue centre.

Target: Overall CTA to be completed by 2025

- ▶ Assessment of the rescue facilities by each zoo with the help of experts by **2022**.

¹³ Alan Neuringer [1969], demonstrated that when given a choice between “working” for food and having the food provided ad libitum, many animals chose to work for their food. Technology may be incorporated into such modalities to make enrichment dynamic and targeted to behaviours.



- ▶ *Secure funding for upgradation of existing infrastructure by 2023*

ii. Rehabilitation and release of rescued animals

CALL to ACTION: *Ensure that management reduces the degree of habituation to facilitate their subsequent rehabilitation.*

Target: Overall CTA to be completed by 2023

- ▶ *Assessment of infrastructure in the zoos for the release of animals (this may include onboarding of experts) by 2022*

CALL to ACTION: *Create necessary infrastructure to enable pre-release training.*

For the release of animals in the wild, zoos should place the animals in places such as free-flight aviaries, soft-release enclosures etc. to train them for the wild. For this, zoo shall also include changes to their dietary needs (wild diet). This will enable them to adapt to the change in their lifestyle and will make them independent of human aid.

Target: Overall CTA to be completed by 2031 starting 2023

- ▶ *Draft a plan for design and development of such facilities by 2023 (onboarding of design and animal welfare experts empanelled with CZA).*
- ▶ *Construction of such facilities by 2025 (empanelled vendor of CZA)*
- ▶ *Annual review of rescue related infrastructure – starting from 2025 until 2031 (this shall include onboarding of experts)*

iii. Availability of equipment and trained personnel to assist local animal rescue operations

CALL to ACTION: *As part of long-term Master Plan, prepare an SOP (including equipment, personnel responsible, operation protocols) to effectively assist in rescue operations, when needed.*

Zoos shall follow the statutes, policies, SOPs, standards, etc. for the rescue of wild animals and welfare/upkeep. Zoos should make improvements in terms of enclosure designs, record keeping and information management, upliftment of feed facilities and veterinary infrastructure based on the available protocols. Such changes shall be incorporated as part of Master Plan.

Target: Overall CTA to be completed by 2031 starting 2023

- ▶ *Assessment of the equipment and identification of vacancies with respect to the requirement of animal rescue, followed by the procurement of the equipment and onboarding of personnel by 2023.*
- ▶ *Draft and develop SOPs, standard guidelines for the rescue and upkeep of animals (this may include consultation from species specific experts), this shall be made a part of the zoo Master Plan to ensure standardization – 2024*
- ▶ *Quarterly training of personnel for rescue and rehabilitation.*

Pillar 4 Catalyze science-based conservation action in zoos

Conservation challenges are complex and can benefit from interdisciplinary collaboration for cutting edge scientific and technological innovations, and the leveraging of capacity and resources among partners.

- i. Prioritize areas for research in collaboration with universities, research bodies and other zoological institution.



Research is a core function of a zoological institution and makes it a meaningful site for scientific exploration. In addition, research at the zoo can strengthen management initiatives and welfare concerns, ensuring better care for animals as well offer further insight into the behavioral and psychological trends in animals.

CALL to ACTION: Prepare a long-term research plan and identify relevant basic and applied research for example behavioural research, physiology, animal welfare and disease surveillance activities.

Target: Overall CTA to be completed by 2022

- ▶ Identify research areas basis priority of the zoo and prepare long term research plan by 2022
- ii. Recruit mandated technical and scientific personnel as per RZR, 2009.

For more details please refer to Annexure for Pillar 4, Annexure

Target: Overall CTA to be completed by 2024

Based on annual review of zoo management, all zoos to fill in the vacant positions after identifying the gaps- by 2024

Leading practice: Role of biologists at Arignar Anna Zoological Park

Three biologists deal with matters relating to animal exchange, education, research, interpretation and training, outreach programme, zoo club, record keeping etc. They report directly to the Deputy Director and then to the Director. The primary task of the biologists is to contribute to the scientific management of animals held in the stock of the zoo by keeping a close watch on upkeep, feeding, behaviour and breeding of the animals, meticulously recording and analysing the observations and making suitable suggestions for improving the health and breeding potential of the animals, prevention of diseases and behavioural management.

- iii. Communicate science-based management practices

Dissemination of research is paramount for its critical appraisal, future progression, generating interest in the work and for obtaining further funding. Consequently, all zoos need to reach a wide variety of people, and this may include research collaborators and research network. In addition, this may encompass the wider scientific community, research funders, policy makers and government.

CALL to ACTION: Communicate management practices and research findings as scientific and popular articles.

Target: Overall CTA to be completed by 2022

Collaborate with national and international Journals by 2022.

- iv. Use of zoo management software to promote digital and easy record keeping and updation.

Information management is fast becoming the key to effective action. As wildlife habitat for many threatened and endangered species continues to shrink, a greater responsibility is placed on zoos to function in part as the last refuges for more rather than fewer species.

CALL to ACTION: Employ digital application to streamline specific aspects of animal management such as nutrition, veterinary record keeping, husbandry practices etc.

Target: Overall CTA to be completed by 2031 starting 2021

- i. By 2022, all zoo to have mandatory active license of the ZIMS software.



ii. Roll out trainings for digital technologies starting **2021**

Pillar 5 Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature

Zoo's aspire to bring people closer to nature through visitor education and by creating environments as close as possible to naturalistic surroundings. This inspires individuals to reconsider their role in environmental problems and conservation actions and see themselves as part of the solution.

i. Prepare a conservation education plan

Zoos should draft a conservation education plan which encourages people to appreciate nature and develop the critical thinking they need to understand the complexities of ecological problems.

CALL TO ACTION: Zoos will draft a holistic, long-term conservation education plan identifying target audience and segmenting them into useful groups for understanding their needs and designing responsive programs.

Target: Overall CTA to be completed by 2023

- i. Identification of the target audience by **2021**
- ii. Quarterly workshops (for different age groups) for understanding the requirement and formulate education plan starting **2021 until 2023**
- iii. Draft Conservation Education Plan and integrate as part of Master Plan by **2023**
- iv. Annual review of the education plan starting from **2023**

Leading practice: Smithsonian's National Zoo and Conservation Biology Institute, Smithsonian National Zoo- Education

The education goals of the Zoo are measured and monitored through a series of performance metrics.¹⁴ These are:

1. Number of people reached through formal and informal education programs.
2. Number of educational programs based upon education research theory and evaluated using best practices.
3. Percentage of exhibits with active interpreter programs.
4. Number of educational programs underway in collaboration with other Smithsonian units.

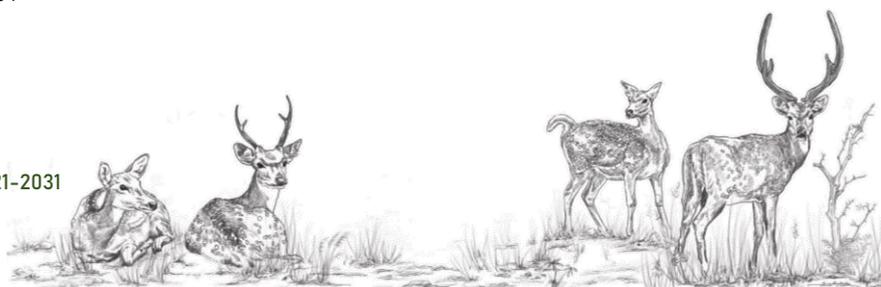
CALL TO ACTION: The plan should be adaptive in nature to account for advances in pedagogical methods.

Target: Overall CTA to be completed by 2023

Draft Conservation Education Plan and integrate as part of Master Plan by 2023

- ii. Engage personnel to conduct education programs

¹⁴ Smithsonian National Zoological Park Strategic Plan 2004



A dedicated educational team is important for curating a curriculum, executing educational programs, preparing promotional materials featuring zoo programs, creating educational materials for presentations, posters, brochures, banners, workbooks, and other handouts etc.

CALL TO ACTION: Establish dedicated educational teams, including at least one full-time education officer, volunteers, experts and interns.

Target: Overall CTA to be completed by 2022

- i. Identify vacant position and draft JDs along with pay per month, by 2021
- ii. Onboarding of personals by 2022
 - a. At least 1 education officer
 - b. Volunteers and interns (invite interns from regional institutes).
- iii. A team comprising of the education officer along with the volunteers and interns shall be made

CALL TO ACTION: Zoos to develop structured volunteer and internship programs aligned with CZA guidelines

Target: Overall CTA to be completed by 2031 starting 2021

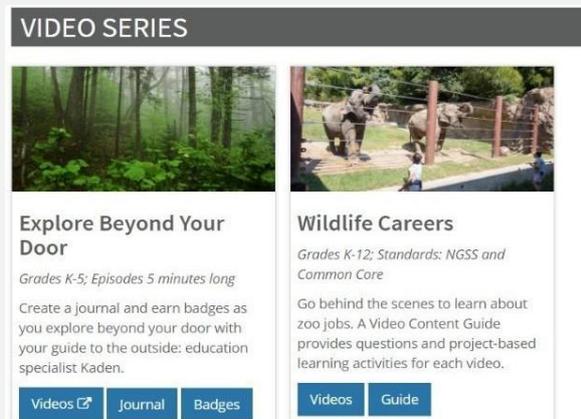
Zoos to organise 6 months internship program (2 sessions- Summer internship/ Winter internship) to begin by 2021.

Leading practice: Smithsonian's National Zoo and Conservation Biology Institute. Smithsonian National Zoo- Education

The educational activities at Smithsonian cover a variety of formats¹⁵. These are:

- At home activities
- Classes
- Camps
- School Programs
- Educator Resources
- Zoo and Wildlife Career FAQs
- Webinars

A snapshot of 'Educational Activities You Can Do at Home':



The screenshot shows a 'VIDEO SERIES' section with two featured videos. The first video is 'Explore Beyond Your Door', which is described as being suitable for Grades K-5 and having 5-minute episodes. It involves creating a journal and earning badges. The second video is 'Wildlife Careers', suitable for Grades K-12 and aligned with NGSS and Common Core standards. It provides a video content guide with questions and project-based learning activities.

- iii. Integrate a comprehensive interpretation strategy

Interpretative learning at the zoo relies heavily on immersive habitat experiences and creating memorable multi-sensory experiences. Although interactive sessions are prohibited in the Indian context, various other interpretative strategies may be applied towards the overall education strategy of the zoo. A comprehensive interpretation strategy includes dedicated interpretation centres, dynamic signages, and exhibit design,

¹⁵ Smithsonian National Zoo- Education



developing IEC material etc. Increasingly, the use of technology as a facilitator of inquiry and a tool for interpretation has gained popularity across the world.

CALL TO ACTION: Zoos will harness digital technologies to reinterpret current educational and interpretive strategies

Target: Overall CTA to be completed by 2025

Functionalizing/ Upgrading Interpretation Center with modern technologies **by 2023** from the empanelled vendor by CZA.

New modern interpretation centres **by 2025** from empanelled vendors by CZA

CALL to ACTION: Organise daily keeper talks for visitor learning

Target: Overall CTA starting immediately and to be completed by 2031

Create a **monthly planner** for organizing keepers talk, species wise (can be linked to any particular species with a particular day) to begin **immediately** in all zoos.

CALL to ACTION: Develop IEC material for dissemination of information.

Information Education and Communication is an important tool to disseminate information to the visitors. The information can be disseminated through variety of medium such as print, short movie, radio jingles etc. The zoo may select over a variety of topics for IEC such as information about any particular species, upcoming important activities in the zoo, universal accessibility and WASH (Water, Sanitation and Hygiene).

Target: Overall CTA to be completed by 2031 starting 2024

- i. Develop IEC Material (at least 1 booklet/brochure and 1 pamphlet in a year, advertisement on local media channel) by engaging vendors empaneled with CZA **by 2024**.
- ii. IEC material be updated **every year**.
- iv. Enhance citizen-science and outreach programs

Citizen science refers to research collaborations between scientists and volunteers that expand opportunities for scientific data collection while also providing access to this information to community. Citizen science programs, usually addressing questions that require long-term, large-scale data collection, are a great way for people to contribute to science.

CALL to ACTION: Outline outreach activities targeting different age-groups which allows for measurable learning outcomes

Education is a central role for all zoos and should thus be part of every zoo's organisational strategy. This includes having a defined educational policy, making a strategic development plan for education, and demonstrating 'green' ethos in the entire running of the facility.

Target: Overall CTA to be completed by 2022

Collaborate with IZE, etc **by 2022**. Membership with IZE

Leading practice: Nawab Wajid Ali Shah Zoological Gardens, Lucknow

“Nawab Wajid Ali Shah Zoological Gardens” gives the highest degree of importance to education, awareness, and outreach targeted at children and youth as they will be the protectors of the future. It has an advance “Nature Interpretation Centre” wherein information related to protected forest areas of Uttar



Pradesh has been provided in this nature learning center and various articles related to wildlife such as skins, horns, embryos etc. have been shown and through signage also extensive information about wildlife, Information is given, The uniqueness of this Nature Interpretation is that it has a gallery of signages which are in the braille format that caters to the visually impaired visitors thus making this zoo Universally accessible, the zoo also conducts regular program, facilitate free entry to Persons with Disability, conduct regular program for school children with special needs.

CALL to ACTION: Adopt citizen science models to actively engage and motivate general public towards wildlife conservation (e.g. documentation of flora and fauna in zoo campus).

Target: Overall CTA to be completed by 2025

Allow and maximize participation of individuals to conduct research in the zoo by 2025

CALL to ACTION: Galvanize partnerships with educational institutions, NGO's, community experts to expand and enhance current educational offerings

Target: Overall CTA to be completed by 2022

Partnerships with educational institutions, NGO's, community expert for promoting conservation education, conservation research, conservation welfare by 2022

CALL to ACTION: Zoos will maximize impact by aligning their educational goals with school curriculums.

Target: Overall CTA to be completed by 2021

Organise guided tours by teachers and children by 2021

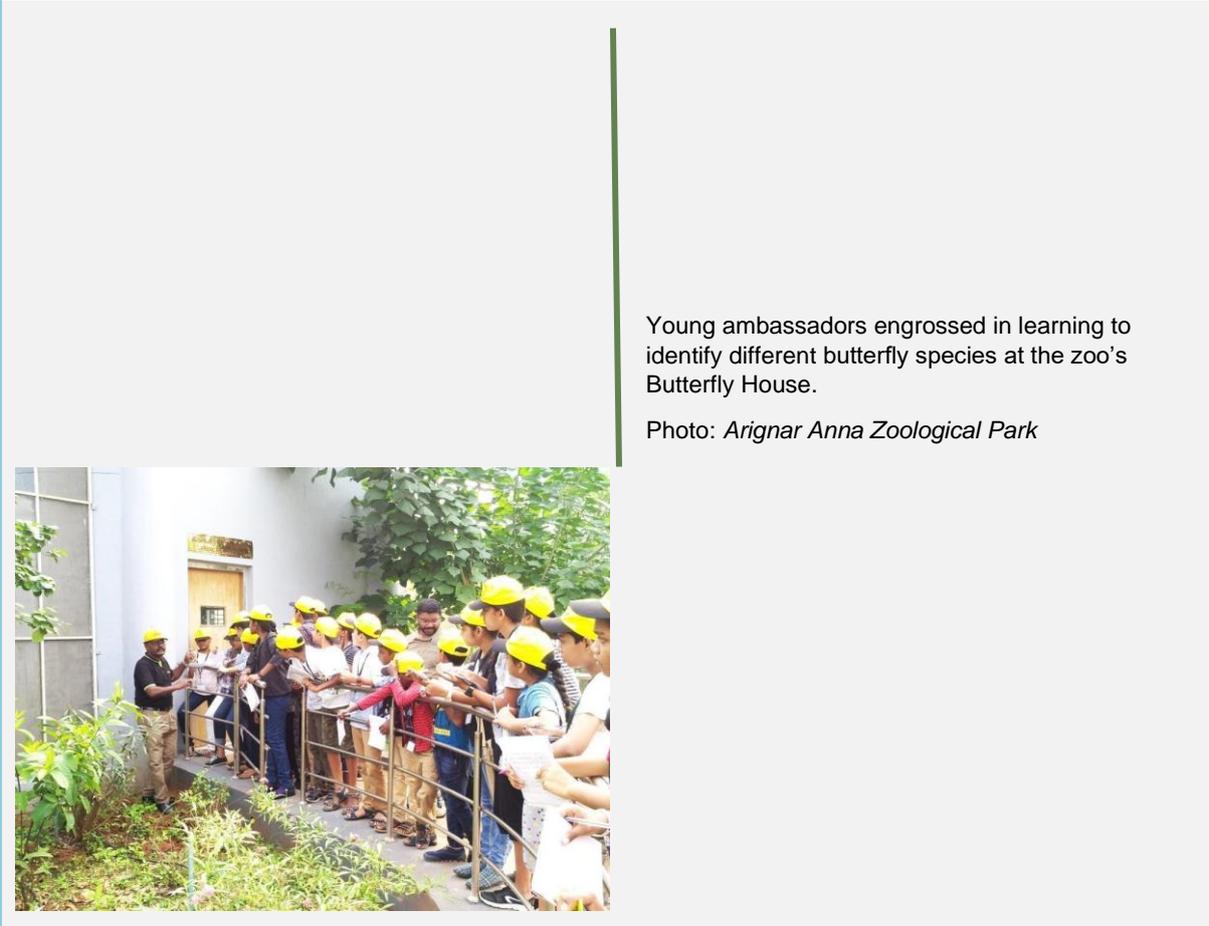
Leading practice: Zoo Ambassadors Camp at Arignar Anna Zoological Park, Chennai

The program is essentially an education-cum-entertainment camp for school age students. It is mentored by Zoo Veterinary Doctor's, Zoo Biologists and special related specialist with the field knowledge. Every day, the students are taken to various animal enclosures inside the zoo and briefed about the sensitization features, identification of animals, role and responsibility of the animals in the ecosystem and adaptive features. At end of the day, students are provided with activity sheets etc. and students are given a certificate for becoming "Zoo Ambassador of Vandalur Zoo" along with a badge and Zoo passport. The Zoo Passport includes 10 free visits to the Zoo Ambassadors for a period of one year. Further, the students get access to Zoo Newsletter, and they can also contribute their work under Zoo Ambassador Corner of Zoo Newsletter. Students act as 'Zoo Ambassadors' and spread the message of conservation to their friends and family members.

In 2020, due to the nationwide lockdown, the camp was moved online. A virtual Zoo Ambassadors camp was planned for May 4-10th 2020, for students from the age of 10 to 20 years. The camp featured interactive sessions in English and Tamil with field experts, which include veterinarians and biologists who work with the zoo, for an hour every day. Live as well as recorded videos of the animals and birds in the zoo were included, and also two sessions dedicated to butterflies, and the zoo's butterfly park. Participants were encouraged to ask questions to the experts and use the opportunity to learn more about the zoo.

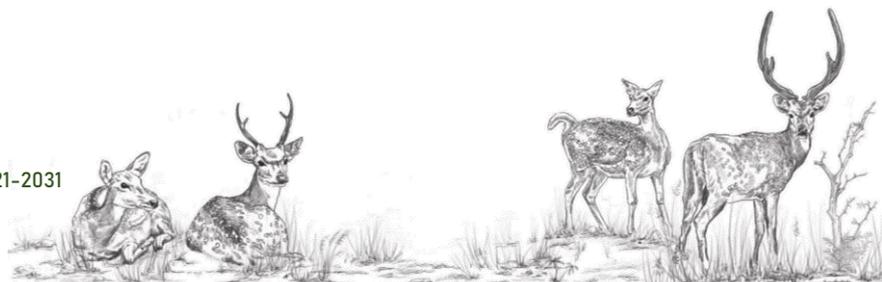
The live streaming feature available on the website also gained further traction during the lockdown—with approximately 60,000-80,000 daily views. 14 different species were available to watch, with the help of 180 cameras installed in the zoo and animal enclosures. An extra special feature was added during the lockdown, showcasing animals undertaking a particular activity, for example: elephants taking a shower





Young ambassadors engrossed in learning to identify different butterfly species at the zoo's Butterfly House.

Photo: *Arignar Anna Zoological Park*



Leading practice: Los Angeles Zoo Volunteer Program (<https://www.lazoo.org/join-our-community/volunteers/>)

The Los Angeles Zoo has a successfully running volunteer program, where people of all ages, income levels, academic backgrounds come together to help at the zoo. In the 2018 alone, over 567 volunteers gave 72,988 service hours of their time. The zoo insists on rigorous training for its volunteers, as outlined below:

Docents:

- Docents support the zoo by leading school tours, member tours, assist in various educational programs as well as serve as zoo ambassadors, both on and off grounds.
- All docents are required to complete a training course that has been accredited by the University of California Los Angeles.
- The 23-week course provides a solid foundation in plant and animal taxonomy, and also tutors enrollees on conservation education.

Student Volunteers:

- Student volunteers engage with the public at certain educational stations,
- Intended for students in tenth grade.
- All student volunteers are required to complete a 13-week training, where they learn about abbreviated taxonomy, conservation, biomes, plant/animal adaptations and more.

All docents and student volunteers are required to make at least a two-year commitment with 100 and 60 hours per year, respectively. They must also pass an annual written test with a minimum score of 90%.

General Volunteers:

- General volunteers help with a number of tasks around the zoo, including helping visitors find their way, meal-preparation for animals and more.
- The required time commitment is 96 hours/year and ages 16+ are welcome to apply.
- Training includes two full days in the classroom and on-grounds.

