

Subject : Submission of proposal for NATIONAL CAMPA funds (20-21)

Proposal 1 : Formulating an integrated species recovery plan for threatened species

Proposal 2 : Setting up national referral centre for wildlife disease monitoring and prevention

Background

The Central Zoo Authority (CZA), is a statutory body under the Ministry of Environment, Forest and Climate Change, Government of India. It was created in 1992 through an amendment to the Wildlife (Protection) Act, 1972, to oversee the functioning of Indian zoos and provide them professional guidance and technical assistance. The objectives of the CZA are enforcing the minimum standards and norms for the housing, upkeep and healthcare of captive animals in Indian zoos and checking mushrooming of unplanned and ill-conceived zoos. More than 160 zoo and rescue centers are recognized by the CZA across the country. These zoos carry out multitude of activities ranging from conservation awareness, display of rare and exotic fauna, rescue and rehabilitation and conservation breeding programs for threatened species. Over 550 species are currently housed in Indian zoos, of which nearly 150 are endangered. With close to 70 million annual visitors, zoos serve as an ideal location for nature education and awareness. Hence, by means of ex situ conservation zoos have a great potential to significantly contribute to conservation of threatened Indian wildlife.

In the last 27 years, CZA has carried out its objectives through a regulatory phase that helped control the illegal mushrooming of zoos and display of animal exhibits in the country. The CZA has ensured high standards for scientific management and implementation to maximize animal welfare, assist conservation breeding and conservation outreach in Indian zoos. It is therefore the next logical step to move towards the facilitation phase and create linkages to complement in-situ conservation strategies.

The CAMPA Act or Compensatory Afforestation Fund Act (CAMPA), 2016 aims to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses. Under the CAMPA ACT 2016,

Section 5 (iii), "the monies available in the National Fund shall be disbursed and utilized in the following manner namely ;

(iii) the expenditure incurred on specific schemes approved by governing body of the National Authority.

Explanation.—For the purposes of this section, "scheme" includes any institute, society, centre of excellence in the field of forest and wildlife, pilot schemes, standardization of codes and guidelines and such other related activities for the forestry and wildlife sector. "

With this background, the following proposals are being submitted for kind consideration for utilization of the National CAMPA funds.

Proposal 1: Formulating an integrated species recovery plan for threatened species

According to the 3rd National Wildlife Action Plan (2017-2031), “several species of flora and fauna in the country are highly threatened due to over exploitation, habitat degradation and loss. Such species especially endangered and critically endangered need immediate conservation measures by way of conducting status surveys, preparation of recovery plan and identification and protection of critical habitats. In most cases in-situ conservation has to be given the highest priority backed by conservation breeding (ex situ conservation) in case of species which are critically endangered”.

Similarly, under CSS schemes of integrated development of wildlife habitat, “the state governments are encouraged to identify habitats for highly threatened species of flora and fauna outside the PAs and undertake conservation and long-term monitoring of such habitats”. Further it also states the following action required that lie within the purview of CZA mandate: “develop capacity for ex situ conservation and multiplication of threatened taxa”. In this regard, the proposed actions assigned to CZA are:

- a) Develop husbandry protocols for the conservation breeding and reintroduction of select threatened Indian fauna in accordance with the IUCN guidelines and state-of-the-art conservation practices.
- b) Develop a centralized database of available information for identified species that leads to their successful ex-situ conservation and restoration in natural habitats.
- c) To develop a cadre of trained wildlife biologists and botanists and build their capacity in ex-situ conservation. conservation breeding.

The Central Zoo Authority has pioneered the conservation breeding of threatened Indian wildlife nearly a decade ago. As part of this initiative, 73 threatened species of reptiles, birds and mammals found in India were identified for focused breeding in Indian zoos with the objective to establish physically, behaviorally and genetically healthy population in captivity and to further use them for species restoration, if need arises.

The CZA also published the first “Guidelines/Norms for Conservation Breeding Programme of the Central Zoo Authority” in 2011. As part of this, 25 species were provided financial assistance by the Central Zoo Authority. This includes 17 threatened species (3 Critically Endangered, 5 Endangered and 9 Vulnerable species). Cumulatively, the CZA has provided more than 6 crore funding to these programs between 2014-15 to 2019-20.