Research Volunteers:

- Required to take a UCLA accredited extension course, ‘Observing Animals: Behavioural Studies in Zoos’, offered annually by the Zoo’s Director of Research
- The 11-week course trains students in non-intrusive observational techniques and practices

In addition, some specialized positions are offered to seasoned volunteers. The minimum pre-requisite for these roles is completing a 30-hour introductory period. These include participating in enrichment workshops, where volunteers create enrichment devices for animals and occasionally work on exhibit installing devices. Recently, volunteers were celebrated for their service in a special event, where recognition was given to those who reached certain milestones.

Leading practice: GSDP course at Arignar Anna Zoological Park



A certificate course on Bird Identification and Basic Ornithology was conducted by Arignar Anna Zoological Park, Zoo School under the GSDP in coordination with Department of Environment and sponsored by the central Ministry. The course lasted a total of 160 hours from 11th November 2019 to 6th December 2019. This course provides an opportunity for school dropouts and graduates to develop their skills and to enhance their knowledge in bird identification and basic ornithology.

The syllabus includes the introduction of birds, evolution, history, classification, adaptation, habitat, behavior, diversity, threats, conservation, bird watching, identification of birds, documentation, basic of instrumentation in birding, tourism, field visits to wetland and forest areas and so on. Senior Professors, Biologist, Veterinarians and expert birders from various division handled the session

The valedictory programme was conducted at the Zoo school auditorium on 6th December 2019. Tmt K.Geethanjali I.F.S. Additional Director, Department of Environment, Tamil Nadu, Tmt Sudha Ramen I.F.S. Deputy Director, Arignar Anna Zoological Park, Thiru.K.Sekar, Assistant Director, Arignar Anna Zoological Park, presided the programme and distributed the certificates to the participants.

Leading practice: Bringing conservation to the community through citizen science programs

eBird India

Indian birds.

E-BIRD INDIA (CITIZEN SCIENCE PROGRAM): The eBird India portal is designed for the use of birders and eBirders from India and plays an increasingly important role in science and conservation. The portal is managed by **Bird Count India**, a partnership of a large number of organizations and groups working to increase collective understanding of the distribution, abundance, and population trends of



data is publicly accessible online and can explored using an innovative interface developed by the National Geographic Society¹⁶

FrogWatch USA is a citizen science program of the AZA where volunteers are invited to learn about the wetlands in their local communities by documenting the calls of local frogs and toads. Volunteers form the bedrock of the program. Following completion of a 6-hour long training program (includes a classroom component as well as field experience) at chapter organization, volunteers then listen for frog and toads during evenings from February-August and enter their findings in an online database. Chapter organizations include AZA-accredited zoos and aquariums, wildlife and natures centres, and are led by trained experts. The

The Durrell Wildlife Conservation Trust runs the **Toad-watch campaign**, which asks community members to help report where and when they see the Jersey toad (*Bufo bufo*). Locally known as the 'crapaud', the toad is a rare and unique species, found only on the island. In recent years, the population has been declining in natural ponds, largely due to the shift from traditional agricultural reservoirs to mobile stock watering tanks. In addition to reporting toad sightings, volunteers participate in the Toads on Roads campaign. On wet,

¹⁶ <https://www.aza.org/frogwatch?locale=en>





warm winter nights, volunteers pick up toads, weigh and measure them, and carry them across busy roads. The data submitted by Jersey residents helps create an island-wide distribution picture of the crapaud.¹⁷

Pillar 6 Enhance visitor experience through immersive and inclusive design

Visitor experience encompasses a visitor's emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviours and accomplishments that occur before, during, and after human–environment/system interactions. Understanding visitor's engagement and interaction with the zoo environment helps in identifying people's needs, planning and designing of animal exhibits, providing adequate amenities, aid development of business and marketing strategies¹⁸ and build a zoo campus that is climate responsive, reflective of regional ecology, environmentally sustainable and universally accessible

- i. Zoos in India must reflect the regional ecology and must integrate sustainable and universally accessible features.

CALL TO ACTION: Zoos will adopt innovative campus design utilising/focussing on the above mentioned design principles/features

Target: Overall CTA to be completed by 2028

- ▶ Assessment of existing campus design by 2022
- ▶ Implementation/upgradation to be completed by 2028

Leading Practice: Van Vihar National Park, Bhopal India



The new design of Entrance Gate 1 complex at Van Vihar National Park- has been built upon the natural conditions of the site, sustainability principles, and aesthetic appeal through visual branding, while promoting the mission of conserving nature and animal welfare.

The scale and the intent of the design mandate - responding to nature and local context, incorporating sustainable principles, establishing visual branding- unique landmark of the city, prioritizing universal

accessibility principles.

Source: Van Vihar National Park and Zoo, India

¹⁷ <http://wildlife.durrell.org/latest/news/toadwatch-2011-introduces-bufo-the-slug-slayer/>

¹⁸ Visitor behavior in zoos: A review – Davey G.



- ii. Ensure sufficient provisioning and upkeep of visitor amenities- parking areas, food facilities, resting areas, etc.

CALL TO ACTION: Zoos shall include Service Level Agreements (SLA) for customer satisfaction, reduced Turn Around Time (TAT), etc. in all future contract agreements with facility management operators.

Target: Overall CTA to be completed by 2023

Development of SLAs for Turn Around time etc by 2023

- iii. Improve visitor satisfaction through enhancement of connections with the city/region as well as the experiences on offer, while catering to a wide visitor demographic

CALL TO ACTION: Enhance connectivity with the city. Identify zoos in city Master Plans and formulate complimenting building regulations for surrounding areas.

Good physical connectivity between zoo and city is one of the driving forces that motivates visitors to visit zoos and increases visitation. The zoo may be promoted as a tourist and experiential learning destination.

Target: Overall CTA to be completed by 2023

Zoos to consult city development authority to provide a no development buffer zone around zoos by 2023

CALL TO ACTION: Include zoos in local/ regional tourist circuits

Zoos can also improve connectivity through all public modes of transport of the city and integration with city tourist circuits.

Leading Practice: Zoo Zurich, Switzerland¹⁹



The Zoo Zurich is only 5 kms away from the city centre and is well connected via several city transports such as public trams, city buses, pedestrian and cycling routes.

Moreover, Zoo Zurich’s free app “ZüriPlan”, helps visitors to plan their routes prior to their visit. This has gained popularity, among tourists who goes to visit Zoo Zurich.

CALL TO ACTION: Include options of group bookings, monthly/ quarterly/ yearly memberships and run loyalty programmes.

Target: Overall CTA to be completed by 2021

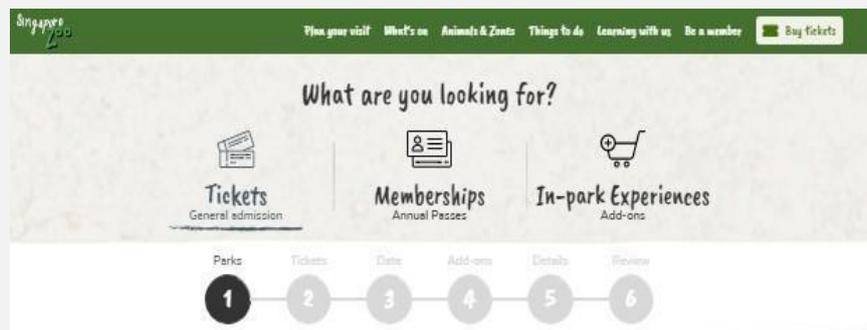
Collaborate with local tourist agency by 2021

¹⁹ Source: <https://www.zoo.ch/en>



Leading Practice: Singapore Zoo

The Singapore Zoo offers various options to visitors to book their visit date, time and tours before visiting the zoo. The zoo has promotional ticket, single park ticket options and multi park visit with reasonable discount prices. Furthermore, the zoo offers Wild card pass through membership (specially to individual and family members) which has discounts to access wildlife tours and wildlife parks of the zoo campus. This flexibility of online booking created an enhanced experience to the visitors.



- iv. Offer unique attractions and experiences that caters to a wide visitor demographic and enhance the zoo experience

The importance of community outreach, especially with a view to integrate a wide visitor demographic is widely accepted. Zoos must analyse their visitor demographic and design unique attractions and immersive experiences accordingly.

Leading Practice: Allwetterzoo Munster, Germany



Responding to Allwetterzoo's motto of "experiencing animals very close up", the white rhinoceros enclosure of the zoo was renovated and expanded. The newly constructed interior and exterior areas of the enclosure provided retreat opportunities for animals and allowed better animal breeding management. The modified design of the enclosure allowed visitors to observe the animals at different levels. Furthermore, the interactive signages near the enclosure, provides a comprehensive picture of the native habitat and behaviors of animals. Visitors (varying from children to elderly), use the interactive signages to play the quiz on rhino habitat, by dropping a coin. This donation is then directed to the rhinoceros conservation projects.

Leading practice: Nawab Wajid Ali Shah Zoological Gardens, Lucknow

"Nawab Wajid Ali Shah Zoological Gardens" gives the highest degree of importance to education, awareness, and outreach targeted at children and youth as they will be the protectors of the future. It has an advance "Nature Interpretation Center" where in Information related to protected forest areas of Uttar Pradesh has been provided in this nature learning center and various articles related to wildlife such as skins, horns, embryos etc. have been shown and through signage also extensive information about wildlife, Information is given, The uniqueness of this Nature Interpretation is that it has a gallery of signages which are in the braille format that caters to the visually impaired visitors thus making this zoo Universally accessible, the zoo also conducts regular program, facilitate free entry to Persons with Disability, conduct regular program for school children with special needs.

CALL TO ACTION: Provide digitally immersive experiences such as 4D shows, VR technologies in interpretation centre, etc.

Target: Overall CTA to be completed by 2023

Upgrading Interpretation Centre with modern interpretive strategies by 2023 from the empanelled vendor by CZA.

Leading Practice: Digital Zoo in Lyckele Zoo, Sweden

Lycksele Zoo started "Digital Djurpark" (Digital Zoo) in 2008. This Digital Djurpark was EU project and a cooperation between the digital media lab at the department of Applied Physics and Electronics (TFE) at Umea University and Lycksele Zoo. Lycksele Zoo is Sweden's most northern zoo and specialized in Nordic fauna with wildlife in Sweden. The idea behind the project was to give zoo-visitors new experiences during their visit and let them be able to interact with the zoo and to give the visitor a chance to get to know the animals in a more personal way before their actual visit. By making it possible for visitors to follow animals from home, the traditional way to visit the zoo would change. Today there are about ten different species that can be seen live at Lycksele Zoo's website.

CALL TO ACTION: Create programmes that cater to diverse interests (E.g. bird watchers, photography lovers) and age groups.

Target: Overall CTA to be completed by 2031

Organise **seasonal** programmes (3 programmes in 1 year)

CALL TO ACTION: Develop experiences for children based on natural play-space principles



Target: Overall CTA to be completed by 2022

Onboarding of experts to develop children based natural play spaces by 2022

Leading Practice: Nature’s Playground at Adelaide Zoo

Natural and wild spaces offer the best opportunities for children to play freely outdoors. Through creative design, the zoo can offer a space for children to explore their imagination, stimulate their senses, as well as teach them about other living things. Recognizing the need for a playground at their Adelaide Zoo campus, Zoos South Australia sought to design an inclusive, sustainable and innovative space based on nature play principles.²⁰

The project was also executed with a dedicated commitment to sustainability. Wherever possible, trees were left untouched and integrated into the design. Others were relocated within the play-space, and many more were planted to provide shade. Many elements of the site were reclaimed and transformed into rocks, logs, seats, sculptures, paving etc. The playground brought new life into the zoo, setting an example of inclusive and educational play-space design for other zoos to emulate.

CALL TO ACTION: Ensure equal admission opportunities for all sections of society through subsidies.

Target: Overall CTA to be completed by 2022

Providing 50% discount on ticket for all age groups at least during 10 holidays/ Sundays starting 2022

- v. Devise programmes and partnerships towards a community driven conservation mission

Building partnerships is an indispensable component to nearly all aspects of zoo functioning. It is especially important for zoo educators, as they try to reach the maximum number of people from diverse backgrounds to promote the conservation mission. Partnerships—with schools, community organizations, regional and local education centres, species experts can offer nuanced and tailored knowledge. Zoos and zoo educators should develop formal working relationships with such groups, and devise programmes that help to achieve conservation mission.

Leading Practice: Dare to Care for Bears Programme²¹

India is home four subspecies of bears. The International Bear Foundation (IBF), Ouwehand Zoo, Netherlands supports education and public awareness of bear problems and solutions, as well as research, conservation, and rescue activities. Zoo Outreach Organization (ZOO) represents IBF in India, producing educational materials, maintaining a data base of bear problems, and circulating management materials for bear-bearing zoos.

The “Dare to Care for Bears” Education Program is an example of a model that ZOO has been refining over many decades. The model is a cost-effective way to reach maximum number of zoo visitors across India, with the help of an entertaining program and a simple packet of activity items and information. ZOO designs a program featuring species or special issues and creates “Kits” to support it. These kits include several items: Guidelines for collaborating zoos, which organize public programs targeted at

²⁰ For more on nature play principles and a set of best practices towards integrating them into playgrounds, see: Playspace-Design-Principles.pdf (natureplaysa.org.au)

²¹ ZOO’S PRINT Aug 2002.



school children, packets for each participant, and more. Prior to any special event or designated ‘eco-day’, zoos and related organizations are invited to apply to ZOO for free program kits, by sending a short proposal. It must include plans for a public function and a commitment to send a detailed report including photographs, press clippings and reimbursement for postage. Many Indian zoos do not have trained educators to create such materials, so this model is very convenient. Through this program, at least 10,000 persons have been educated for about \$2000

CALL TO ACTION: *Partake in festivals/ celebrations that resonate with city/ region’s cultural identity*

Target: *Overall CTA to be completed by 2023*

Identify local agencies for organising festivals

Involve local agencies to organise festivals, setting up of kiosks, shops etc by 2023

- vi. Strengthen branding and marketing of the zoos through merchandise, logos, colours, advertisements etc.

A strong external communication strategy helps promote an organization, increase its recognition as a unique brand and improves its ratings. Zoos should invest in creating unique identities and develop a more comprehensive strategy to achieve it.

CALL TO ACTION: *Formulate a marketing plan for the Zoo*

Target: *Overall CTA to be completed by 2031 starting 2022*

Onboarding of experts to formulate marketing plan- to start by 2022

CALL TO ACTION: *Assign a dedicate internal team and/or Public Relations consultant, to design media campaigns, develop promotional content and manage public communication*

Target: *Overall CTA to be completed by 2031 starting 2023*

Involve dedicated PR consultant for public communication and campaign by 2023

CALL TO ACTION: *Introduce branding and marketing as a budgetary head and earmark funds under the same*

Leading Practice: Building community participation at Chester Zoo, England

Creating mechanisms for greater community participation in zoo governance can be as simple as annual townhall meetings or as innovative as building a digital platform to record individual experiences and suggestions post-visit. As future gatekeepers of the planet, young people have the greatest stake in preserving our biodiversity, yet the weakest voice. The potential payoff from empowering young people to help shape the future direction of the zoo is immense.

The Chester Zoo in Cheshire, England appointed its first Youth Board in 2020. The Youth Board is comprised of 13 members between the ages of 18 and 25. Members have been carefully selected from diverse backgrounds—including a tattoo artist, an engineer, a veterinary student and others. The Youth Board sits directly under the zoo’s board of trustees and will meet regularly throughout the year to shape the zoo’s future direction. Each member is also assigned their own mentor from the senior management team, who will help to cultivate their leadership skills.



Pillar 7 Leverage technology to expand outreach, overall efficiency and improve animal welfare

Given the continuous advancements in technology, digital interpretation is a burgeoning field of possibilities in zoos. The use of digital technology can help zoos to expand outreach programmes, improve animal welfare, and achieve overall efficiency. Interactive technological systems can offer opportunities to enhance visitor experience of animal encounters by widening the temporal and spatial dimensions of the encounter.

- i. Broaden outreach to visitors through digital platforms for pre – visit engagement and post visit experiences

An annual communication plan is an important and effective step in expanding the visitor’s communication initiatives of zoos through various digital mediums such as social media platforms, digital events, official website/ apps, virtual zoo experiences, online presence at different travel sites.

CALL TO ACTION: Assign a dedicate internal team and/or Public Relations Officer, to design media campaigns, develop promotional content and manage public communication.

Target: Overall CTA to be completed by 2022

Onboarding of experts to design media campaigns, develop promotional content and manage public communication by 2022

CALL TO ACTION: Maintain active presence on social media platforms

CALL TO ACTION: Create and maintain website and mobile application

Website is an essential tool in any marketing strategy. Zoos can use it to keep visitors up to date with special offers and news about zoo. It is important that visitors are able to find what they need quickly through clearly laid-out information and straightforward navigation.

Target: Overall CTA to be completed by 2023 (go-live of website and app)

CALL TO ACTION: Update profiles on important/popular public travel sites

Target: Overall CTA to be completed by 2023

All zoo to connect with local state level tour operators and regional chapter of Indian Association of Tour Operators for branding and promotion of their zoo on their platforms.

Leading Practice: Using digital platforms to elicit feedback and suggestions

Some zoos use social media a means of quick, informal and friendly communication with visitors. Platforms like Facebook, Twitter and Instagram lend the benefit of real-time response, and as posts are publicly shared, other users can also read the replies. Customer support through social media is an increasingly popular method, and one that should be applied to Indian zoos as well. Woodland Park Zoo, Seattle uses Twitter to reply to visitors, adopting a tone of voice that is warm, positive as well as informative. Some other best practices include replying in a timely manner, greets users by name and offering a phone number to take conversations offline.



Leading Practice: Fish4Life Campaign at Taronga Zoo, Sydney²²

On its official website, The Taronga Zoo overlooks Sydney Harbour and receives about 1 million annual zoo visitors. Taronga Zoo has been rigorously working towards using the zoo's social media accounts and website as tools for post-visit influence. One such web-based engagement program attempted to influence zoo visitors to make more sustainable seafood purchasing decisions: the Fish4Life campaign.

Taronga Zoo visitors signed up to Fish4Life during seal shows by texting their email address to the zoo. They then received four Fish4Life emails (one per week), which had messages about sustainable seafood and links to the Fish4Life campaign pages on the Taronga Zoo's website.

The website included:

- a message about key issues for several marine species
- a three-minute video delivered by a zookeeper about non-sustainable seafood behaviours and their impact
- links to four fishy facts
- links to sustainable seafood recipes.
- a short quiz based on the content of the keeper video and website.

While the seal exhibit sparked initial interest, the Fish4Life online campaign took the zoo a step closer to translating that interest into tangible behaviour change. with over 2,000 people signing up during shows over a four-week period. Visitors who took part in the Fish4Life online campaign reported:

- a decrease in the consumption of unsustainable seafood
- an increase in the consumption of sustainable seafood
- positive evaluation of the website content.

- ii. Use digital platforms for administrative, financial operations and essential service provisioning (water, electricity etc.) to improve monitoring, Turn-Around Time (TAT) and overall efficiency.

CALL TO ACTION: Use software or digital platforms for management of inventory, vendors, contracts and other administrative operations.

Target: Overall CTA to be completed by 2027 (software go-live to be completed)

Leading Practice: Internal communication at Taronga Zoo

Utilising Mobile Technology: Taronga introduced 'StaX' – an experience mobile app for employees to focus on simplifying processes, enhancing the zoo end user experience and integration with back-end systems for straight forward processing via mobile technology. The trial version of the app was released to Taronga Zoo employees in March 2019 and included features such as safety messaging, digitised annual leave applications, procurement requisitions, employee's directory and emergency code alerts. Feedback from employees has been extremely positive and the app has

²² Encouraging sea life-friendly choices - BehaviourWorks Australia. Accessed 12 January 2021.



been used to lodge over 1300 leave requests and purchase requisitions. It has provided essential information to employees with over 26,000 views in the first two months of operation.

Procurement Made Easy: A procurement intranet site was introduced to Taronga to facilitate all aspects of procurement. The microsite was designed to make the end user procurement journey hassle-free by having very clear sections, good search bar capabilities and the use of simple non-technical language. The procurement microsite is a single place where all policies, procedures, templates and important information can be found.

SAP Project Elevate: Taronga's growth and diversification requires excellent data analysis to support the broad range of commercial, education and conservation activities. Currently access to data and ease of analysis is limited and not available on timely basis. Taronga has a new partnership with its sponsor SAP to uplift core business systems to continuously updated cloud systems for finance, procurement, payroll and human resources. The project will provide current and continuously updated cloud systems for Taronga's new phase of commercial growth, as well as expanded education and conservation programs.

- iii. Expand use of technology for various aspects of animal care and management that promote behavioural diversity, increase control and choice and create a cognitively complex environment of the animals.

CALL TO ACTION: Zoos to use digital software that can help to gather and manage the data rigorously.

Target: Overall CTA to be completed by 2031 starting 2023

- i. All zoos to buy ZIMS license by 2023
- ii. Renewal of the license to be done annually or suggested

CALL TO ACTION: Set aside funds for procurement of new digital technologies and engaging experts for preparation of digital learning resources

Target: Overall CTA to be completed by 2031 starting 2021

- i. Zoos to go 100% digital by 2031
- ii. Zoos to procure new digital technologies and onboard experts to start by 2021

- iv. Use digital technology for improving the quality of education and improve outreach

The use of digital technology can facilitate educational goals in a number of ways, particularly so as zoo visitors are increasingly 'digital natives.'²³ For instance, blurring the lines between education and entertainment, global Edu-tech companies have put together virtual-reality films that help audiences feel as if they are up close and personal with nature.

²³The term 'Digital natives' refers to young people who were born into the digital era and are growing up surrounded by the continuous flow of digital information. "Digital Natives, Digital Immigrants", Mark Prensky, 2001.



Pillar 8 Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare

Zoos need to garner a steady stream of revenue to effectively fund their operations. Gate revenue is the primary source of income for zoos, coupled with support from the government agencies and subsidiary sources such as bank interests, sale of items, leases, rents and penalties.

- i. Develop innovative strategies to increase the primary revenue source

Innovative strategies shall be developed to increase revenue for zoos by focussing on visitors and enhancing visitor experience. Zoos should also focus on marketing and publicity and put a business plan in place that will guide the direction of operations.

CALL TO ACTION: *Improve earnings from souvenir shops, food facilities, audio visual tours, augmented reality shows, establish partnerships with local agencies and markets for selling of products.*

Target: Overall CTA to be completed by 2023

- i. *Identification of innovative strategies for revenue enhancement (expert opinion) to be achieved by 2022*
- ii. *Establishment of partnerships with local agencies for selling, setting up of kiosks, shops etc. starting 2023*

Leading Practice: The Oakfield Restaurant at Chester Zoo

The Oakfield restaurant located at the Chester Zoo, has been ranked in the top 10% of the world's restaurant by users of TripAdvisor and has received 2020 Traveller's Choice Award. The grade II listed historic home of the founder of Chester Zoo- Mr. George Mottershead has been converted into restaurant, following 3million GBP of refurbishment and restoration. Chester Zoo being the UK's most visited zoo, has also attracted many visitors to visit this restaurant. Furthermore, **the revenue generated by The Oakfield also helped to fund several other conservation projects to protect the endangered species from extinction.**



CALL TO ACTION: *Delivering curated and paid learning programs, skill development workshops, etc. (over and above existing programs) for interested participants*

Target: Overall CTA to be completed by 2023



Develop learning material and skill development workshops (experts) by 2023

CALL TO ACTION: Revitalise the 'Adopt an Animal' programme using principles of good branding and marketing.

Target: Overall CTA to be completed by 2023

Revised programme design by 2022 using principles of good branding and marketing- using partnerships, high quality advertising material, etc.

Rolling out programme by 2023

ii. Enable measures for cost optimization

The financial management of Zoos has to be assessed based on their capacity to generate resources and become self-sufficient. Various strategies which include deployment of technology, use of sustainable means, pricing strategies are few of the methods to optimise costs.

CALL TO ACTION: Adopt cost optimization measures such as streamlining supply chain, outsourcing non-core activities, etc.

Target: Overall CTA to be completed by 2027

Identification of key cost optimising measures (such as technology development, redesign of existing work flows etc.) by 2025

Implementation by 2027

Leading practice: In – house captive Slaughterhouse and Fodder Farm

Nandankanan Zoological Park, Bhubaneswar has the following provisions: -

- **Captive slaughterhouse**

The zoo has set up a captive slaughterhouse, first of its kind, inside the park to ensure regular supply of fresh and hygienically processed buffalo meat for the carnivores. The daily requirement of buffalo meat to feed the carnivore population in the park is about 350 Kg.

- **Captive fodder farm:**

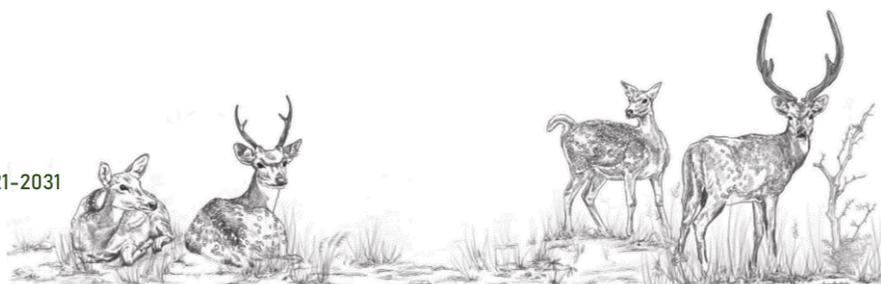
Different types of grasses and fodder are given to the herbivores from the captive fodder farm of the zoo spread over an area of 33 Acres. Seasonal/periodical organic farming of different grass/fodder is carried out in the farm to ensure supply of fresh and essential fodder to the herbivores in the zoo (daily requirement being about 3200 Kg).

Leading Practice: Revenue sources at the San Diego Zoo²⁴

San Diego Zoo Global is a not-for-profit organization, funded through

- Grants,
 - The largest grant in the organization's history came in 2000: \$7.5 million from the Arnold and Mabel Beckman Foundation, which went toward the construction of the

²⁴ <https://smartasset.com/taxes/the-economics-of-zoos>



Arnold and Mabel Beckman Center for Reproduction of Endangered Species (renamed the Arnold and Mabel Beckman Center for Conservation Research after CRES' rebranding) on the Wild Animal Park property.

- The largest individual donation to the organization came in 2004: \$10 million from the estate of Joan Kroc, which was used in part to finance a renovation project at the Zoo which included a new habitat, Joan B. Kroc's Monkey Trails and Forest Tales, named in Kroc's honor.
- Membership revenue, sales of tickets, merchandise,
- Food at the Zoo and Safari Park
- Employer matching,
- Memorial and tribute gifts,
- Exhibition sponsorship,
- Wildlife adoptions,
- Annual Zoo Gala fundraiser, with regular tickets for \$450 and “preferred seating” tickets for \$900
- Revenues from property taxes collected by the City of San Diego, the result of a proposition passed in 1934 that allows the organization to receive \$0.02 from every \$100 collected in property taxes, to be used for maintenance of zoological exhibits at the San Diego Zoo. By 2015 this amounted to approximately \$12 million a year, out of the organization's total annual earnings of almost \$270 million.

In 2013, the organization's total revenues were at 259 million USD and its expenses at 229 million USD resulting in an excess of 30 million USD. Further, 54.3% of the organization's revenues came from contributions, gifts, and grants, 35.3% from membership dues, and the remainder from fundraising events and government grants; while 86.5% of its expenses (over \$199 million) went toward operating its programs, 10.4% to administration, and 3.1% to fundraising.

Leading Practice: Manglore Refinery and Petrochemicals Ltd. donates Rs.3.4 crore to Pilikula Biological Park

MRPL has signed an Memorandum of Understanding (MoU) with the 'Dr. Shivarama Karantha Pilikula Nisarga Dhama Mangaluru' for the adoption of wild animals in Pilikula Biological Park for a period of 12 months. The project is being taken up under the CER (Corporate Environment Responsibility) expenditure of the company, and financial assistance to the tune of ₹4.16 crore shall be spent for this cause. During the Covid-19 outbreak, the lockdown resulted in the loss of revenue to Pilikula Biological Park.

The financial assistance also covers the adoption of more than 1,200 mammals, reptiles and birds of 120 species by the MRPL. MRPL's funds will be mainly used for feeding 1,200 wild animals and also to provide veterinary facilities for them.

- iii. Expand revenue base through Public Private Partnership (PPP) model and Corporate Social Responsibility (CSR) Fund



CALL TO ACTION: Zoos should adopt leading CSR and PPP practices, to expand revenue base.

Target: Overall CTA starting 2021

- ▶ Zoos to identify needs and explore the possibilities for entering into long term PPP agreements
- ▶ Zoos to identify the possibility of funding through CSR based on need -based proposals

Pillar 9 Develop skilled, motivated and empowered teams, for all facets of zoo management

The success of any high performing organization depends on its people. Zoos are complex institutions, requiring a wide range of skills and expertise for optimal functioning, including wildlife management training (preferably captive), administrative experience, communication skills and more.

- i. Foster linkages across educational institutions, government departments, community organizations and international zoos to nurture talent.

Zoos should emphasize the importance of facilitating communication across and within departments, as well as between different organizational levels within and outside the country. The zoo should also foster linkages with media, corporates and policy makers and explore possibilities of key stakeholder partnerships.

Leading Practice: Building a nature precinct within the city, with public sector support

Singapore Zoo officially opened to the public in 1973 on Mandai Lake Road, and soon gained acclaim for its advanced open-enclosure design. In 1994, the world's first Night Zoo, Night Safari, was established within the Mandai area. Both wildlife parks, as well as the Jurong Bird Park, are managed by the Wildlife Reserves Singapore (WRS), a holding company formed in 2000 to manage the institutions collectively. The River Safari, Asia's first river-themed wildlife park was added to the developments at Mandai in 2011 and is also managed by WRS.

In 2015, Mandai Park Holdings (MPH) was established with a view to create a large-scale, nature project in the Mandai precinct, integrating the existing wildlife parks into a wider ecosystem. Mandai Park Holdings (MPH) is the parent company for Wildlife Reserves Singapore (WRS) and Mandai Park Development (MPD). A new board of directors was established under MPH to oversee both Wildlife Reserves Singapore (the company operating the four wildlife parks) and Mandai Park Development (the company tasked with positioning Mandai as a coherent and highly appealing nature and wildlife destination).

Mandai Park Holdings, including WRS, is owned by Temasek Holdings (the majority shareholder) and the Singapore Tourism Board. Incorporated in 1974, Temasek is one of two sovereign wealth funds in Singapore, fully owned by the Ministry of Finance. It has been the majority shareholder in the wildlife parks of WRS since their inception. Although WRS's operational expenses are fully self-sufficient, the institution does also receive partial funding (30%) towards the development of exhibits and facilities from the Singapore Tourism Board.

CALL TO ACTION: Zoo to enter into official arrangements like MoUs with likeminded organizations in India and abroad.

Target: Overall CTA to be completed by 2023



Partnership for enhancement of skill and development of skilled motivated teams by 2023

- ii. Establish promotional opportunities for key zoo personnel

Zoo to place emphasis on collaboration, teamwork and inclusiveness. Zoo to ensure systematic documentation of important knowledge and information to build legacies and recognition of work. The zoo can organize monthly lunches and learning programs to exchange knowledge and information; this can be done inter and intra zoo both to help in cross learning.

CALL TO ACTION: Zoos should develop programs for employee enhancement such a quarterly feedback cycles and training starting by 2022

Target: Overall CTA to be completed by 2027

- iii. Encourage an institutional culture where employees feel valued and rewarded.

For permanent officials, frequent and variety of awards on the basis of performance and innovations should be identified. The zoo should act as a site for skill upgradation through specific initiatives.

CALL TO ACTION: Develop integrated and structured programs for employees

Target: Overall CTA to be completed by 2022

Zoos should regularly run programs such a “employee of the year” to provide encouragement (monetary award) starting 2022

Pillar 10 Prioritize infrastructural upgradation, incorporating environmental sustainability measures

Zoos must aim become a part of the global community that understands and embodies the principles of sustainable functioning. The functions of the institution must aim to synergise the elements of soil, water, energy and waste and make this demonstrable.

- i. Devise a comprehensive environmental sustainability strategy including but not limited to:
 - a. Sustainable water management: Involves a sequence of combined actions and not isolated strategies. Emphasis should be laid on the importance of water reuse, filtration and recycling, thoughtful consumption and reduction of water pollution and increase in recharge to the ground-water system.

Leading practice- Innovative sustainable measures for water management

Green roofs

The Detroit Zoo has incorporated innovative sustainable infrastructure in the form of green roofs. A green roof provides a rainwater buffer, purifies the air, reduces the ambient temperature, regulates the indoor temperature, saves energy and as well as provides habitat for wildlife.²⁵

Maintaining water levels of common regional reservoirs

Cheyenne Mountain Zoo is the first ‘water neutral’ zoo in the world. Cheyenne Mountain Zoo is supporting Trout Unlimited’ s program to partner with water users of the region and incentivize them to re-time portions of their water for delivery during the winter months when possible.

²⁵ <https://detroitzoo.org/about/greenprint-sustainability/water-management/>



Restoring stream flows below working reservoirs during the winter months, while simultaneously satisfying water-user needs, creates a better balance of water delivery for the environment, and the people who rely on it.²⁶

Master Plan for water resource management

Lowry Park Zoo, Tampa has formulated master plan for management of its water resources. The plan includes assessment of existing water management systems in terms of capacity and sustainability and proposes measures to meet the future demands.²⁷

Porous pavements and bioretention gardens

Beardsley Zoo, USA, has implemented a project to intercept storm water run – off from 1 acre of existing parking area. Storm water runoff is infiltrated by installation of porous pavements and bioretention gardens that divert 37.85 lakh liter of water from flowing into combined sewer. The estimate is based on removing runoff from impervious surface by capturing 80% of the annual rainfall.²⁸

- b. Renewable energy forms and use products that are carbon neutral, where possible:

Zoos to explore renewable energy forms and to use carbon neutral products by devising a strategic plan which will aim to continuously decrease the environmental impact of its operations.

Leading practice: Innovative sustainable measures for power generation

Carbon neutral certifications

The Wellington Zoo has been certified as carbon neutral zoo that tracks, manages and reduces its greenhouse gas emissions by implementing sustainability measures. The zoo undertakes numerous initiatives to reduce power and waste such as LED lights, recycling of waste, solar power generation, etc. Remaining emissions that the zoo cannot avoid are offset through native forest regeneration programmes.²⁹

Shift towards solar energy by means of partnerships and agreements

The Copenhagen Zoo has entered into a tripartite agreement with solar panel wholesaler, energy consultant and public funding agency to achieve an annual energy savings of 20%. The agreement has yielded installation of solar PV system on roof of 12 buildings and redesigning of common areas such as entrances, etc.³⁰

- c. Innovative methods for disposal and treatment of all types of waste- both organic and in-organic utilizing concepts of circular economy.

²⁶ <https://coloradotu.org/blog/2020/2/cheyenne-mountain-zoo-becomes-water-neutral-with-tu-partnership>

²⁷ <http://www.planhillsborough.org/wp-content/uploads/2017/03/LPZ-Water-Resources-Master-Plan-FINAL.pdf>

²⁸ <https://circa.uconn.edu/wp-content/uploads/sites/1618/2018/12/Beardsley-Zoo-Final-Report.pdf>

²⁹ <https://wellingtonzoo.com/news/carbonzero-re-certification/#:~:text=We're%20tickled%20green%20to,carboNZero%20certified%20in%20May%202013.>

³⁰ <https://www.pveurope.eu/installation/copenhagen-zoo-protects-its-species-power-sun>



Leading practice- Leaders in composting

Columbus Zoo and Aquarium has innovative composting program that sends 8,64,000 kgs of material to local composter. The zoo has partnered with nearby facility to solve the animal waste problem and creating nutrient rich soil and local jobs in the process.³¹

Leading practice- Innovative sustainable measures in plastic management

Water bottle filling stations

Point Defiance Zoo and Aquarium along with many others have installed water filling stations across the zoo that discourage the visitors to buy bottled water. The zoo has also stopped using plastic bags, straws and cutlery at zoo souvenir shops and restaurant.³²

Recycling drop at the zoo

Niabi Zoo offers plastic recycling service to its visitors. The visitors can carry recyclable plastic items to zoo and drop off in the parking lot. The zoo has installed single stream/ mixed recycling container wherein the materials can be recycled without sorting.³³

Plastic free eco - challenge

Challenge was organized between AZA members wherein teams and individuals participated to showcase their contribution towards replace and reuse of plastic. Some of the winning initiatives included 'Zero waste DIY lunch', 'installations and exhibits made out of plastic waste', etc.³⁴

Collaboration with local NGO

To raise awareness against growing usage of plastic bottles, Zoo Society of London collaborated with 9 NGOs for campaign called 'One Less'. The campaign resulted in growing movement with numerous organizations and businesses joining and contributing. Resultantly, number of enterprises were inspired to scrap off usage of plastic bottles from their establishments and replaced them with refillable bottles, cups or water in a box.³⁵

CALL TO ACTION: Each zoo may formulate a long-term environment strategy to guide implementation of sustainability measures.

Target: Overall CTA to be completed by 2025

- i. Appoint experts/ consultant by 2022 to develop the toolkit
- ii. Development of toolkit/guideline to encourage sustainability by 2025

³¹ <https://solusgrp.com/blog/post/zoos-aquariums-and-eco-friendly-waste-management-programs.html#:~:text=By%20collecting%20food%20scraps%20in,it%20to%20the%20composting%20facility.>

³² <https://www.pdza.org/care/plastic-free/>

³³ <https://www.niabizoo.com/conservation/plastic-reduction-initiative/>

³⁴ <https://www.aza.org/from-the-desk-of-dan-ashe/posts/aza-members-participate-in-plastic-free-initiative?locale=en>

³⁵ <https://biaza.org.uk/projects/detail/oneless>



ii. Reduce carbon-footprint of zoos by 10% by 2025

All Zoo should take important steps to audit and minimize their carbon footprint, including innovative waste management systems, energy conservation measures, and updated buildings. The zoo should give emphasis on Carbon efficient projects that may include maintenance of trees and green spaces in zoo and surrounds, switch to renewable energy for energy efficiency, and bio-gas projects.

CALL TO ACTION: All Large and Medium Zoos to commit to sustainability targets by 2031

Target: Overall CTA to be completed by 2022

i. Establish MoU with national, international and global organizations by 2022

ii. Organize quarterly workshops with partners starting 2022

iii. Embed sustainability into all aspects of zoo management, adopting international standards and innovative strategies.

Leading practice- Environmental strategy at Bristol Zoo

The Bristol Zoo has developed an Environmental Policy to guide its ongoing improvements in sustainability performance. The same has also formed the basis of Bristol Zoo’s Environmental Management System (EMS). An Environmental Management System (EMS) is a systematic and coordinated framework used by an organization to deliver integrated environmental activities, as set out in its environmental policy. Bristol Zoo received ISO 14001 accreditation for the same in March 2008.

The concept of Ordered Retreat provides a logical process for organizations to reduce their ecological and carbon footprints, ultimately achieving at least zero net impact in all elements of environmental sustainability.

There are four steps to the process as showcased in the illustration below:



The Application of 'Ordered Retreat' to all the Elements of Environmental Sustainability					
Element		Measure, Audit, Analyse	Stop, Avoid, Reduce	Sustainable & renewable alternatives	Offset
Carbon	1	<ul style="list-style-type: none"> Carbon calculators.: <ul style="list-style-type: none"> SALOME Carbon Trust Carbon accounting software 	<ul style="list-style-type: none"> Do everything in columns 2-7B 	<ul style="list-style-type: none"> Do everything in columns 2-7B 	<ul style="list-style-type: none"> Credible Carbon Offset scheme, <ul style="list-style-type: none"> World Land Trust Woodland Trust PURE Trust The Converging World
Energy	2	<ul style="list-style-type: none"> Sub-metering Bill auditing 	<ul style="list-style-type: none"> Insulate Switch off Natural ventilation 'Green Energy' 	<ul style="list-style-type: none"> Wind turbines Ground/Air source heat pump Solar thermal Combined heat and power Biofuels Photovoltaics 	<ul style="list-style-type: none"> Credible Carbon Offset scheme, <ul style="list-style-type: none"> World Land Trust Woodland Trust PURE Trust The Converging World
Water	3	<ul style="list-style-type: none"> Sub-metering Bill auditing 	<ul style="list-style-type: none"> Waterless urinals Compost toilets Spray taps Water butts 	<ul style="list-style-type: none"> Sustainable supply Borehole Rainwater harvesting Use grey water 	<ul style="list-style-type: none"> Provide clean water for commu the developing world
Transport & Travel	4	<ul style="list-style-type: none"> Visitor surveys Staff surveys 	<ul style="list-style-type: none"> Travel less 	<ul style="list-style-type: none"> Bicycle Walk Public transport Low emission vehicles Video & web conferencing 	<ul style="list-style-type: none"> Develop a Green Travel Plan for & visitors
Organic Waste	5A	<ul style="list-style-type: none"> Audit all exported waste 	<ul style="list-style-type: none"> Minimise waste Low-flush toilets Compost toilets 	<ul style="list-style-type: none"> In-vessel composting Anaerobic digestion Reed bed water treatment 	<ul style="list-style-type: none"> Avoid landfill Provide sustainable technology developing world Credible Carbon Offset scheme, <ul style="list-style-type: none"> World Land Trust Woodland Trust PURE Trust The Converging World
Inorganic Waste	5B	<ul style="list-style-type: none"> Audit all exported waste 	<ul style="list-style-type: none"> Less packaging Responsible hazardous waste disposal. 	<ul style="list-style-type: none"> Recycle plastic, glass, paper, cardboard. Re-use containers Use biodegradable alternatives 	<ul style="list-style-type: none"> Avoid landfill Provide sustainable water treat developing world Credible Carbon Offset scheme, <ul style="list-style-type: none"> World Land Trust Woodland Trust PURE Trust The Converging World

CALL TO ACTION: All zoos will prescribe weightage to sustainability practices within procurement tenders Partner with local, national and global organizations to upgrade existing infrastructure along sustainable lines

Target: Overall CTA to be completed by 2023

Expert consultation to get inputs on sustainable practices by 2023





5 CZA VISION 2021- 2031

Above: Hand rearing of new-borns at Indira Gandhi Zoological Park veterinary hospital. Picture Credit: Indira Gandhi Zoological Park

5. CZA Vision Plan 2021-2031

“Lead the transformation of Indian Zoos, blending science with cutting-edge research and technology to function at par with global animal care, welfare and conservation standards”.

Pillar 1 Strengthening ex situ conservation of endangered native species guided by National Zoo Policy and adoption of the One Plan approach.

The evidence of multifarious pressures and threats leading to increasing extinction rates, exacerbated by climate change; challenges the contemporary dependence on just the in-situ strategies for species and habitat conservation and necessitates increased development of ex situ approaches. For strengthening ex situ conservation, CZA is playing an important role in managing species recovery programs for several endangered species.

- i. Review the species currently selected for planned conservation breeding by CZA using the five-step decision process

A systematised review of the program assessing trends and key demographics with genetic co-relates will aid in the assessment of the program functions and decisions on the way forward. This planned approach will help explore the conservation plan(s) in the following manner – their role, design, feasibility and risk; and allow for a comprehensive decision-making process when finalising ex situ programmes for conservation.