These ex situ programs established for conservation purposes fall under the category of Insurance population (maintaining a viable ex situ population of the species to prevent predicted local, regional or global species extinction and preserve options for future conservation strategies) as described in the “IUCN Species Survival Commission Guidelines on the Use of Ex situ Management for Species Conservation Version 2.0”. Over eight years following the inception of conservation breeding programs, the following are the key achievements (for details refer to Table 1):

- Five breeding programs viz. Indian Chevrotain (*Moschiola indica*), White-rumped Vulture (*Gyps bengalensis*), Indian Vulture (*Gyps indicus*), Northern Pig-tailed Macaque (*Macaca leonina*), Lion-tailed Macaque (*Macaca silenus*), Cheer Pheasant (*Catreus wallichii*) have resulted in the establishment of captive population with more than 50 individuals (range: 264-56).

- Six species viz. Slender-billed Vulture (*Gyps tenuirostris*), Greater One-horned Rhino (*Rhinoceros unicornis*), Western Hoolock Gibbon (*Hoolock hoolock*), Western Tragopan (*Tragopan melanocephalus*), Phayre's Leaf-monkey (*Trachypithecus phayrei*) have resulted in the establishment of captive population with more than 30 individuals (range: 48-24) in captivity as part of organized breeding programs.
- Established science-based protocols for the conservation breeding of the above species.
- Cheer Pheasant conservation breeding program in Himachal Pradesh has led to the first-ever successful reintroduction of the species in the wild in the country.

Further, it is also envisioned to align the prioritized species by the CZA with those listed by the Ministry of Environment, Forest and Climate Change under the 'Integrated development of Wildlife Habitats' scheme. As part of this, a consolidated list of species with the goal to upscale and integrate all the above activities and devise a unified plan consistent with the concept of 'IUCN CPSG's One Plan approach to conservation'. The aim would be to 'converge' and employ a multi-faceted approach including aspects of habitat, conservation breeding (in case of endangered and critically endangered species) and species restoration options through science-based monitoring.

Table 1: Consolidated list of target species for integrated species recovery plan (primary source: NWAP 2017-2031, WII ENVIS, IUCN Red data list).

	Species	IUCN Red List Status	Current status and justification for ex-situ conservation strategy
Green Category – Common species identified by MoEFCC for which conservation breeding programs/ex situ population have been established by the CZA			
1	Asiatic Lion (<i>Panthera leo persica</i>)	EN	<ul style="list-style-type: none"> → Integrated conservation efforts have arrested the declining trends in the population which is currently limited to the Gir National Park and adjoining forested landscape in Gujarat. As the lion population is highly restricted, threat from disease and inbreeding are high. At the same time, reintroduction of wild lions from Gujarat to other states is being debated. Ex-situ measures (zoos to PAs) can support planned proposals for rewilding lions to other states. → The captive population comprises of 193 individuals set up from 40 founders and housed at 28 zoos.
2	Sangai or Brow-antlered Deer (<i>Rucervus eldii</i>)	EN	<ul style="list-style-type: none"> → Fewer than 150 individuals are estimated to be distributed in India. → Limited to only one PA (Keibul Lamjao National Park) in Manipur the deer species has shown high adaptability to swampy conditions. It is also known to breed prolifically in captive conditions. → As the wild population is highly restricted, threat from disease and inbreeding are high. At the same time, reintroduction of wild deer to its identified second home becomes logistically a challenging exercise. Ex-