CALL TO ACTION: *Status review and threat analysis of the species through literature review and consultative meetings with species experts.*

The literature review and consultative meetings with species experts will help in assisting in identifying the existing population in their respective categories for their management. The categorisation of endangered species based on the assessment, may be as follows:

1. Assurance populations,
2. Populations that become ambassadors for the species through outreach program,
3. Population for education.

Target: Overall CTA starting 2022 and to be achieved by 2031

- ▶ *Create a workplan with meeting charter, species experts (ex-situ and in-situ) for identified species, for weekly consultative meetings with stakeholders including CZA, species experts (national and international), zoos, international zoo associations (EAZA, AZA etc.) and studbook keepers to be completed by 2022*
- ▶ *Species wise analysis to be compiled in the form of deliverable(s) and annual review starting 2023-2031 with all relevant experts.*

- ii. Identify other endangered native species that warrant ex situ conservation measures using the five-step decision process.

This will help to categorize the new identified species as follows:

- assurance populations,
- populations identified as founders,



- population for education of species.

The categorization of the species will eventually help to bridge gaps and focus on enabling informed decisions for their management.

CALL TO ACTION: Feasibility assessment for establishing an ex situ program for the identified species broadly addressing, but not limited to the following targets:

- a) Status of the species in captivity;
- b) Know-how of husbandry of the species or related species;
- c) Literature review of adaptive potential of the species to sustainably breed in captivity;
- d) Potential of the ex situ program to assist in species restoration in the wild.

Target: Overall CTA to be achieved by 2022

- ▶ Proposal for new/revised ex situ program(s) to be finalized by 2022 along with relevant approvals and budget demand

- iii. Based on the analysis and the feasibility (initiative ii), a revised list of endangered native species for planned conservation breeding programs to be taken up by CZA.

A revised comprehensive list of endangered species shall be made. Conservation programs for each such species shall be initiated in line with best practices available.

CALL TO ACTION: Integrated Conservation Plan derived basis the analysis and feasibility assessment with strong in situ linkages for the identified species. This shall include collaboration and integrations with international breeding programs (Global species management plans, EAZA Ex situ programs etc.)

Target: Overall CTA starting 2023 and to be achieved by 2031

- ▶ Draft Integrated Conservation Plan to be prepared by 2023 with Stakeholder consultation for review/comments, by 2023 and subsequent approval and rollout.

- iv. Ensure financial assistance for taking up planned conservation breeding programs of endangered species.

Critical financial support shall be garnered for conservation, research, and education. Support can be for field conservation activities, management / captive breeding, animal health, animal welfare, conservation education and research.

CALL TO ACTION: Central Zoo Authority shall attempt to secure financial assistance from the Central Government to support ex situ conservation of endangered native species on an annual basis.

Target: Overall CTA to be achieved by 2023

- ▶ 100% funding for conservation breeding programs of endangered species, especially for coordinating zoos. Same may be attempted for participating zoos along with quarterly meeting shall be held for the review and analysis- starting 2023

Pillar 2 Maximize animal welfare at par with global standards

Animal welfare is accorded the highest priority under every legislation for zoos across the country. An animal may be considered in a positive welfare state if it is healthy, comfortable, well nourished, safe, able to express natural behaviour, not suffering from unpleasant states such as pain, fear and distress.

- i. To develop protocols to assess and improve animals' welfare in zoos



borrowing from global standards

Animal welfare assessment is a critical component of animal care in modern zoos. Assessment approaches have several facets and employ indices based on physical conditions and behaviours that are generally aligned with the negative or positive experiences.

CALL TO ACTION: Review and update existing animal care guidelines to include aspects pertaining to nutrition, housing, reproductive, veterinary etc

Target: Overall CTA starting 2022 to be achieved by 2023

- ▶ *Involve experts to develop and review guideline by 2022*
- ▶ *Draft animal care guidelines by 2023*

- ii. To ensure that housing conditions of all animals in recognized zoos are as per standards prescribed by the CZA

CZA has defined design considerations for animal enclosures and related facilities in terms of:

- Appropriate plan regarding health and upkeep of animals
- Appropriate sizing, to provide for animal's physical, social and psychological well – being
- Appropriate climatic conditions
- Maintenance of cleanliness and hygiene standards

Meticulous scrutiny of the documents related to design and housing would align objectives of proposing enclosure designs at part with global standards,

CALL TO ACTION: Dynamic communication with zoos based on review and inclusion of aspects mentioned in reports submitted to CZA

Target: Overall CTA starting 2023 to be achieved by 2031

Annual review of housing condition and other related animal welfare infrastructure – starting from 2023 until 2031 (this shall include onboarding of experts)

For details of the checklist enclosure design please refer to Annexure for Pillar 2 of CZA vision

- iii. Continued commitment to review and expand the scope of animal care guidelines

Ensuring good animal health is one of the major indicators for a positive animal welfare. In order to align animal welfare goals of Indian zoos with that of their global counterparts, the existing guidelines, can incorporate methods and frameworks for assessment of animal welfare in line with global policies and strategies.

CALL TO ACTION: Develop taxa-wise protocols (checklists etc.) to complement existing evaluation modality and MEE for regular welfare assessment.

Animal welfare monitoring or assessment is a critical component of modern animal care. Internal monitoring programmes should employ, and record indices based on physical conditions and behaviours. The data will inform practices that can enhance positive animal welfare.

Target: Overall CTA starting 2021 to be achieved by 2031

- ▶ *Include additional indicators as per the taxa-wise protocols by 2021*
- ▶ *Update checklist to assess animal welfare practice by 2022*



- ▶ *Utilise the comprehensive checklist to annually review the animal welfare practice starting from 2022*

Pillar 3 Advance management of rescued animals through updation of policy and guidelines

With the increase in animal human interactions the role of centres catering to housing and care for animals in conflict either for short or long term and their importance cannot be ignored. The animals in long term care, though not a part of the wilderness form an important part of a conservation paradigm. Management of the rescued animals and the facilities thus is of primary importance.

- i. Policy on the management and placement of rescued animals accepted by zoos for short-term or long-term housing.

CALL TO ACTION: *Expand the scope of the existing policies to specifically address aspects pertaining to acceptance of rescued animals by zoos, housing, aspects of habituation, movement between zoos, and their husbandry to facilitate their release in the wild.*

Target: Overall CTA achieved by 2024

- ▶ *Constitute a committee with experts to develop this framework by 2022*
- ▶ *Develop a long-term policy framework specifically focused on the management and placement of rescued animals with experts by 2024*
- ▶ *Thereafter, annual review to be undertaken.*

CALL TO ACTION: *Review of existing statutory provisions, literature review on husbandry requirements of rescued animals and develop a framework for safe, ethical and efficient handling of animals during rescue operations.*

Target: Overall CTA to be achieved by 2022

- ▶ *Review with help of committee of experts to develop this framework by 2022.*

- ii. Notify guidelines on the husbandry requirements of rescued animals

CALL TO ACTION: *Based on extant guidelines, literature review and expert consultations, derive species/taxa-specific guidelines for short-term and long-term housing of rescued specimens (with special emphasis on species involved in frequent human-animal conflict).*

Target: Overall CTA to be achieved by 2023

- ▶ *Appoint experts or involve agency to develop and review guideline by 2022*
- ▶ *Draft species/taxa-specific guidelines for short-term and long-term housing of rescued specimens by 2023*

CALL TO ACTION: *Develop criteria to assess level of habituation in rescued animals (under short-term or long-term care) prior to release in the wild (e.g. an index for the degree of habituation).*

Target: Overall CTA starting 2022 to be achieved by 2024

- ▶ *Form a committee of experts/scientists and veterinarians to study best practices adopted for short- and long-term housing by 2022.*
- ▶ *Develop criteria to assess the level of habituation in rescued*



animals (this may include consultation with expert) by 2023

- ▶ *By 2023 a comprehensive checklist to be prepared and to be used for the assessment*
- ▶ *Notification of guideline on the husbandry requirements of rescued animals and checklist to be circulated to zoo by 2024*

iii. Prepare guidelines for the efficient release of rescued animals accepted by zoos in the wild.

There is a need for a concentrated effort to rehabilitate and release animals from short term care into the wild. Every effort must be made to use innovation and ideas to prepare generic documents that are contextually acceptable and that help make “back to the wild” stories more commonplace.

CALL TO ACTION: *Based on principles of the reintroduction biology, extant guidelines and expert consultations, develop Standard Operating Procedures (SOPs) (targeted at taxa level) for the release of animals in the wild.*

Target: Overall CTA starting 2021 to be achieved by 2023

- ▶ *SOP (taxa level) formulation for the release of animals in wild - to finish (this may include onboarding of experts) by 2023*

Leading practice: WTI’s Rescue Team Reunites Leopard Cub with its Mother.

Working with the Assam Forest Department and with help from the local community, Wildlife Trust of India’s Mobile Veterinary Service in Eastern Assam reunited a leopard cub with its mother within 12 hours of finding it in a tea estate. A leopard cub found stuck in a small trench in one of the tea gardens at Natun Gaon, Tinsukia. Workers at the tea garden had spotted the leopard and her cub sometime in the early hours of May 23, 2021, the team comprising, the Veterinarian the biologist along with forest department staff reached the spot, the veterinarian took charge and the vitals were monitored.

The cub was a melanistic female, barely a month old. The vet administered oral rehydration to the dehydrated cub and the decision to reunite the cub was taken immediately in consultation with the forest department.

Leading practice: THE CENTRE FOR BEAR REHABILITATION AND CONSERVATION (CBRC)

Established under the Pakke Conservation Project, it is first specialized rehabilitation centre for Asiatic black bears in India. Supported by the Ministry of Environment and Forests (MoEF), the center was established jointly by the Arunachal Pradesh Forest Department, International Fund for Animal Welfare (IFAW) and Wildlife Trust of India (WTI) in 2002, with an aim to rehabilitate displaced cubs back into the wild.

CBRC provides shelter, food and veterinary care to orphaned cubs, with the aim of eventual wild rehabilitation



Pillar 4 Catalyze science-based conservation action in zoos

Zoos function as open learning spaces that can inspire development of novel research projects that bridge multidisciplinary faculties., giving added value to the animals within and build connect with those protecting the species in the wild.

- i. Zoos function as centers for both basic and applied research by promoting collaborations with academic and scientific institutions.

CALL TO ACTION: Zoos have access to current literature related to zoo science. An online repository of materials related to ex-situ conservation research shall be developed to this end, which shall also include research reports from CZA-funded projects.

Target: Overall CTA to be achieved by 2021

- ▶ Creation of an online portal/tab on the CZA website for a repository of materials related to ex-situ conservation research and successful projects funded by CZA by 2021. The online portal to be updated monthly by 1 designated person in charge of maintenance of the online repository

Leading Practice: Zoo Literature in ZSL Library, London

ZSL Library is one of the major zoological libraries in the world. It contains a wide range of books and journals on all types of animals and their conservation. The Library also holds a special collection of material relating specifically to zoos and aquariums of the world. The books also relate to a wide range of literature published about various aspects of zoos and aquariums including design, animal management, history and biographies of zoo employees.

Husbandry Manuals: These contain details of best practice for the husbandry of various zoo animals and are very valuable to keepers, particularly if a new species is arriving at the zoo. They are also very useful for animal management students.

Books: Books are published on a wide range of subjects relating to zoos and aquariums including history, design, ethics, the role of zoos in conservation and education in zoos.

This creates a platform accessible to all for any zoo/animal related information.

CALL TO ACTION: Promote formal collaborations with local/national/international universities, organizations and research institutions.

Target: Overall CTA to be achieved by 2022

- ▶ Identification of the possible collaboration and signing of the Agreements with them for research and capacity building starting 2022

- ii. Promote science-based management in zoos by initiating systematically funded research projects

CALL TO ACTION: Strengthen small grants research program by actively promoting zoos to take up relevant short-term/long-term research to improve zoo management.

Target: Overall CTA to be achieved by 2022

- ▶ Revision for the small grants program (eligibility, application process, fund) by 2022.



CALL TO ACTION Enforce recruitment of mandated technical and scientific personnel by zoos. CZA shall also aim to regularly revise these guidelines.

Target: Overall CTA starting 2021 and to be achieved by 2022

- ▶ CZA will revise the guidelines for the scientific management of zoos and ensure compliance of the recruitment of scientific and technical staff through annual review- starting 2021.
- ▶ CZA shall also fund the zoos (need basis) for the recruitment of scientific and technical staff at the zoos starting 2022

- iii. Lead the establishment of a Centre Of Excellence (COE) in ex situ conservation to support and advance policy decisions and management.

Conservation breeding is a flagship activity of the Central Zoo Authority to promote conservation of threatened Indian wildlife. CZA shall set up a COE in ex- situ conservation; this will bring together people from different competencies and will provide a shared facility of resources. This will become a world-class zoological learning facility to support and advance policy decisions.

CALL TO ACTION: Feasibility study, concept building and consultation meetings with experts for COE establishment

Target: Overall CTA starting 2024 and to be achieved by 2031

- ▶ Creation of workplan (concept based) and feasibility study for the development of a centre for excellence (expert consultation meeting will be required) – 2024, For this onboarding of experts to run the centre shall be done by 2025 (continuing activity)
- ▶ Construction of the Centre for excellence by 2028 (CZA)
- ▶ Procurement of research equipment (such as table, chair, computers etc) yearly - post construction starting 2029

- iv. Lead the establishment of a National Wildlife Disease Referral Centre to support and advance surveillance, healthcare, veterinary interventions and research.

The objective this centre shall be to provide basic and strategic research for improvement of animal health for enhanced productivity and the development in veterinary and animal science to promote livestock, health and production.

CALL TO ACTION: Feasibility study, concept building and consultation meetings with experts for National Wildlife Disease Referral Centre establishment.

Target: Overall CTA starting 2024 and to be achieved by 2031

- ▶ Creation of workplan (concept based) and feasibility study for the development of a National Wildlife Diseases Referral Centre (expert consultation meeting will be required) – 2024, For this onboarding of experts to run the centre shall be done by 2025 (continuing activity)
- ▶ Construction of the National Wildlife Diseases Referral Centre by 2028 (CZA)
- ▶ Procurement of research equipment and other equipment (such as table, chair, computers etc) yearly - post construction starting 2029



Pillar 5 Steer zoos to function as learning institutions by (having a) long-term conservation education plan as part of the Master Plan

Conservation education is a multi-layered discipline- that embraces elements of environmental education, science education, interpretation, education for sustainable development, science communication and community engagement. To guide zoos to engage in critical thinking about conservation education initiatives, a long-term conservation education plan can drive zoos to deliver better outcomes for conservation.

- i. Set standards and best practice guidelines for education using a coordinated approach. This standardised document may include, but not limited to the following-
 1. Setting out strategies that can encourage zoos to write their mission statement that should reflect the conservation education role of the zoo.
 2. Outlining the overarching commitments and philosophy of conservation education, that can enable zoos to deliver and evaluate quality conservation education.
 3. Guiding zoos to include appropriate and upgrade existing facilities in order to develop a quality conservation education.
 4. Creating mandate for zoos, to include conservation education as an integral element while designing and planning zoos.
 5. Demonstrating the need and benefit of partnerships between national, international zoos association, conservation organisations and communities to develop a quality holistic conservation education plan.
 6. Recommending zoos to coordinate with national -international conservation education and learning experts that can influence zoos to deliver quality education on conservation.

CALL TO ACTION: Consultation with educators and experiential learning experts to create a document that will outline standards and best practices that Indian Zoos can implement in terms of education strategies and programs.

Target: Overall CTA starting 2022 and to be achieved by 2031

- ▶ Monthly consultative meetings with stakeholders including CZA, education experts (national and international), zoos, international zoo associations (EAZA, AZA etc.) – to begin **by 2022**.
- ▶ Conduct workshops- **starting 2022**
- ▶ Draft the standardised document on Conservation Education Plan **by 2023**.
- ▶ Annual review and upgradation of plan, **starting 2023-2031** with all relevant experts.

Leading Practice: The Ocean Literacy Framework



The Ocean Literacy Framework sets out principles that were developed in collective consultation from over 100 teachers, scientists and education policymakers around the globe.

- Each principle stipulates “flow” of related concepts that become gradually more complex.
- The principles offer an excellent framework for formal and informal learning programmes and enable clear learning outcomes to be developed and evaluated.

Ocean literacy is now a global movement with networks in Asia, Europe, North and South America, Canada, and Australia.

Furthermore, there is a clear role for zoos and aquariums in providing access to authentic and compelling ocean experiences and learning programmes that can strengthen the learner’s connection with the ocean. Proceeding papers, posters and theses or dissertations. The publications can be searched using keywords, name of author, type of publication, institution name, or date.

Pillar 6 Establish an experienced team of ex-situ conservation management personnel.

Human resource is the core of any organisation. Having a motivated experienced and capable team can help a strong engagement with all aspects of organisation functioning; from case to policy issues, to scientific inquiry, publication, communication etc,

- Invest in people to attract and retain talented and accomplished staff at all levels

The success of any high performing organization depends on its people. CZA may work towards improving its existing staff strength and onboarding relevant experts to enhance its existing team.

CALL TO ACTION: Upgrade existing staffing standards to include core competencies, responsibilities and suggested growth trajectories

Target: Overall CTA to be achieved by 2021

- ▶ *Analysis of the existing standards for core competencies, responsibilities. (to be done through experts) – 2021*

CALL TO ACTION: Member Secretary shall be upgraded to at least APCCF or equivalent with the Pay Matrix Level 16

Please refer to Annexure 2 for Pillar 6 under CZA vision

Target: Overall CTA to be achieved by 2022

- ▶ *Draft new standards to include new and permanent positions, revised competencies and responsibilities. (this shall include revisions in the pay scale) – experts’ opinion for drafting the revised staffing standards (expenditure covered above) by 2022*
- ▶ *Office space to be provided for the new positions created (procurement of computer/table/chair etc) by 2022*

- Encourage an institutional culture where employees feel valued and rewarded

Employees who feel valued have increased motivation in the workplace, greater commitment, and show greater levels of innovation.

This can be achieved by



incorporating inputs on a regular basis, encourage collaboration and team effort, rewarding results and facilitating growth and opportunity amongst others.

CALL TO ACTION: Provide staff with regular training and adequate infrastructure within CZA office premises for development opportunities, supporting performance and growth.

Target: Overall CTA to be achieved by 2021

- ▶ Quarterly workshops shall be conducted for employee trainings (3rd party experts) and quarterly feedback cycles on employee performance for enhanced growth, starting 2021

Leading practice: Improving employee satisfaction at WRS Singapore ³⁶

Building a collaborative culture: WRS Singapore prioritizes a strong community of people sharing the same commitment to wildlife. Thus, the institution places emphasis of notions of collaboration, teamwork and inclusiveness. Sharing a common purpose and passion brings people together to work successfully. In providing staff meals, teams dine in a family-oriented way. Major festivals (usually riding on the town halls) are celebrated together, so the feeling of togetherness is evident across the parks.

This philosophy is anchored by the senior leadership, who also play an active role through leading by example. , for example, every Sunday, one member of the senior management team is on duty in one of the parks, as well as on Friday nights at the Night Safari. In this way, they gain a first-hand understanding of the work being put in by employees, as well as gain insight into challenges faces. WRS Singapore has also instituted an annual Management Action Day, where the management team was assigned to help out on the front line.

Aligning values to performance appraisal: WRS Singapore has also embedded parameters from their recently revised values and mission statement. This allows the institution to measure the values that are being exhibited and the areas in which they need to improve. All such actions help integrate the values into all aspects of zoo functioning. Through biannual employee engagement surveys, the institution is to measure the impact of linking the organizational philosophy to appraisals (the results thus far have been encouraging). In addition, among several conservation projects conduct, it is found that staff volunteer themselves to help out, indicative of interest and active participation.

Benefits of being a world-class leading zoological institution: As WRS Singapore is one of the leading zoos worldwide, employees feel proud of their association with the zoo. Attrition rates are high, and people say they want to stay in the organization.

Pillar 7 Infrastructural upgradation, incorporating environmental sustainability measures

The sustainability movement is not limited to just use of green energy and large scale water harvesting recycling etc. Small measures including those in the confines of workspaces may go a long way in reducing the carbon footprint of the community,

- Devise a comprehensive sustainability strategy and practice guidelines for CZA, including but not

³⁶ Q&A: Marcus Heng, CHRO, Wildlife Reserves Singapore (WRS) (humanresourcesonline.net). Accessed 08 January 2021.



limited to:

- a. including the importance of resource reuse and thoughtful consumption
- b. Renewable energy forms and use products that are carbon neutral, where possible
- c. Innovative methods for disposal and treatment of all types of waste

CZA will draft suggestions for the sustainable functioning at their office. These guidelines will help develop comprehensive sustainability strategy that can help offset the negative impacts caused on environment. These policies will also promote and provide framework for initiatives such as “No plastic policy” etc, and enhanced use of technology.

CALL TO ACTION: *Adopt sustainable practices within CZA premises and overall CZA functioning*

Target: *Overall CTA starting 2021 and to be achieved by 2023*

- ▶ *Conduct a sustainability audit for CZA starting 2021, repeated annually*
- ▶ *Adoption of practice manual 2022 (experts)*
- ▶ *Procurement of equipment to promote sustainability by 2023 (ongoing activity)*

Pillar 8 Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare

CZA may standardize the financial reporting method at par with other government departments. This may include implementation of advanced and efficient methodology to order to manage the financial reporting. CZA will explore possibility of receiving project-based grants under various schemes and under the permissible law as enforced by the Ministry of Finance, Gol.

- i. Standardize financial reporting across the country

CALL TO ACTION: *Institutionalize mechanisms such as iMIS for standardized financial reporting of zoos*

Target: *Overall CTA starting 2021 and to be achieved by 2022*

- ▶ *CZA to complete development (one time) of iMIS software by 2021 and push for enforcement in all zoos by 2022. iMIS application to be maintained/upgraded yearly basis.*
- ii. Develop innovative strategies to optimize and increase revenue sources, including but not limited to tapping of relevant government schemes, introduction and optimization of renewal fee/registration fee of zoos etc.

CZA will explore possibility of receiving international funds/grants from, etc. under the permissible law as enforced by the Ministry of Finance, Gol. Further, to maintain global standards CZA will consider revising its current fee.

CZA can also have a centralized account in the form of a KOSH, to receive grants from corporates donors.

CALL TO ACTION: *Convergence with Government departments and secure funds*

Target: *Overall CTA starting 2021 and to be achieved by 2023*

- ▶ *Convergence with government departments and their existing schemes - to start by 2021. These convergences may include- Ministry of Social Justice and*



Empowerment-, Ministry of Tourism etc.

- iii. Leverage CSR and PPP constructs to expand revenue base

CALL TO ACTION: Guide zoos towards exploring CSR and PPP

Target: Overall CTA starting 2021 and to be achieved by 2023

- ▶ *CZA to devise a centralised CSR and PPP guideline for zoos to engage in mutually beneficial partnerships with policy makers, corporate leaders, public figures, private entities.*

Pillar 9 Support zoos in enhancing visitor experience through immersive and inclusive design

Visitor experience is influenced by a range of factors. In order to facilitate a positive experience, many modern zoos around the world, have incorporated strategies of naturalistic walkthrough, interpretive education, landscape immersed exhibits, reflecting abstract ecology etc as the part of the part of their design philosophy. CZA aims to focus attention on the development of immersive and inclusive design strategies that can truly create the quintessence of a nature immersive experience during a zoo visit.

- i. Work towards enabling naturalistic zoo campuses that are climate responsive, reflective of regional ecology, environmentally sustainable and universally accessible

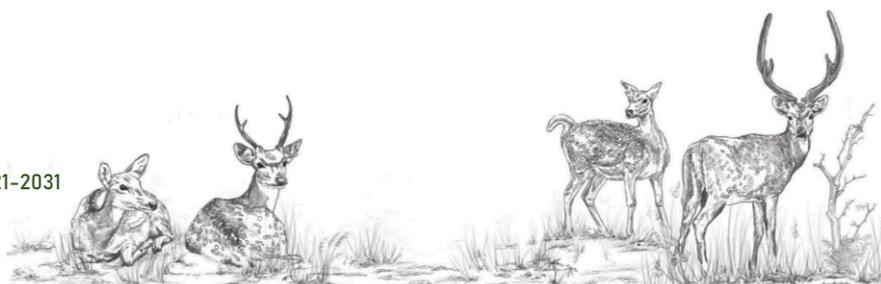
The global standards and policies draw conceptual principles to be considered for zoo design with regard to animal welfare, health and upkeep while others stipulate more tangible clauses in terms of minimum dimensions, usage, hygiene, visibility, naturalistic environment, provisioning of environment enrichments, visitors experience enhancements etc.

CALL TO ACTION: Enhance focus on the following aspects:

- *Empanelment of design consultants*
- *Regular modification and upgradation of zoo design standards- Setting out a modified and upgraded guideline, that can guide zoos to include naturalistic design approach as the part of design and planning of zoo campus enabling immersive experience to the visitors.*
- *Development of zoo design curricula as part of architecture pedagogy and formal partnerships for adoption of curriculum*
- *Promote modern zoo design elements as part of CZA review of enclosure drawings*
- *Build collaborations with international individuals and organizations with expertise in zoo design to enable zoo to access state-of-the-art enclosure designs*
- *Involvement of species experts as part of design review*

Target: Overall CTA starting 2021 and to be achieved by 2031

- ▶ *Prepare RFP document for the empanelment of design consultants by 2021 and empanel design consultants by 2021. Run empanelment process every 3 years.*
- ▶ *Involve design to develop the revised zoo design guideline by 2024. Revised Zoo design guideline to be drafted by the expert by 2025*
- ▶ *Formal collaboration and development of zoo design curricula with architecture/design institutions by 2021*
- ▶ *Annual design review session to begin with immediate effect and to*



continue till 2031. At least, 2 design experts and 1 species specific expert to be included as part of the design review.

- ▶ *Establishing an MOU with global zoo design experts to get inputs on advanced enclosure designs by 2022*
- ▶ *Quarterly workshops with international zoo design experts are required- start by 2022.*

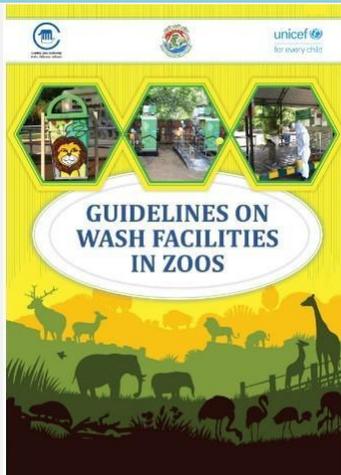
CALL TO ACTION: CZA will upgrade the standards for provisioning of basic amenities in zoos

Apart from setting out the modified zoo design standards, CZA to upgrade and incorporate standards for provisioning basic amenities such as sufficient toilets, benches, comfortable walking paths with sitting area, accessible ramps for enclosure, cloak rooms at the entrance gate etc.

Target: Overall CTA starting 2022 and to be achieved by 2023

- ▶ *Involvement of WASH experts to develop the standardised guideline by 2022.*
- ▶ *Drafting standardised document that stipulates the provision of basic amenities and WASH facilities in zoo by 2023.*

Leading practice: Guidelines on WASH facilities in Zoos, 2021



CZA in collaboration with UNICEF- India, has developed Guidelines on WASH facilities in Zoos 2021, a document that provides guidance to Indian zoos for creating and maintaining WASH facilities within the zoo premises for the zoo staff and visitors.

The document further provides a framework for designing and maintaining facilities for drinking water, public toilets, handwash stations and solid and liquid waste management systems in Indian zoos. This will further help the zoos to plan, implement, operate and maintain the existing and newly created WASH facilities within their premises.

Pillar 10 Leverage technology to expand outreach, impact and overall efficiency of Indian Zoos

- i. Use digital technology for improving the quality of education and reach more than 1 billion persons per year

Technological innovations will enhance the education of zoo visitors by influencing their attitudes, knowledge, and behaviour as well as improving their conservation efforts. It will allow visitors to experience the animals more directly and will increase visitor interest in the species as well as in its conservation. Virtual reality can allow visitors to come closer to nature without harming any of the animals, this will help in learning techniques and technologies for observational data collection and gain field experience.



CALL TO ACTION: CZA will provide technical support, advice and funding where possible on innovative approaches to digital learning resources for zoos.

Target: Overall CTA starting 2022 and to be achieved by 2023

- ▶ Development of toolkit/guideline to encourage technology enablement at the zoos – **2023**
- ▶ CZA to provide funding for tech- enablement at the zoos **by 2022.**





Annexures

Above: Red Panda at Padmaja Naidu Zoological Park. Picture Credit: Padmaja Naidu Zoological Park

Above: Red Panda at Padmaja Naidu Zoological Park. Picture Credit: Padmaja Naidu Zoological Park

6. Annexure A: Timelines for achievement of pillar

Zoo Pillars	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1. Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.											
2. Optimize animal welfare to achieve parity with concurrent global policies											
3. Management of rescued animals											
4. Catalyse science-based conservation action in zoos											
5. Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature											
6. Enhance visitor experience through immersive and inclusive design											
7. Leverage technology to expand outreach, overall efficiency and improve animal welfare											
8. Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare											
9. Develop skilled, motivated and empowered teams, for all facets of zoo management											
10. Prioritize infrastructural upgradation, incorporating environmental sustainability measures											





CZA Pillars	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1. Strengthening ex situ conservation of endangered native species guided by National Zoo Policy and adoption of the IUCN One Plan approach.											
2. Maximise animal welfare at par with global standards											
3. Advance management of rescued animals through updation of policy and guidelines											
4. Catalyze science-based conservation action in zoos											
5. Steer zoos to function as learning institutions by (having a) long-term conservation education plan as part of the Master Plan											
6. Establish an experienced team of ex-situ conservation management personnel.											
7. Infrastructural upgradation, incorporating environmental sustainability measures											
8. Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare											
9. Support zoos in enhancing visitor experience through immersive and inclusive design											
10. Leverage technology to expand outreach, impact and overall efficiency of Indian Zoos											

6. Annexure B:



7. Summary of financial outlay for next 10 years

Total financial outlay for CZA and zoos is INR 6364 crores across 10 years or INR 636 crores per year

- Average zoo outlay is INR 37 crores across 10 years or INR 3.7 crores per year
- CZA outlay is INR 361 crores across 10 years or INR 36 crores per year on average

Important: The financial outlay is over and above current spending that zoos and CZA are already incurring and hence, restricted to additional activities (specified in this Vision Plan) that both CZA and zoos will undertake in the future to work towards global standards. Further, the numbers are approximated using assumptions and past data and are only indicative in nature. They are inclusive of contingency funds and 4% inflation across 10 years.

The pillar wise break up across zoos and CZA is given below:

Zoo Vision	Average Annual Budget estimate (in lakhs) of 160 zoos	Grand Total (outlay for 10 years) (in lakhs) of 160 zoos
1. Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	2,644.80	26,448.00
2. Optimize animal welfare to achieve parity with concurrent global policies	6,636.62	66,366.24
3. Management of rescued animals	8,003.71	80,037.12
4. Catalyze science-based conservation action in zoos	1,562.44	15,624.38
5. Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	12,883.64	1,28,836.42
6. Enhance visitor experience through immersive and inclusive design	5,632.51	56,325.12
7. Leverage technology to expand outreach, overall efficiency and improve animal welfare	18,633.98	1,86,339.84





8. Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	700.42	7,004.16
9. Develop skilled, motivated and empowered teams, for all facets of zoo management	1,504.80	15,048.00
10. Prioritize infrastructural upgradation, incorporating environmental sustainability measures	1,824.00	18,240.00
Total	60026.9	600269.3

CZA Vision	Average Annual Budget estimate (in lakhs)	Grand Total (outlay for 10 years) (in lakhs)
1. Strengthening ex situ conservation of endangered native species guided by National Zoo Policy and adoption of the IUCN One Plan approach.	1,215.24	12,152.40
2. Maximise animal welfare at par with global standards	65.66	656.64
3. Advance management of rescued animals through updation of policy and guidelines	109.44	1,094.40
4. Catalyze science-based conservation action in zoos	1,378.94	13,789.44
5. Steer zoos to function as learning institutions by (having a) long-term conservation education plan as part of the Master Plan	20.25	202.46
6. Establish an experienced team of ex-situ conservation management personnel.	61.10	611.04
7. Infrastructural upgradation, incorporating environmental sustainability measures	122.21	1,222.08





8. Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	57.51	575.13
9. Support zoos in enhancing visitor experience through immersive and inclusive design	126.60	1,265.97
10. Leverage technology to expand outreach, impact and overall efficiency of Indian Zoos	459.28	4,592.83
Total	3,616.24	36162.396



8. Annexure C: Zoo Vision

Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Own the national-level Integrated conservation breeding plan aimed at conservation of native endangered species.	Take the lead for creating successful linkages with in-situ conservation using the One-Plan approach	<p>Overall CTA starting 2021 and to be achieved by 2031</p> <ul style="list-style-type: none"> i. Annual review of all ongoing conservation breeding programs at all zoos. This may include Creation of a workplan (for assessment) with meeting charter, species experts (ex-situ and in-situ) and tentative dates for identified species- by 2021 ii. Species/ program wise assessment to be compiled in a form of deliverable to be submitted to CZA (expert consultation will be required) - annual submission starting 2022 iii. Proposal for new/revised ex situ program(s) to be finalized by 2022. This will include activities such as infrastructure upgradation, onboarding experts etc 	201280
	Raise awareness amongst the general public through specific educational programmes, trainings, workshops as well as signages on endangered and priority species.	<p>Overall CTA starting 2023 and to be achieved by 2031</p> <ul style="list-style-type: none"> i. Zoos to update their Conservation Education Plan and integrate them as a part of Master Plan by 2023, for this they should have 	1,920



		<p><i>consultative meetings with experts</i></p> <p><i>ii. Conduct half yearly workshops for dissemination of zoo education to public of different age groups (starting immediately).</i></p>	
2. Take up conservation breeding as per assigned role(s) by CZA	Collaborate with international breeding programs such as EEP & SSP.	<p>Overall CTA to be achieved by 2024</p> <p><i>Identify the possible international collaborations, along with approvals from government bodies for signing of MOU by 2024. The funds for the same may be secured through government programs and international programs.</i></p>	Covered under Pillar 5
	Secure funding (in addition to CZA grant) and necessary infrastructure for the running the program from the State Govt. and other sources		
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			26448



Pillar 2 Optimize animal welfare to achieve parity with concurrent global policies

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Create infrastructure for animal housing based on CZA prescribed standards that account for species-specific biological requirements.	Employ novel approaches to enclosure designing (encompassing outdoor areas, holding areas, temporary separation areas like kraals etc.)	Overall CTA to be completed by 2022 <i>Engage design experts/ firm from the CZA empaneled professional list by 2022 to assess and conceptualize the new/revised design for enclosures.</i>	1,152
	Include biological requirements like dens, hides, resting ledges etc. into the design elements of the enclosure and holding areas.	Overall CTA to be completed by 2025 <i>Upgradation/ implementation of new/ revised enclosure design by 2025</i>	40,000
	Introduce remote monitoring using CCTV for reduced disturbance.	Overall CTA to be completed by 2029 <i>Zoos to install CCTV in every animal enclosure by 2029</i>	2,624



2. Adopt husbandry practices as per CZA prescribed standards and any other concurrent global husbandry practices	<p>Adopt a modern approach to interventions including those related to husbandry and veterinary sciences to reduce stress inclusive of:</p> <ul style="list-style-type: none"> - to allow expression of the full range of species-specific behavioural repertoire and reduce instances of boredom and stereotypies (e.g. parent rearing, courtship displays etc.). - provision an appropriate diet that meets holistic nutritional needs of the species. - positive enforcement of behaviours that facilitate medical examinations and tests, shifting, etc 	<p>Overall CTA to be completed by 2025</p> <ul style="list-style-type: none"> i. Engage experts/ firm from the CZA empaneled professional list by 2022 to assess and finalize the improvement. ii. Implementation of finalized improvements by 2025 	1,536
	<p>Use observational and/or minimally invasive procedures (e.g. through analysis of fecal samples) to assess stress levels in zoo animals.</p>	<p>Overall CTA starting 2022 and to be completed by 2031 Complete analysis in a form a deliverable to submitted to CZA annually starting 2022</p>	1,280
3. Develop a rigorous record keeping regimes for all individuals housed in the zoos	<p>Achieve 100% marking (permanent) of all the individuals housed in the zoo</p>	<p>Overall CTA to be completed by 2025</p> <p>All zoos are required to shift towards electronic marking system by 2025</p>	880
	<p>Ensure maintenance and updating of Animal History Cards for all individuals</p>	<p>Target: Overall CTA starting 2028 and to be completed by 2031</p> <ul style="list-style-type: none"> i. Shifting towards digital animal history cards, by 2021, so that the data derived from the card can be directly linked with Information Management System by 2028 	24



		<p><i>ii. Involvement of consultants by 2022 to develop digital animal history cards that can be directly linked with information management system by 2028</i></p>	
4. Create a calendar of enrichment activities and interventions.	Species-specific enrichment and seasonal interventions for animals	<p>Overall CTA starting 2022 and to be completed by 2025</p> <p><i>i. Engage experts/ firm from the CZA empaneled professional list by 2022 to assess and finalize the improvement</i></p> <p><i>ii. Implementation of finalized improvements by 2025</i></p>	1,280
	Create and periodically update a collection bank of enrichment material comprising of eco-friendly material to enable dynamic enrichment within enclosure spaces	<p>Overall CTA starting 2022 and to be completed by 2025</p> <p><i>i. Experts engaged above can help in identifying natural material that can be used multiple/ dynamic enrichment by 2022</i></p> <p><i>ii. Identification of storage space and related SOP by 2023</i></p> <p><i>iii. Stockpile to be created by 2025</i></p>	640



<p>5. Collaborate with global zoological community to advance animal care practices.</p>	<p>Establishing an MOU with global zoological community to advance animal care practices.</p>	<p>Overall CTA starting 2021 and to be completed by 2031</p> <p><i>i. Identify global zoological community for possible collaboration by 2021</i></p> <p><i>ii. Organising workshops with the experts from global zoological community - to begin by 2022 -4 workshops in a year is required</i></p>	<p>6,400</p>
<p>6. Build capacity of animal keepers to sensitize them of routine practices and for cases needing specialized care and rigorous monitoring (keeper regimes to manage breeding animals etc.)</p>	<p>Developing a specialized training framework for animal keepers to deliver optimal animal care</p>	<p>Overall CTA starting 2022 and to be completed by 2031</p> <p><i>Annual trainings to be rolled out by 2022</i></p>	<p>2,400</p>
<p>7. Integrating technology in animal welfare</p>	<p>Covered in detail under Pillar 7</p>		
<p>Total (including 10% Contingency Fund+ 4% inflation for 10 years)</p>			<p>66,366.24</p>



Pillar 3 Management of rescued animals

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Zoos should develop necessary infrastructure to function as rescue centres.	Establish necessary off display infrastructure for quarantine, short-term/long-term care of species commonly rescued from the respective region (e.g. species-specific housing).	<p>Overall CTA to be completed by 2025</p> <p>i. Assessment of the rescue facilities by each zoo with the help of experts by 2022.</p> <p>ii. Upgradation/ revision of existing infrastructure by 2023</p> <p>iii. Implementation of new infrastructure by 2025</p>	800 1728 6400
	Ensure implementation of standardised protocols for efficient management of animals upon acceptance in the zoo.	<p>Overall CTA to be completed by 2023</p> <p>SOP adoption by 2023</p>	480
	Explore possibility of funding from respective State and Central Government Schemes (e.g. CAMPA) for establishment and operation of rescue centre.	<p>Overall CTA starting 2025 and to be completed by 2031</p> <p>i. Assessment of the rescue facilities by each zoo with the help of experts by 2022.</p> <p>ii. Secure funding for upgradation of existing infrastructure by 2023</p>	NA
2. Rehabilitation and release of rescued animals	Ensure that management reduces the degree of habituation to facilitate their subsequent rehabilitation.	<p>CTA to be completed by 2023</p> <p>Assessment of infrastructure in the zoos for the release of animals (this may include onboarding of experts) by 2022</p>	Covered above
	Create necessary infrastructure to enable pre-release training.	<p>Overall CTA starting 2023 and to be completed by 2031</p> <p>i. Draft a plan for design and development of such facilities by 2023 (onboarding of design and animal welfare experts empaneled with CZA).</p>	Covered above



		<ul style="list-style-type: none"> ii. <i>Construction of such facilities by 2025 (empaneled vendor of CZA)</i> iii. <i>Annual review of rescue related infrastructure – starting from 2025 until 2031 (this shall include onboarding of experts)</i> 	
3. Availability of equipment and trained personnel to assist local animal rescue operations	As part of long-term Master Plan, prepare an SOP (including equipment, personnel responsible, operation protocols) to effectively assist in rescue operations, when needed.	<p>Overall CTA starting 2023 and to be completed by 2031</p> <ul style="list-style-type: none"> i. <i>Assessment of the equipment and identification of vacancies with respect to the requirement of animal rescue, followed by the procurement of the equipment and onboarding of personnel by 2023.</i> ii. <i>Draft and develop SOPs, standard guidelines for the rescue and upkeep of animals (this may include consultation from species specific experts), this shall be made a part of the zoo master plan to ensure standardisation – 2024</i> iii. Quarterly <i>training of personnel for rescue and rehabilitation- at immediate effect</i> 	<p>2880</p> <p>57600</p> <p>NA</p> <p>320</p>
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			80037.12



Pillar 4: Catalyze science-based conservation action in zoos

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Prioritize areas for research in collaboration with universities, research bodies and other zoological institution.	Prepare a long-term research plan and identify relevant basic and applied research for example behavioural research, physiology, animal welfare and disease surveillance activities.	Overall CTA to be completed by 2022 <i>Identify research areas basis priority of the zoo and prepare long term research plan by 2022</i>	3840
2. Recruit mandated technical and scientific personnel as per RZR, 2009.		Overall CTA to be completed by 2024 <i>Based on annual review of zoo management, all zoo to fill in the vacant positions after identifying the gaps- by 2024</i>	2400
3. Communicate science-based management practices	Communicate management practices and research findings as scientific and popular articles.	Overall CTA to be completed by 2022 <i>Collaborate with national and international Journals by 2022.</i>	3200
4. Use of zoo management software to promote digital and easy record keeping and updation.	Employ digital application to streamline specific aspects of animal management such as nutrition, veterinary record keeping, husbandry practices etc.	Overall CTA starting 2021 and to be completed by 2031 <i>i. By 2022 all zoo to have mandatory active license of the ZIMS software.</i> <i>ii. Roll out trainings for digital technologies starting 2021</i>	1065.6 3,200
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			15624.384



Details of Pillar 4, Initiative 2 Vacant positions and call for recruitment in all zoos:

Category of Staff	Large zoo	Medium zoo	Small zoo	Mini zoo
Curator	1	1	1	Mini Zoos may involve / depute experts from other govt departments or avail the assistance of appropriately qualified individuals available locally.
Veterinarian	2	1	1	
Education Officer	1	1	1	
Biologist	1	1		