			<p>situ measures (zoos to Pas) can support planned proposals for rewilding option.</p> <p>→ The captive population includes 162 individuals housed at 10 zoos in the country.</p>
3	Snow Leopard (<i>Panthera uncia</i>)	VU	<p>→ Around 3000 individuals are estimated to remain the wild. While in situ conservation efforts are intensive across the distribution range, the species is facing intense conflicts with rural communities coupled with habitat degradation and depletion of natural prey base.</p> <p>→ The captive population for the species comprises of 13 individuals from 40 founders. It provides scope for investigating how</p>
4	Vultures		<p>→ Nine Vulture species are found in India of which five are of critical conservation priority due to massive declining trends in their population. One of the pioneering concerted efforts of ex-situ and in-situ conservation measures by GOI IN 2006 (ban on the use of diclofenac, establishment of vulture breeding of 3 critically endangered species and setting up of 8 vulture breeding centers across the country, multi stakeholder partnership) can be used as a benchmark species recovery plan for other species.</p> <p>→ Conservation breeding programs for three Vulture species in ongoing resulting the establishment of these captive populations:</p> <ul style="list-style-type: none"> • White-rumped Vulture - 152 birds with 20 founders • Long-billed Vulture (Indian Vulture) - 180 birds with 33 founders • Slender-billed Vulture - 39 birds with 11 founders
5	Greater One-horned Rhine (<i>Rhinoceros unicornis</i>)	VU	<p>→ Only around 2000 individuals remain in the wild distributed in India and Nepal. The species is inherently at risk because over 70% of its population occurs at a single site, Kaziranga National Park. The species faces threats such as poaching and tensions with the surrounding high human population due to human-wildlife conflicts.</p> <p>→ The captive population as part of conservation breeding program comprises of 35 individuals from 12 founders.</p>
Orange Category – Species identified by MOEFCC for which conservation breeding programs may be considered			
6	Great Indian Bustard (<i>Ardeotis nigriceps</i>)	CR	<p>→ Fewer than 250 birds remain in the wild in small fragmented populations.</p> <p>→ An ex situ insurance population with optimal population growth can generate know how on conservation breeding and further facilitate understanding processes involved in restoring species</p>

			in managed habitats (IUCN recommended). An ex situ program in underway which is currently spearheaded by MOEFCC and WII.
7	Jerdon's Courser (<i>Rhinoptilus bitorquatus</i>)	CR	→ Fewer than 250 birds remain in the wild in small fragmented populations limited to Eastern Ghats of Andhra Pradesh and extreme southern Madhya Pradesh, India. → An insurance population of the species can be useful in understanding husbandry techniques for successfully breeding in captivity. But sourcing founder population can be a challenge.
8	Malabar large-spotted Civet (<i>Viverra civettina</i>)	CR	→ Fewer than 250 birds remain in the wild in small fragmented populations limited to Eastern Ghats of Andhra Pradesh and extreme southern Madhya Pradesh, India. → An insurance population of the species can be useful in understanding husbandry techniques for successfully breeding in captivity. But sourcing founder population can be a challenge.
9	Hangul (<i>Cervus canadensis hanglu</i>)	CR	→ Fewer than 150 birds remain in the wild with the only viable population recorded in the Greater Dachigam landscape (approximately 1,000 km ²). → A breeding centre set-up could not start because of the lack of founder individuals. However local reports suggest that rescued individuals are common, which can be planned to be included as founders for the breeding program.
10	Asian wild buffalo (<i>Bubalus bubalis</i>)	EN	→ Also included in Schedule I of the Wildlife (Protection) Act, 1972, the only viable population (more than 90%) of wild buffalo is limited to Protected areas Assam. Grassland habitats in Arunachal Pradesh, West Bengal Odisha and Chhattisgarh hold potential for rewilding options. → The species is threatened by loss of habitat and hybridization (with domesticated buffalo). Intensive planned breeding, habitat improvement in rewilding sites and post release monitoring would ensure viability in other states.
11	Nilgiri Tahr (<i>Nilgiritragus hylocrius</i>)	EN	→ Fewer than 2000 individuals distributed in the Western Ghats (less than 5% of the total area) of Kerala and Tamil Nadu.
Yellow Category – Species identified by CZA for which successful conservation breeding programs are ongoing			
12	Red Panda <i>Ailurus fulgens</i>	EN	→ The captive population comprises of 24 individuals from 6 founders.
13	Hoolock Gibbon <i>Hoolock hoolock</i>	EN	→ The captive population comprises of 48 individuals from 13 founders