In cases the scientific and technical posts are filled by direct recruitment, the recruitment rule for such posts shall provide for their career progression including the benefit of flexible complementing scheme for their promotions



Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Prepare a conservation education plan	Zoos will draft holistic, long-term education plans identifying target audiences and segmenting them into useful groups for understanding their needs and designing responsive programs.	<p>Overall CTA to be completed by 2023</p> <p><i>i. Identification of the target audience by 2021</i></p> <p><i>ii. Quarterly workshops (for different age groups) for understanding the requirement and formulate education plan starting 2021 until 2023</i></p> <p><i>iii. Draft Conservation Education Plan and integrate as part of Master Plan by 2023</i></p> <p><i>iv. Annual review of the education plan starting from 2023</i></p>	<p>1,280</p> <p>15,360</p> <p>3,840</p>
	The plan should be adaptive in nature to account for advances in pedagogical methods.	<p>Overall CTA to be completed by 2023</p> <p><i>Draft Conservation Education Plan and integrate as part of Master Plan by 2023</i></p>	Covered above



<p>2. Engage personnel to conduct education programs</p>	<p>Establish dedicated educational teams, including at least one full-time education officer, volunteers, experts and interns.</p>	<p>Overall CTA to be completed by 2022</p> <ul style="list-style-type: none"> <i>i. Identify vacant position and draft job descriptions (JDs) along with pay per month, by 2021</i> <i>ii. Onboarding of personals by 2022</i> <ul style="list-style-type: none"> <i>a. At least 1 education officer</i> <i>b. Volunteers and interns (invite interns from regional institutes).</i> <i>iii. A team comprising of the education officer along with the volunteers and interns shall be made</i> 	<p>2,400</p>
	<p>Zoos to develop structured volunteer and internship programs aligned with CZA guidelines</p>	<p>Overall CTA starting 2021 and to be completed by 2031</p> <p><i>Zoos to organise 6 months internship program (2 sessions- Summer internship/ Winter internship) to begin by 2021.</i></p>	<p>480</p>



3. Integrate a comprehensive interpretation strategy	Zoos will harness digital technologies to reinterpret current educational and interpretive strategies	<p>Overall CTA to be completed by 2025</p> <p>i. <i>Functionalizing/ Upgrading Interpretation Center with modern technologies by 2023 from the empaneled vendor by CZA.</i></p> <p>ii. <i>New modern interpretation centres by 2025 from empaneled vendors by CZA</i></p>	56,320
	Organise daily keeper talks for visitor learning	<p>Overall CTA starting immediately and to be completed by 2031</p> <p><i>Create a monthly planner for organizing keepers talk, species wise (can be linked to any particular species with a particular day) to begin immediately in all zoos.</i></p>	54.4
	Develop IEC material for dissemination of information.	<p>Overall CTA starting 2024 and to be completed by 2031</p> <p>i. <i>Develop IEC Material (atleast 1 booklet/brochure and 1 pamphlet in a year, advertisement on local media channel) by engaging vendor empaneled with CZA by 2024.</i></p> <p>ii. <i>IEC material be updated in every year.</i></p>	1600



4. Enhance citizen-science and outreach programs	Outline outreach activities targeting different age-groups which allows for measurable learning outcomes	Overall CTA to be complete by 2022 <i>Collaborate with IZE, etc by 2022. Membership with IZE</i>	1,600
	Adopt citizen science models to actively engage and motivate general public towards wildlife conservation (e.g. documentation of flora and fauna in zoo campus).	Overall CTA to be complete by 2025 <i>Allow and maximize participation of individuals to conduct research in the zoo by 2025</i>	Covered under Pillar 4
	Galvanize partnerships with educational institutions, NGO's, community experts to expand and enhance current educational offerings	Overall CTA to be completed by 2022 <i>Partnerships with educational institutions, NGO's, community expert for promoting conservation education, conservation research, conservation welfare by 2022</i>	3200
	Zoos will maximize impact by aligning their educational goals with school curriculums.	Overall CTA to be completed by 2021 <i>Organize guided tours by teachers and children by 2021</i>	Covered above
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			1,28,836.416



Pillar 6: Enhance visitor experience through immersive and inclusive design

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Zoos in India must reflect the regional ecology and must integrate sustainable and universally accessible features.	Zoos will adopt innovative campus design utilizing/focusing on the above-mentioned design principles/features	<p>Overall CTA to be completed by 2028</p> <p><i>Assessment of existing campus design by 2022</i></p> <p><i>Implementation/upgradation to be completed by 2028</i></p>	1152 32000
2. Ensure sufficient provisioning and upkeep of visitor amenities- parking areas, food facilities, resting areas, etc.	Zoos shall include Service Level Agreements (SLA) for customer satisfaction, reduced Turn Around Time (TAT), etc. in all future contract agreements with facility management operators.	<p>Overall CTA to be completed by 2023</p> <p><i>Development of SLAs for Turn Around time etc by 2023</i></p>	Covered above
3. Improve visitor satisfaction through enhancement of connections with the city/region as well as the experiences on offer, while catering to a wide visitor demographic	Enhance connectivity with the city. Identify zoos in city master plans and formulate complimenting building regulations for surrounding areas.	<p>Overall CTA to be complete by 2023</p> <p><i>Zoos to consult city development authority to provide a no development buffer zone around zoos by 2023</i></p>	Covered above
	<p>Include zoos in local/ regional tourist circuits</p> <p>Include options of group bookings, monthly/ quarterly/ yearly memberships and run loyalty programmes.</p>	<p>Overall CTA to be completed by 2021</p> <p><i>Collaborate with local tourist agency by 2021</i></p>	Covered above



4. Offer unique attractions and experiences that caters to a wide visitor demographic and enhance the zoo experience	Provide digitally immersive experiences such as 4D shows, VR technologies in interpretation centre, etc.	Overall CTA to be completed by 2023 <i>Upgrading Interpretation Center with modern interpretive strategies by 2023 from the empaneled vendor by CZA.</i>	Covered in Pillar 5
	Create programmes that cater to diverse interests (E.g. bird watchers, photography lovers) and age groups.	Overall CTA to be completed by 2031 <i>Organize seasonal programmes (3 programmes in 1 year)</i>	4800
	Develop experiences for children based on natural play-space principles	Overall CTA to be completed by 2022 <i>Onboarding of experts to develop children based natural play spaces by 2022</i>	1152
	Ensure equal admission opportunities for all sections of society through subsidies.	Overall CTA to be completed by 2022 <i>Providing 50% discount on ticket for all age groups at least for 10 holidays/ Sundays starting 2022</i>	NA



5. Devise programmes and partnerships towards a community driven conservation mission	Partake in festivals/ celebrations that resonate with city/ region's cultural identity	Overall CTA to be completed by 2023 <i>Identify local agencies for organizing festivals</i> <i>Involve local agencies to organise festivals, setting up of kiosks, shops etc. by 2023</i>	8000
6. Strengthen branding and marketing of the zoos through merchandise, logos, colours, advertisements etc.	Formulate marketing plan	Overall CTA to be completed by 2031 starting 2022 <i>Onboarding of experts to formulate marketing plan- to start by 2022</i>	1152
	Assign a dedicate internal team and/or Public Relations consultant, to design media campaigns, develop promotional content and manage public communication	Overall CTA to be completed by 2031 starting 2023 <i>Involve dedicated PR consultant for public communication and campaign by 2023</i>	1152
	Introduce branding and marketing as a budgetary head and earmark funds under the same	NA	NA
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			56325.12

Details of Pillar 6, Initiative 1 Grade and Pay Matrix level

Grade (Level in Pay Matrix)	Designation in State Government	Position/Designation in Government of India
HAG+ Scale (Pay level 16)	Principal Chief Conservator of Forests	Additional Director General of Forests

Additional Position at the rank of IG (one number) and/or AIG (2 numbers) shall be considered in addition to the existing DIG position. See below table.



Grade (Level in Pay Matrix)	Designation in State Government	Position/Designation in Government of India
<i>(Above Super Time Scale) Senior Administrative Grade (Pay Level 14)</i>	<i>Chief Conservator of Forests</i>	<i>Inspector General of Forests</i>
<i>Selection Grade (Pay level 13)</i>	<i>Deputy Conservator of Forests (Selection Grade)</i>	<i>Assistant Inspector General of Forests</i>

Following permanent positions shall be considered with career progression in line with Wildlife Institute of India (WII)

Sr. no	Positions
1	<i>Three scientific positions</i>
2	<i>Veterinary consultant/Veterinary officer</i>
3	<i>Law Officer</i>
4	<i>SRF</i>
5	<i>JRF</i>
6	<i>Education/ outreach officer</i>
7	<i>Position for Interns shall also be considered on the basis of honorarium.</i>



Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Broaden outreach to visitors through digital platforms for pre – visit engagement and post visit experiences	Assign a dedicate internal team and/or Public Relations Officer, to design media campaigns, develop promotional content and manage public communication.	Overall CTA to be completed by 2022 <i>Onboarding of experts to design media campaigns, develop promotional content and manage public communication by 2022</i>	1152
	Maintain active presence on social media platforms	Overall CTA to be completed by 2023 <i>(go-live of website and app)</i>	1152
	Create and maintain website and mobile application		
	Update profiles on public travel sites.		



<p>2. Use digital platforms for administrative, financial operations and essential service provisioning (water, electricity etc.) to improve monitoring, Turn-Around Time (TAT) and overall efficiency.</p>	<p>Use software or digital platforms for management of inventory, vendors, contracts and other administrative operations.</p>	<p>Overall CTA to be completed by 2027 <i>(software go-live to be completed)</i></p>	<p>1152</p>
<p>3. Expand use of technology for various aspects of animal care and management that promote behavioural diversity, increase control and choice and create a cognitively complex environment of the animals.</p>	<p>Zoos to use digital software that can help to gather and manage the data rigorously.</p>	<p>Target: Overall CTA to be completed by 2031 starting 2023</p> <ul style="list-style-type: none"> <i>i. All zoos to buy ZIMS license by 2023</i> <i>ii. Renewal of the license to be done annually or suggested</i> 	<p>160000</p>
	<p>Set aside funds for procurement of new digital technologies and engaging experts for preparation of digital learning resources</p>	<p>Overall CTA to be completed by 2026 starting 2021</p> <ul style="list-style-type: none"> <i>i. Zoos to go 100% digital by 2031</i> <i>ii. Zoos to procure new digital technologies and onboard experts to start by 2021</i> 	
<p>4. Use digital technology for improving the quality of education and improve outreach</p>	<p>Covered under initiative 3</p>		
<p>Total (including 10% Contingency Fund+ 4% inflation for 10 years)</p>			<p>186339.84</p>



Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Develop innovative strategies to increase the primary revenue source	Improve earnings from souvenir shops, food facilities, audio visual tours, augmented reality shows., establish partnerships with local agencies and markets for selling of products.	<p>Overall CTA to be completed by 2023</p> <p>i. Identification of innovative strategies for revenue enhancement (expert opinion) to be achieved by 2022</p> <p>ii. Establishment of partnerships with local agencies for selling, setting up of kiosks, shops etc starting 2023</p>	6144
	Delivering curated and paid learning programs, skill development workshops, etc.(over and above existing programs) for interested participants	<p>Overall CTA to be completed by 2023</p> <p>Develop learning material and skill development workshops (experts) by 2023</p>	
	Revitalise the 'Adopt an Animal' programme using principles of good branding and marketing.	<p>Overall CTA to be completed by 2023</p> <p>Revised programme design by 2022 using principles of good branding and marketing-using partnerships, high quality advertising material, etc.</p> <p>Rolling out programme by 2023</p>	NA



2.Enable measures for cost optimization	Adopt cost optimization measures such as streamlining supply chain, outsourcing non-core activities, etc.	<p>Overall CTA to be completed by 2027</p> <p><i>Identification of key cost optimising measures (such as technology development, redesign of existing work flows etc.) by 2025</i></p> <p><i>Implementation by 2027</i></p>	NA
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			7004.16



Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
1. Foster linkages across educational institutions, government departments, community organizations and international zoos to nurture talent.	Zoo to enter into official arrangements like MoUs with likeminded organization in India and abroad.	Overall CTA to be completed by 2023 <i>Partnerships for enhancement of skill and development of skilled motivated teams by 2023</i>	6400
2. Establish promotional opportunities for key zoo personnel	Zoos should develop programs for employee enhancement such a quarterly feedback cycles and training starting by 2022	Overall CTA to be completed by 2027	6400
3. Encourage an institutional culture where employees feel valued and rewarded.	Develop integrated and structured programs for employees	Overall CTA to be completed by 2022 <i>Zoos should regularly run programs such a "employee of the year" to provide encouragement (monetary award) starting 2022</i>	400
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			15048

Pillar 10 Prioritize infrastructural upgradation, incorporating environmental sustainability measures

Initiatives	CALL to ACTION	Targets	Total cost 10 years (in Lakhs)
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<p>1. Devise a comprehensive environmental sustainability strategy including but not limited to:</p> <p>Sustainable water management</p> <p>Renewable energy forms and use products that are carbon neutral, where possible</p> <p>Innovative methods for disposal and treatment of all types of waste- both organic and in-organic utilizing concepts of circular economy.</p>	<p>Each zoo may formulate a long-term environment strategy to guide implementation of sustainability measures.</p>	<p>Overall CTA to be completed by 2025</p> <p><i>i. Appoint experts/ consultant by 2022 to develop the toolkit</i></p> <p><i>ii. Development of toolkit/guideline to encourage sustainability by 2025</i></p>	<p>5760</p>
<p>2. Reduce carbon-footprint of zoos by 10% by 2025</p>	<p>All Large and Medium Zoos to commit to sustainability targets by 2031</p>	<p>Overall CTA to be completed by 2022</p> <p><i>i. Establish MoU with national, international and global organisations by 2022</i></p> <p><i>ii. Organise quarterly workshops with partners starting 2022</i></p>	<p>6400</p>
<p>3. Embed sustainability into all aspects of zoo management, adopting international standards and innovative strategies.</p>	<p>All zoos will prescribe weightage to sustainability practices within procurement tenders Partner with local, national and global organizations to upgrade existing infrastructure along sustainable lines</p>	<p>Overall CTA to be completed by 2023</p> <p><i>Expert consultation to get inputs on sustainable practices by 2023</i></p>	<p>3840</p>
<p>Total (including 10% Contingency Fund+ 4% inflation for 10 years)</p>			<p>18240</p>



9. Annexure D: CZA Vision Plan

Pillar 1: Strengthening ex situ conservation of endangered native species guided by National Zoo Policy and adoption of the One Plan approach.

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
i. Review the species currently selected for planned conservation breeding by CZA using the five-step decision process	Status review and threat analysis of the species through literature review and consultative meetings with species experts.	Overall CTA starting 2022 and to be achieved by 2031 i. Create a workplan with meeting charter, species experts (ex-situ and in-situ) for identified species, for weekly consultative meetings with stakeholders including CZA, species experts (national and international), zoos, international zoo associations (EAZA, AZA etc.) and studbook keepers to be completed by 2022 ii. Species wise analysis to be compiled in the form of deliverable(s) and annual review starting 2023-2031 with all relevant experts.	660
ii. Identify other endangered native species that warrant ex situ conservation measures using the five-step decision process.	Feasibility assessment for establishing an ex situ program for the identified species broadly addressing, but not limited to the following targets: a) Status of the species in captivity; b) Know-how of husbandry of the species or related species; c) Literature review of adaptive potential of the species to sustainably breed in captivity; d) Potential of the ex situ	Overall CTA to be achieved by 2022 Proposal for new/revised ex situ program(s) to be finalized by 2022 along with relevant approvals and budget demand	10000



	program to assist in species restoration in the wild.		
iii. Based on the analysis and the feasibility (initiative ii), a revised list of endangered native species for planned conservation breeding programs to be taken up by CZA.	Integrated Conservation Plan derived basis the analysis and feasibility assessment with strong in situ linkages for the identified species. This shall include collaboration and integrations with international breeding programs (Global species management plans, EAZA Ex situ programs etc.)	Overall CTA starting 2023 and to be achieved by 2031 <i>Draft Integrated Conservation Plan to be prepared by 2023 with Stakeholder consultation for review/comments, by 2023 and subsequent approval and rollout</i>	Covered in Initiative 1
iv. Ensure financial assistance for taking up planned conservation breeding programs of endangered species.	Central Zoo Authority shall attempt to secure financial assistance from the Central Government to support ex situ conservation of endangered native species on an annual basis	Overall CTA to be achieved by 2023 <i>100% funding for conservation breeding programs of endangered species, especially for coordinating zoos. Same may be attempted for participating zoos along with quarterly meeting shall be held for the review and analysis- starting 2023</i>	Covered in Initiative 2
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			12152.4



Pillar 2: Maximise animal welfare at par with global standards

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1.To develop protocols to assess and improve animals' welfare in zoos borrowing from global standards	Review and update existing animal care guidelines to include aspects pertaining to nutrition, housing, reproductive, veterinary etc	Overall CTA starting 2022 and to be achieved by 2023 <i>i. Involve experts to develop and review guideline by 2022</i> <i>ii. Draft animal care guidelines by 2023</i>	480
2. To ensure that housing conditions of all animals in recognized zoos are as per standards prescribed by the CZA	Dynamic communication with zoos based on review and inclusion of aspects mentioned in reports submitted to CZA	Overall CTA starting 2023 and to be achieved by 2031 <i>Annual review of housing condition and other related animal welfare infrastructure – starting from 2023 until 2031 (this shall include onboarding of experts)</i>	
3. Continued commitment to review and expand the scope of animal care guidelines	Develop taxa-wise protocols (checklists etc.) to complement existing evaluation modality and MEE for regular welfare assessment.	Overall CTA starting 2021 and to be achieved by 2031 <i>i. Include additional indicators as per the taxa-wise protocols by 2021</i> <i>ii. Update checklist to assess animal welfare practice by 2022</i> <i>iii. Utilize the comprehensive checklist to annually review the animal welfare practice starting from 2022</i>	96
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			656.64



Checklist to review the designs of animal exhibits- Pillar 2, Initiative 2 of CZA Vision Plan

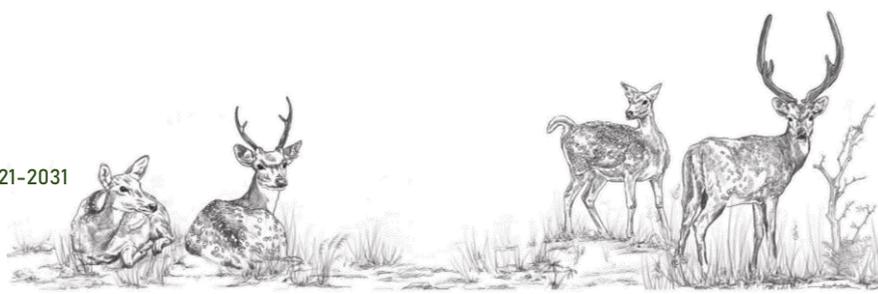
CHECKLIST TO REVIEW THE DESIGNS OF ANIMAL EXHIBITS

- Is the species naturally comfortable in the zoo’s natural climate or can it be kept comfortable through access to artificial environments?
- Does the exhibit allow for an animal to regulate its basic condition; to access sunlight (or moonlight in nocturnal species) and the outdoors at their choice?
- Do the animals use the ‘third dimension’ such as height or depth; do they enjoy trees or digging in various substrates?
- Are resting places incorporated and does the exhibit allow for normal movement?
- Is the exhibit large and complex enough to support the species’ natural grouping?
- Are complementary exhibits available to accommodate breeding or the fracturing of a social group?
- Is the exhibit providing for multiplicity of opportunities, such as feeding and resting, in varied conditions (being near or far, in shade or sunshine, elevated or low, protected or exposed to elements)?
- Does the exhibit provide escape and retreat areas for animals? What triggers aggression?
- Are animal keepers safe around the animals in exhibit?
- Does the exhibit provide easy flexible options for daily maintenance and environmental enrichment?
- Does the exhibit allow staff members and researchers to monitor the animals without disturbance? Are animals on exhibit protected from disturbing light, noise or vibration associated with being viewed?
- Are animals safe from visitors? Are visitors safe around the animals?
- Is the welfare of animals on exhibit well understood by visitors?
- Is the visitors’ experience tied to understanding the challenges of the species’ survival in the wild?

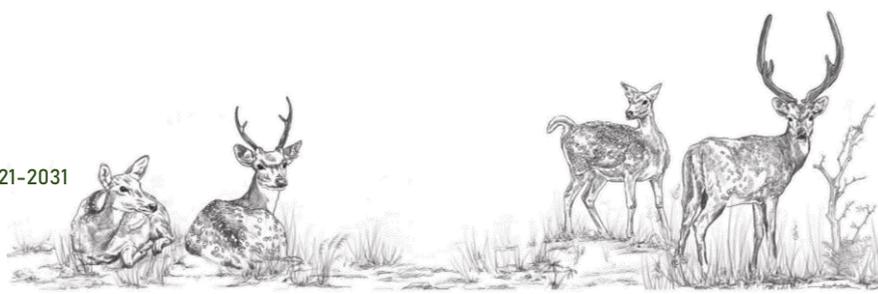


Pillar 3: Advance management of rescued animals through updation of policy and guidelines

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1. Policy on the management and placement of rescued animals accepted by zoos for short-term or long-term housing.	Expand the scope of the existing policies to specifically address aspects pertaining to acceptance of rescued animals by zoos, housing, aspects of habituation, movement between zoos, and their husbandry to facilitate their release in the wild.	<p>Overall CTA to be achieved by 2024</p> <p>i. <i>Constitute a committee with experts to develop this framework by 2022</i></p> <p>ii. <i>Develop a long-term policy framework specifically focused on the management and placement of rescued animals with experts by 2024</i></p> <p>iii. <i>Thereafter, annual review to be undertaken.</i></p>	480
	Review of existing statutory provisions, literature review on husbandry requirements of rescued animals and develop a framework for safe, ethical and efficient handling of animals during rescue operations.	<p>Overall CTA to be achieved by 2022</p> <p><i>Review with help of committee of experts to develop this framework by 2022. Thereafter, annual review to be undertaken.</i></p>	
2. Notify guidelines on the husbandry requirements of rescued animals.	Based on extant guidelines, literature review and expert consultations, derive species/taxa-specific guidelines for short-term and long-term housing of rescued specimens (with special emphasis on species involved in frequent human-animal conflict).	<p>Overall CTA starting 2022 and to be achieved by 2023</p> <p>i. <i>Involvement of experts to develop and review guideline by 2022</i></p> <p>ii. <i>Draft species/taxa-specific guidelines for short-term and long-term housing of rescued specimens by 2023</i></p> <p>iii. <i>Thereafter, annual review to be undertaken.</i></p>	240
	Develop criteria to assess level of habituation in rescued animals (under short-term or long-term care) prior to release in the	<p>Overall CTA starting 2022 and to be achieved by 2024</p> <p>i. <i>Form a committee of experts/scientists and veterinarians to study best</i></p>	

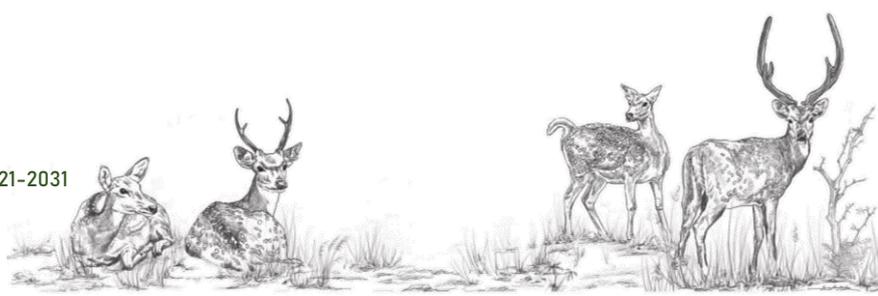


	wild (e.g. an index for the degree of habituation).	<p><i>practices adopted for short- and long-term housing by 2022.</i></p> <p><i>ii. Develop criteria to assess the level of habituation in rescued animals (this may include consultation with expert) by 2023</i></p> <p><i>iii. By 2023 a comprehensive checklist to be prepared and to be used for the assessment</i></p> <p><i>iv. Notification of guideline on the husbandry requirements of rescued animals and checklist to be circulated to zoo by 2024</i></p>	
3 Prepare guidelines for the efficient release of rescued animals accepted by zoos in the wild.	Based on principles of the reintroduction biology, extant guidelines and expert consultations, develop Standard Operating Procedures (SOPs) (targeted at taxa level) for the release of animals in the wild.	<p>Overall CTA starting 2021 to be achieved by 2023</p> <p><i>SOP (taxa level) formulation for the release of animals in wild - to finish (this may include onboarding of experts) by 2023</i></p>	96
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			1094.4



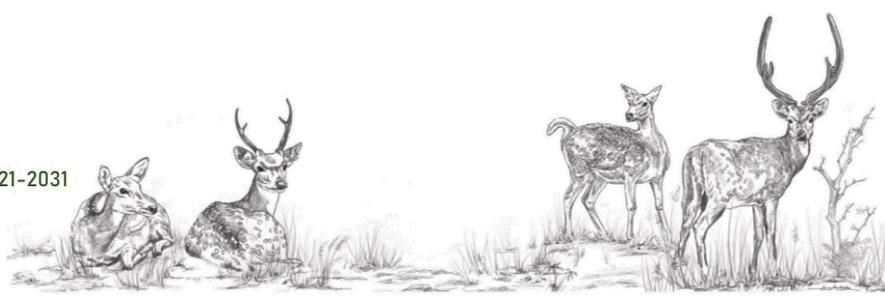
Pillar 4: Catalyze science-based conservation action in zoos

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1 Zoos function as centres for both basic and applied research by promoting collaborations with academic and scientific institutions.	Zoos have access to current literature related to zoo science. An online repository of materials related to ex-situ conservation research shall be developed to this end, which shall also include research reports from CZA-funded projects.	<p>Overall CTA to be achieved by 2021</p> <p>i. Creation of an online portal//tab on the CZA website for a repository of materials related to ex-situ conservation research and successful projects funded by CZA by 2021.</p> <p>ii. The online portal to be updated monthly by 1 designated person, in charge of maintenance of the online repository.</p>	36
	Promote formal collaborations with local/national/international universities, organizations and research institutions.	<p>Overall CTA to be achieved by 2022</p> <p>Identification of the possible collaboration and signing of the Agreements with them for research and capacity building starting 2022</p>	300
2 Promote science-based management in zoos by initiating systematically funded research projects	Strengthen small grants research program by actively promoting zoos to take up relevant short-term/long-term research to improve zoo management.	<p>Overall CTA to be achieved by 2022</p> <p>Revision for the small grants program (eligibility, application process, fund) by 2022.</p>	3200
	Enforce recruitment of mandated technical and scientific personnel by zoos. CZA shall also aim to regularly revise these guidelines.	<p>Overall CTA starting 2021 and to be achieved by 2022</p> <p>i. CZA will revise the guidelines for the scientific management of zoos and ensure compliance of the recruitment of scientific and technical staff through annual review- starting 2021.</p>	240
		<p>ii. CZA shall also fund the zoos (need basis) for the recruitment of scientific and technical staff at the zoos starting 2022</p>	2400



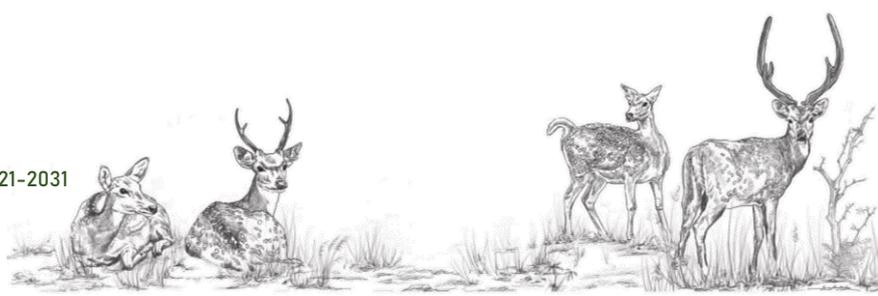
Pillar 5: Steer zoos to function as learning institutions by (having a) long-term conservation education plan as part of the Master Plan

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1 Set standards and best practice guidelines for education using a coordinated approach.	Consultation with educators and experiential learning experts to create a document that will outline standards and best practices that Indian Zoos can implement in terms of education strategies and programs.	<i>Overall CTA starting 2022 and to be achieved by 2031</i>	
		<i>i. Monthly consultative meetings with stakeholders including CZA, education experts (national and international), zoos, international zoo associations (EAZA, AZA etc.) – to begin by 2022.</i>	19.2
		<i>ii. Conduct workshops- starting 2022</i>	120
		<i>iii. Draft the standardised document on Conservation Education Plan by 2023.</i>	38.4
		<i>iv. Annual review and upgradation of plan, starting 2023-2031 with all relevant experts</i>	19.2
<i>Total (including 10% Contingency Fund+ 4% inflation for 10 years)</i>			202.464



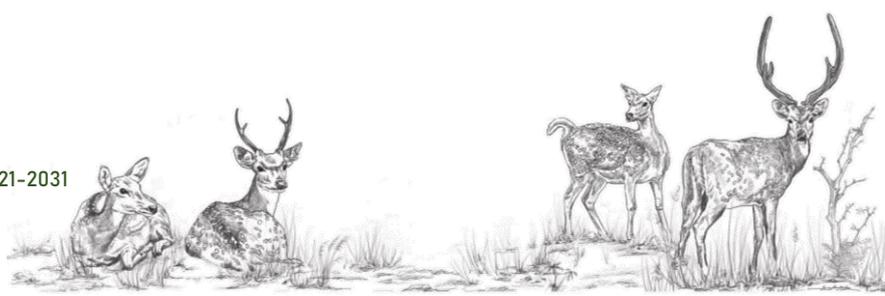
Pillar 6: Establish an experienced team of ex-situ conservation management personnel

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1 Invest in people to attract and retain talented and accomplished staff at all levels	Upgrade existing staffing standards to include core competencies, responsibilities and suggested growth trajectories	Overall CTA to be achieved by 2021 <i>Analysis of the existing standards for core competencies, responsibilities. (to be done through experts) – 2021</i>	96
	Member Secretary shall be upgraded to at least APCCF or equivalent with the Pay Matrix Level 16	Overall CTA to be achieved by 2022 <i>i. Draft new standards to include new and permanent positions, revised competencies and responsibilities. (this shall include revisions in the pay scale) – experts’ opinion for drafting the revised staffing standards (expenditure covered above) by 2022</i> <i>ii. Office space to be provided for the new positions created (procurement of computer/table/chair etc) by 2022</i>	Same as above 400
2 Encourage an institutional culture where employees feel valued and rewarded	Provide staff with regular training and adequate infrastructure within CZA office premises for development opportunities, supporting performance and growth.	Overall CTA to be achieved by 2021 <i>Quarterly workshops shall be conducted for employee trainings (3rd party experts) and quarterly feedback cycles on employee performance for enhanced growth, starting 2021</i>	40
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			611.04



Pillar 7: Infrastructural upgradation, incorporating environmental sustainability measures

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1. Devise a comprehensive sustainability strategy and practice guidelines for CZA,	Adopt sustainable practices within CZA premises and overall CZA functioning	<p>Overall CTA starting 2021 and to be achieved by 2023</p> <ul style="list-style-type: none"> <i>i. Conduct a sustainability audit for CZA (experts to be involved) – 2021</i> <i>ii. Adoption of practice manual 2022 (experts)</i> <i>iii. Procurement of equipment to promote sustainability by 2023 (ongoing activity)</i> 	<p>72</p> <p>1000</p>
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			1222.08

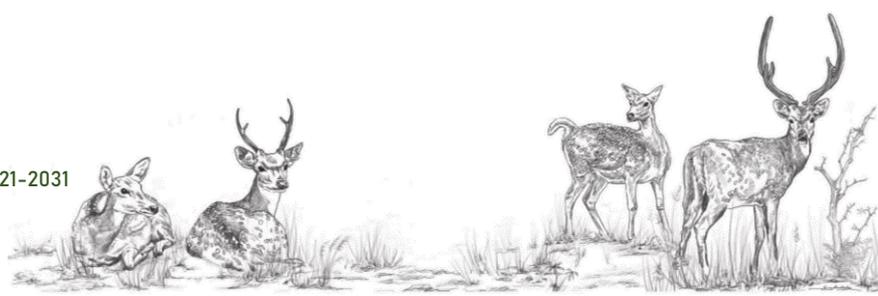


Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare

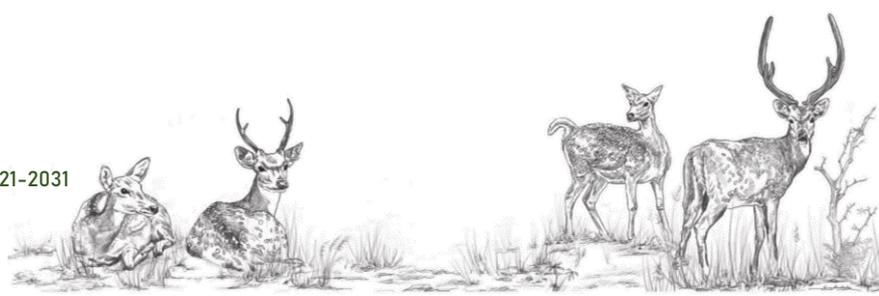
Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1 Standardize financial reporting across the country.	Institutionalize mechanisms such as iMIS for standardized financial reporting of zoos	Overall CTA starting 2021 and to be achieved by 2022 <i>i. CZA to complete development (one time) of iMIS software by 2021 and push for enforcement in all zoos by 2022. iMIS application to be maintained/ upgraded on a yearly basis.</i>	4.5
2 Develop innovative strategies to optimize and increase revenue sources, including but not limited to tapping of relevant government schemes, introduction and optimization of renewal fee/registration fee of zoos etc.	Convergence with Government departments and secure funds	Overall CTA starting 2021 and to be achieved by 2023 <i>i. Convergence with government departments and their existing schemes - to start by 2021. These convergence may include-Ministry of Social Justice and Empowerment- , Ministry of Tourism etc.</i> <i>ii. CZA to secure funds or explore funds under CSR budget, for training and capacity building of zoo officials by 2023</i>	500
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			575.13

Pillar 9: Support zoos in enhancing visitor experience through immersive and inclusive design

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
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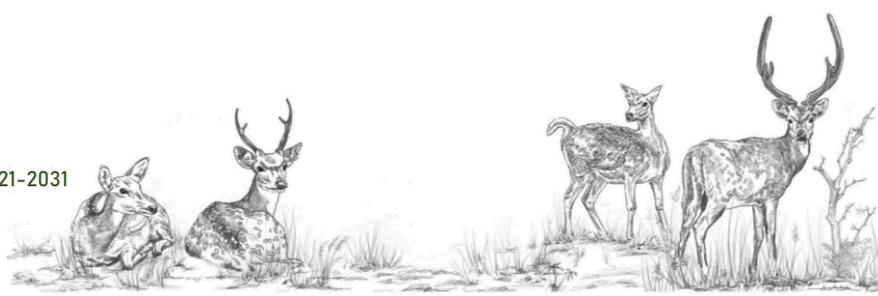
<p>1 Work towards enabling naturalistic zoo campuses that are climate responsive, reflective of regional ecology, environmentally sustainable and universally accessible</p>	<p>Enhance focus on the following aspects:</p> <p>Empanelment of design consultants</p> <p>Regular modification and upgradation of zoo design standards- Setting out a modified and upgraded guideline, that can guide zoos to include naturalistic design approach as the part of design and planning of zoo campus enabling immersive experience to the visitors.</p> <p>Development of zoo design curricula as part of architecture pedagogy and formal partnerships for adoption of curriculum</p> <p>Promote modern zoo design elements as part of CZA review of enclosure drawings</p> <p>Build collaborations with international individuals and organizations with expertise in zoo design to enable zoo to access state-of-the-art enclosure designs</p> <p>Involvement of species experts as part of design review.</p>	<p>Overall CTA starting 2021 and to be achieved by 2022</p> <p>i. Prepare RFP document for the empanelment of design consultants by 2021 and empanel design consultants by 2021. Run empanelment process every 3 years.</p> <p>ii. Involve design experts to develop the revised zoo design guideline by 2024. Involve design experts to develop the revised zoo design guideline by 2024. Revised Zoo design guideline to be drafted by the expert by 2025</p> <p>iii. Formal collaboration and development of zoo design curricula with architecture/design institutions by 2021</p> <p>iv. Annual design review session to begin at immediate effect and to continue till 2031. At least, 2 design experts and 1 species specific expert to be included as part of the design review.</p> <p>v. Establishing an MOU with global zoo design experts to get inputs on advanced enclosure designs by 2022</p> <p>vi. Quarterly workshops with international zoo design experts are required- start by 2022.</p>	<p>72.9</p> <p>36</p> <p>200</p> <p>240</p> <p>500</p> <p>40</p>
	<p>CZA will upgrade the standards for provisioning of basic amenities in zoos</p>	<p>Overall CTA starting 2022 and to be achieved by 2023</p> <p>i. Involvement of WASH experts to develop the standardised guideline by 2022.</p> <p>ii. Drafting standardised document that stipulates the provision of</p>	<p>21.6</p>



		<i>basic amenities and WASH facilities in zoo by 2023.</i>	
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			1265.97

Pillar 10: Leverage technology to expand outreach, impact and overall efficiency of Indian Zoos

Initiatives	CALL to ACTION	Target	Total cost 10 years (in Lakhs)
1 Use digital technology for improving the quality of education and reach more than 1 billion persons per year	CZA will provide technical support, advice and funding where possible on innovative approaches to digital learning resources for zoos	<p>Overall CTA starting 2022 and to be achieved by 2023</p> <p><i>i. Development of toolkit/guideline to encourage technology enablement at the zoos – 2023</i></p> <p><i>ii. CZA to provide funding for tech- enablement at the zoos by 2022</i></p>	<p>28.8</p> <p>4000</p>
Total (including 10% Contingency Fund+ 4% inflation for 10 years)			4592.8

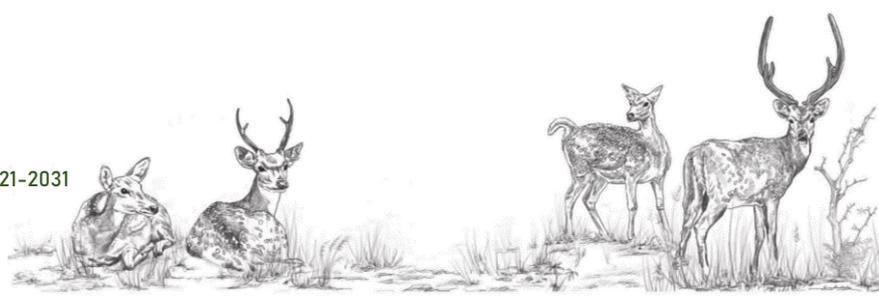


10. Annexure E: 15 Zoos

Important: The financial outlay is over and above current spending that zoos are already incurring and hence, restricted to additional activities (specified in this Vision Plan) that zoos will undertake in the future to work towards global standards. Further, the numbers are approximated using assumptions and past data and are only indicative in nature. They are inclusive of contingency funds and 4% inflation across 10 years.

Assam State Zoo cum Botanical Garden

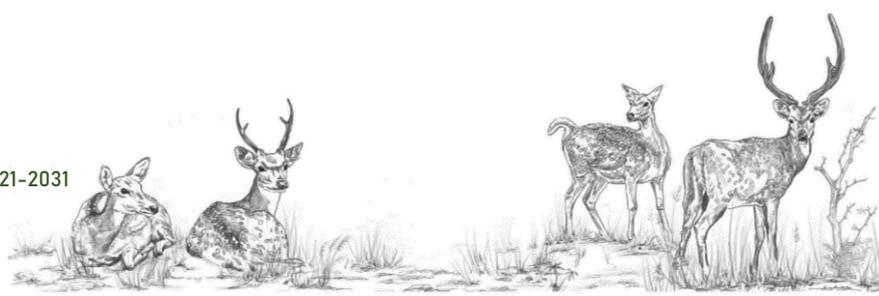
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	477
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44



goals of biodiversity conservation and animal welfare		
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
	Total	4166

Arignar Anna Zoological Park, Chennai

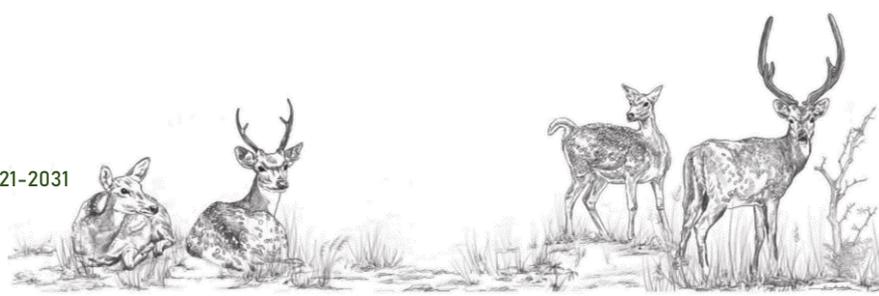
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	152
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	570
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	697



Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
Total		3893

Bhagwan Birsa Biological Park, Ranchi

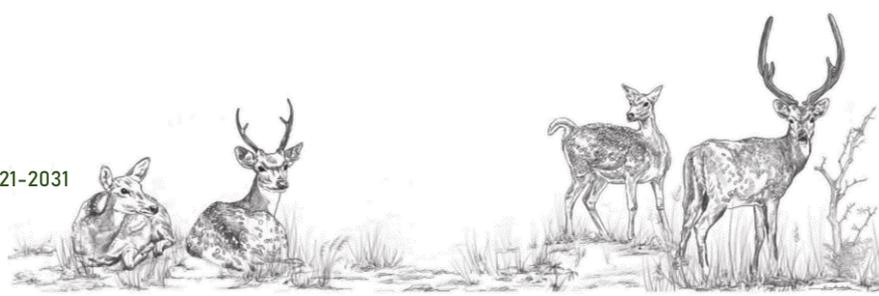
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	536
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals,</i>	107



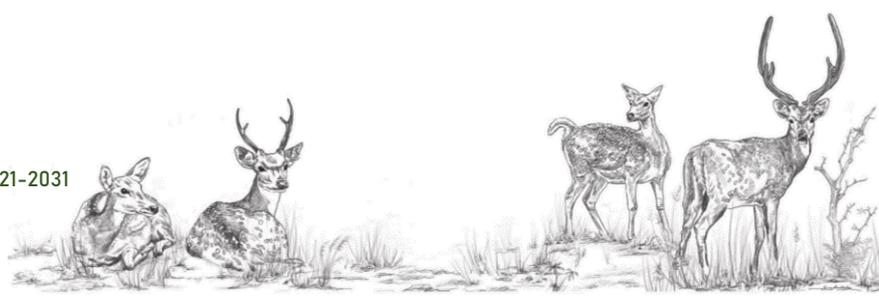
	<i>annual cost for ZIMS license, conducting of workshops etc</i>	
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
	Total	4247

Indira Gandhi Zoological Park, Vishakhapatnam

Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371

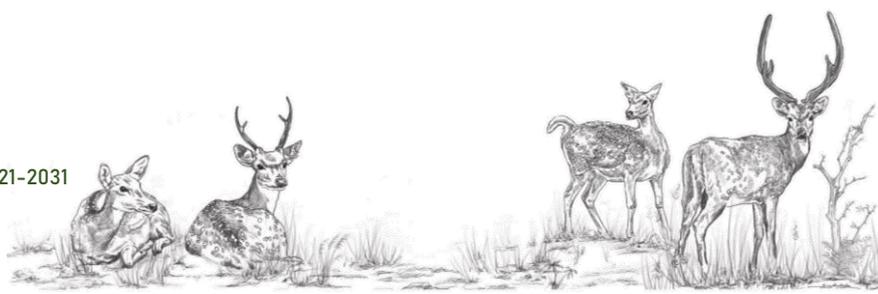


Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	477
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	107
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	697
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
	Total	4158



M.C. Zoological Park, Chhatbir, Punjab

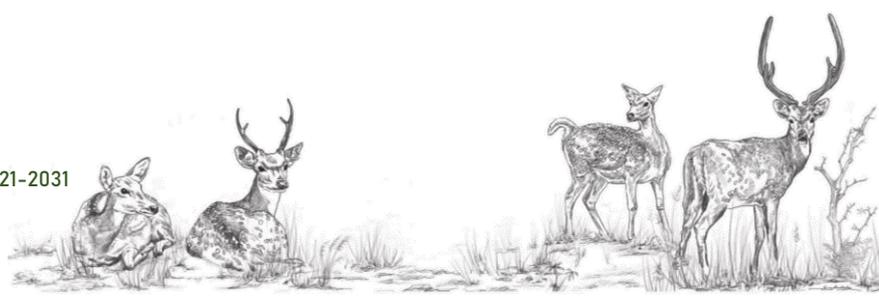
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	152
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	477
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94



Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
Total		3927

Nandankanan Zoological Park, Bhubaneswar

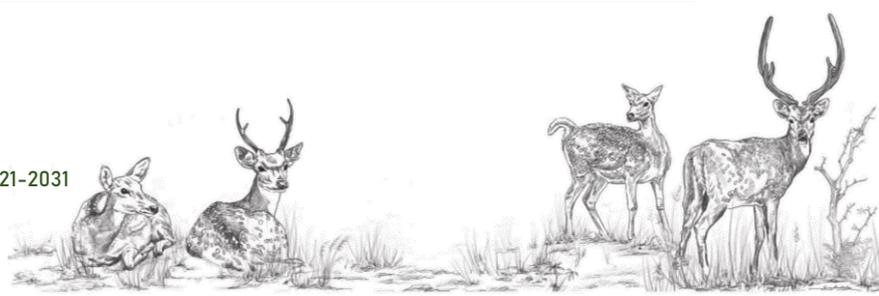
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	477
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	697
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165



Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
Total		4112

Nawab Wajid Ali Shah Zoological Garden, Lucknow

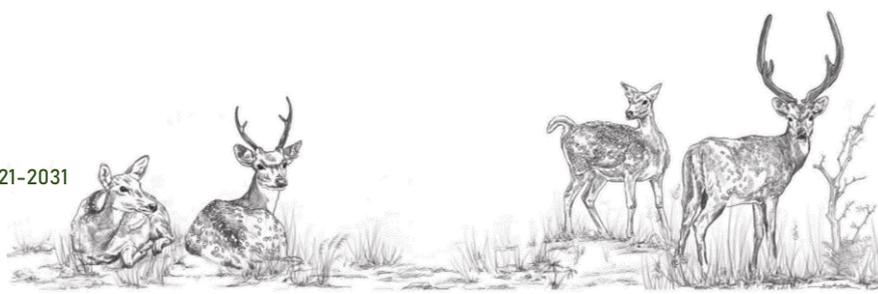
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	152
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	442
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	107
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	697



Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
Total		3846

Nehru Zoological Park, Hyderabad

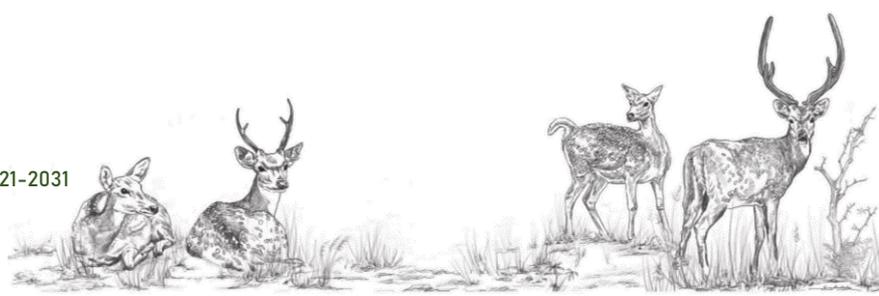
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	152
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	442
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals,</i>	120



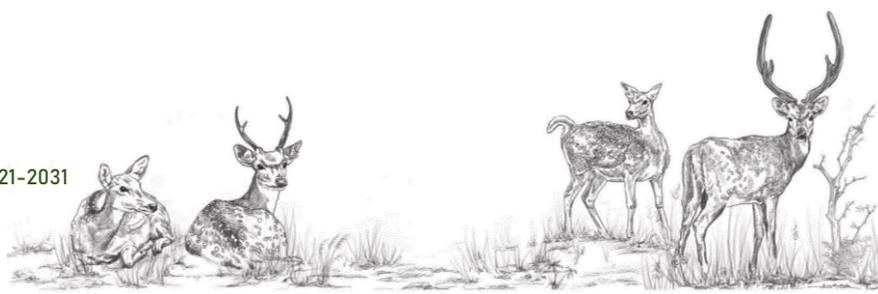
	<i>annual cost for ZIMS license, conducting of workshops etc</i>	
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	697
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
	Total	3858

Sri Chamarajendra Zoological Gardens, Mysuru

Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	152

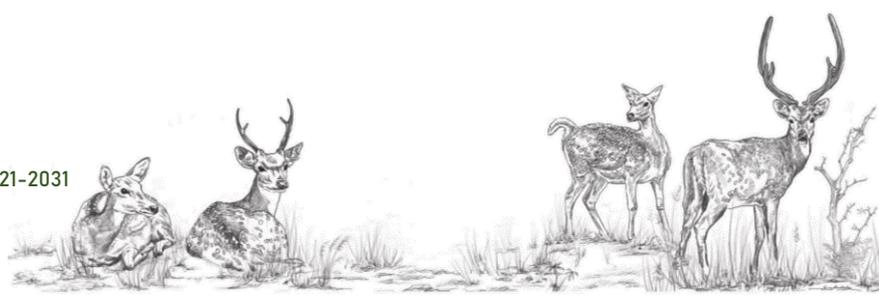


Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	442
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	1153
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
Total		INR 4314



Van Vihar National Park and Zoo, Bhopal

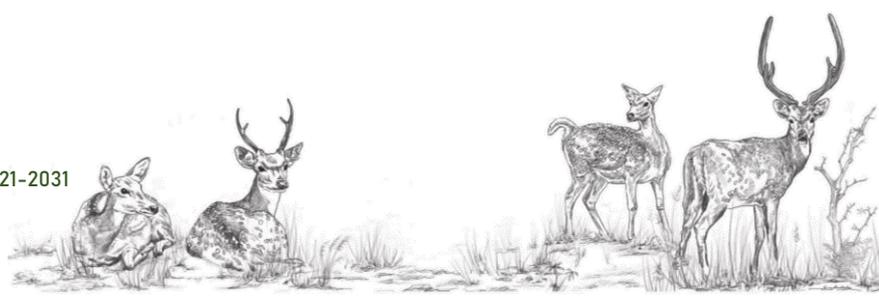
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	152
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	442
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	107
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94



Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
Total		3900

Sanjay Gandhi Biological Park, Patna

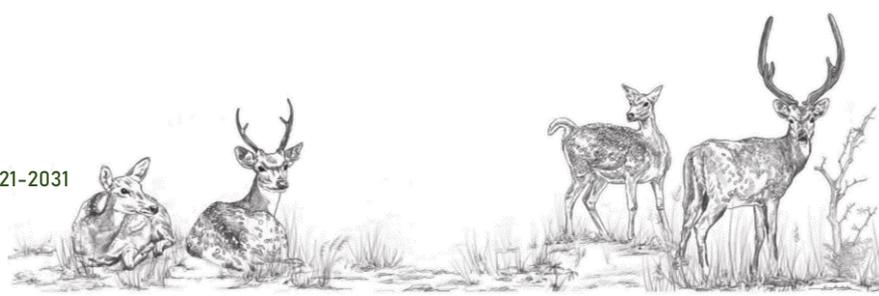
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	570
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165



Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated, and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
Total		4260

Padmaja Naidu Himalayan Zoological Park, West Bengal

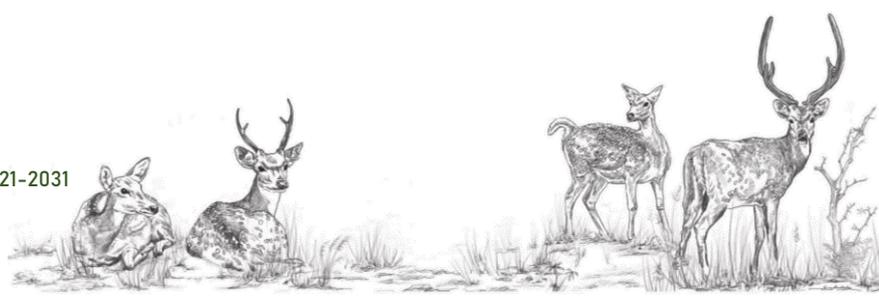
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	570
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	120
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731



Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	93
Total		4239

Rajkot Zoological Park, Rajkot

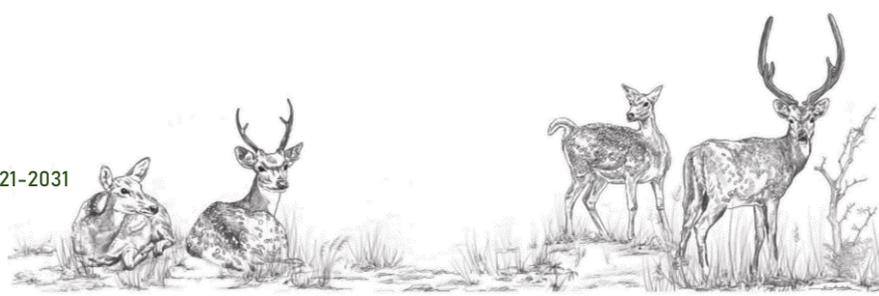
Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	536
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals,</i>	107



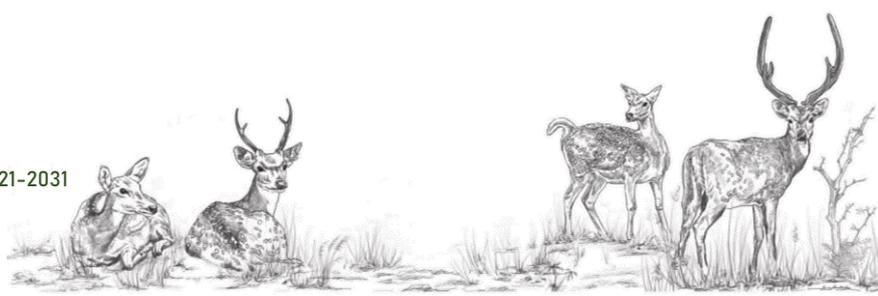
	<i>annual cost for ZIMS license, conducting of workshops etc</i>	
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
	Total	4213

Machia Biological Park, Jodhpur

Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371

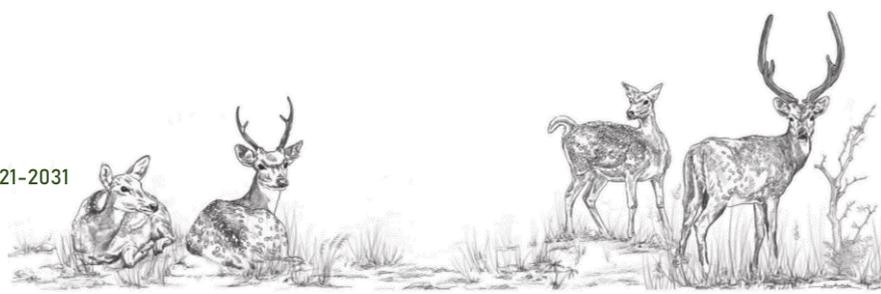


Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	570
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	107
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94
Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
Total		4247

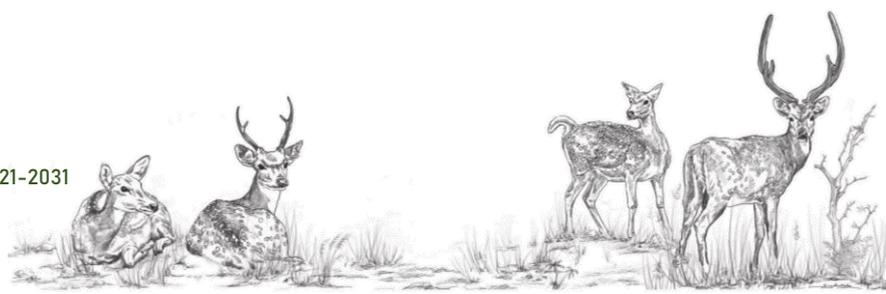


Nandanvan Jungle Safari, Naya Raipur

Pillars	Key interventions	Total cost 10 years (in Lakhs)
Pillar 1: Strengthening ex situ conservation of endangered native species guided by CZA policy and guidelines to contribute to national biodiversity conservation efforts.	<i>Involvement of experts, conducting workshops etc.</i>	371
Pillar 2: Optimize animal welfare to achieve parity with concurrent global policies	<i>Involvement of experts, upgradation of enclosure design, conducting of workshops and trainings etc.</i>	700
Pillar 3: Management of rescued animals	<i>Involvement of experts, infrastructure upgradation, procurement of rescue related infrastructure, conducting of workshops etc.</i>	477
Pillar 4: Catalyze science-based conservation action in zoos	<i>Involvement of experts, onboarding of zoo personnel, publication of journals, annual cost for ZIMS license, conducting of workshops etc</i>	107
Pillar 5: Zoos as lifelong learning institutions for all ages and abilities, fostering linkages between society and nature	<i>Running internship programmes, functionalizing/construction of an interpretation centre, publication of IEC material, collaboration and partnership with organisations etc.</i>	731
Pillar 6: Enhance visitor experience through immersive and inclusive design	<i>Involvement of experts, curation of specialised programs etc.</i>	352
Pillar 7: Leverage technology to expand outreach, overall efficiency and improve animal welfare	<i>Involvement of experts, procurement for technological advancements etc.</i>	1165
Pillar 8: Build financially sustainable business models prioritizing fiscal autonomy while being aligned with goals of biodiversity conservation and animal welfare	<i>Involvement of experts, development of learning material and collaboration and partnership with local agencies etc.</i>	44
Pillar 9: Develop skilled, motivated and empowered teams, for all facets of zoo management	<i>Involvement of experts, conducting trainings, running of programs etc.</i>	94



Pillar 10: Prioritize infrastructural upgradation, incorporating environmental sustainability measures	<i>Involvement of experts, development of toolkit, engagement with international organisations etc.</i>	114
Total		4154



Key contributors

Members of Committee constituted on 22.10.2019 for formulating ‘Vision plan of 15 Zoos to global standards besides strengthening of CZA ‘

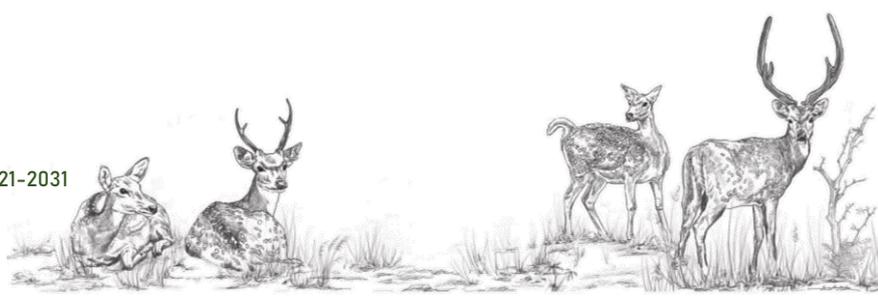
- Dr. Rajesh Gopal (IFS), Secretary-General, Global Tiger Forum, New Delhi
- Dr. S. P. Yadav (IFS), Member Secretary, Central Zoo Authority
- Mr. Abhilash Khandekar, Senior Journalist
- Dr. Rabindra Kumar Singh (IFS) Principal Chief Conservator of Forests & Head of Forest Force (Retired), Chattisgarh
- Mr. P.C.Tyagi (IFS) Senior Professional Fellow, WII, Dehradun, Former PCCF & CWLW (HoFF) (Retired), Tamil Nadu
- Dr. Rommel Mehta, Former HOD, Dept. of Landscaping & Architecture, SPA Delhi
- Dr. P. K. Malik, Scientist G, Head, Department of Wildlife Health Management, WII, Dehradun (Retired)
- Dr. Bitapi Sinha, Scientist G, WII, Dehradun
- Dr. K. Ramesh, Scientist E, WII, Dehradun

Other Contributors

- Dr. Abhijit Pawde, Principal Scientist, Indian Veterinary Research Institute
- Dr. Aarti Grover, Associate Professor, School of Planning and Architecture
- Dr. Karthikeyan Vasudevan, Senior Principal Scientist, CCMB, Laboratory for Conservation of Endangered Species (LaCONES)
- Dr. Sonali Ghosh, Deputy Inspector General Forest, Central Zoo Authority
- Dr. Gowri Mallapur, Veterinary Consultant, Central Zoo Authority
- Mr. Lakshminarasimha R., Scientific Officer, Central Zoo Authority
- Dr. Devender Kumar, Evaluation and Monitoring Officer, Central Zoo Authority
- Mr. T. Ajay Kumar, Evaluation and Monitoring Assistant, Central Zoo Authority
- Mr. Vivek Goel, Data Processing Assistant, Central Zoo Authority
- 15 PILOT ZOO INCHARGE AND THEIR TEAMS

Dr. Siddhanand Kukrety (IFS), Additional Principal Chief Conservator of Forests & Director (FAC)- **Nehru Zoological Park, Telangana**; Dr. Nandani Salaria (IFS) Curator - **Indira Gandhi Zoological Park, Visakhapatnam**; Mr. Naresh Mahajan (IFS), Field Director, **Mahendra Chaudhary Zoological Park, Punjab**; Mr. Manoj Mahapatra (IFS) Director, **Nandankanan Zoological Park, Odisha**; Ms. Mercy Bella (IFS) Director - **Nandanvan Jungle Safari (Naya Raipur), Chhattisgarh**; Mr. R. K. Singh (IFS) Director - **Nawab Wajid Ali Shah Zoological Garden, Uttar Pradesh**; Dr. R.K. Hirpara, Zoo Superintendent - **Rajkot Municipal Zoo, Gujarat**; Mr. Satyajeet Kumar (IFS) Director - **Sanjay Gandhi Biological Park, Bihar**; Ajit Kulkarni (IFS), DCF and Executive Director- **Sri Chamarajendra Zoological Gardens, Karnataka**; Dr Basavaraj S. Holeyachi (IFS), **Director Padmaja Naidu Himalayan Zoological Park, West Bengal**; Ms V. Karunapriya (IFS), Additional Principal Chief Conservator of Forests & Director, **Arignar Anna Zoological Park, Chennai**; Mr. Ajay Yadav (IFS) Director - **Van Vihar National Park Zoo, Madhya Pradesh**; Mr Ashwini Kumar, (IFS) Director, **Assam State Zoo cum Botanical Garden, Assam**; Mr Jabber Singh (IFS), **Director, Bhagwan Birsa Biological Park, Jharkhand**; Mr Vijay Borana (IFS) **Deputy Conservator of Forest (WL) and Director, Machia Biological Park, Rajasthan**; Mr. D. Venkateswarlu, (IFS) Former Director, **Bhagwan Birsa Biological Park, Jharkhand**; Dr. M. Sudhagar, (IFS), Former Director, **Mahendra Chaudhary Zoological Park, Punjab**; Ms. Kamalika Mohanta (IFS), Former Director- **Van Vihar National Park Zoo, Madhya Pradesh**; Mr Shashi Paul (IFS), Former Director- **Nandankanan Zoological Park, Odisha**; Mr Amit Kumar (IFS), former Director - **Sanjay Gandhi Biological Park, Bihar**; Mr Debashish Jana (IFS) (Additional Principal Chief Conservator of Forests & former Director) - **Arignar Anna Zoological Park, Chennai** ; Mr. Dharamdeo Rai (IFS) Former Director - **Padmaja Naidu Himalayan Zoological Park, West Bengal**; Mr. Tejas Mariswamy (IFS) (Divisional Forest Officer and former Director) - **Assam State Zoo Cum Botanical Garden, Assam**; Mr. Y.K Das (IFS) former Director - **Bhagwan Birsa Biological Park, Jharkhand**; Mr. Mahesh Kumar Choudhary (IFS), Deputy Conservator Of Forest (Wildlife), former Officer-in-Charge **Machia Biological Park, Rajasthan**.

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NOTES

A series of horizontal dotted lines for writing notes.



CONTACT US AT:

**B-1 Wing, 6th Floor, Pandit Deen
Dayal Antyodaya Bhawan,
CGO Complex, Lodhi Road,
New Delhi - 110003**

Email: cza@nic.in

Tel: +91-011-24367851/52