	<i>Hoolock leuconedys</i>		
14	Western Tragopan Tragopan <i>melanocephalus</i>	VU	→ The captive population comprises of 45 individuals from 9 founders
15	Lion-tailed Macaque <i>Macaca silenus</i>	EN	→ The captive population comprises of 57 individuals with 15 founders
16	Indian Chevrotain <i>Moschiola indica</i>	LC	→ The captive population comprises of 264 individuals from 11 founders
17	Pig-tailed Macaque <i>Macaca leonina</i>	VU	→ The captive population comprises of 64 individuals from 21 founders
18	Phayre's Langur <i>Trachypithecus phayrei</i>	EN	→ The captive population comprises of 31 individuals from 12 founders
19	Cheer Pheasant <i>Catreus wallichii</i>	VU	→ The captive population comprises of 60 individuals from 12 founders
20	Ghariyal <i>Gavialis gangeticus</i>	CR	→ Captive population have been established and released at various locations and the project can be reviewed/ revisited under an integrated recovery plan.

Proposed components of the 5-year Integrated Action Plan (Timeline 5 years) -

- Preparation of Species Recovery Plans for all the above-listed species excluding those for which a plan exists. The plan shall include:
 - a. Road map for species recovery i.e. path and tasks required to restore and secure self-sustaining wild populations.
 - b. Site-specific management actions necessary to achieve species recovery (e.g. population census, habitat improvement, conservation breeding programs etc.)
 - c. Objective, measurable criteria which
 - d. Estimates of the time and costs required to achieve the plan's goal.
- Development of husbandry manuals for the conservation breeding, including reintroduction protocol for each of the above-listed species.
- Developing a species-specific rehabilitation protocol

Funding and implementation -

Key nodal agency for the implementation of the project will be Central Zoo Authority .

Rs. 5 Cr for each species over the 5-year plan period = **Rs. 100 cr** for 20 threatened species (detailed budget outlay will be provided following consultation with stakeholders (implementing state govt agencies, research institutions (e.g. WII , BNHS, CCMB, IVRI).

Table 1 : Proposed timeline for implementing the integrated species recovery plan .

Activities	2020-2021	2021-2022	2022-2023	2023-24	2024-2025
Consultative meeting with stakeholders for finalization of Project Plan	*				
MoU/Agreement with implementing authorities	*				
Stakeholders meeting	*	*	*	*	*
Commence work on Species recovery plan	*	*			
First draft of Species Recovery Programs		*			
Finalization of Species Recovery Programs		*	*		
Commence efforts for starting Conservation Breeding Programs			*	*	*
Experimental reintroductions				*	*
Review of the project			*		
Impact assessment of the project				*	

Proposal 2: Setting up national referral center for wildlife disease monitoring and prevention

The COVID-19 pandemic of 2020 brings us back to pause and ponder on the aspects of arresting species loss and natural habitat destruction that essentially are the root cause of the problem. As per World Health Organization website, “zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Animals thus play an essential role in maintaining zoonotic infections in nature.

Zoonoses may be bacterial, viral, or parasitic, or may involve unconventional agents. As well as being a public health problem, many of the major zoonotic diseases prevent the efficient production of food of animal origin and create obstacles to international trade in animal products “.

Zoonotic diseases, of which COVID -19 is a part, make up 60% of emerging infectious disease events worldwide, and disproportionately affect poor communities in tropical countries¹. High human density and the prevalence of biodiversity hotspots makes India particularly vulnerable to the emergence of zoonotic pathogens of wildlife origin.

Zoonotic diseases and linkages with wild animals in captivity (in zoos) for ex-situ conservation

Understanding of wildlife diseases is crucial as they impact animal species (e.g. chytridiomycosis in amphibians) and the potential of transmission to humans (e.g. anthrax, plague, brucellosis, Bovine tuberculosis, leptospirosis, salmonellosis). Of the 335 emerging disease events in humans, close to 60% were zoonotic and nearly 72% of these originated in wildlife. India is not new to zoonotic diseases and there have been localised yet grave instances of death due to such diseases (e.g. The fatal monkey fever or Kyasanur Forest Disease (KFD) was transmitted supposedly from monkeys and humans and first detected in Shimoga district of Karnataka in 1957; and the Nipah virus outbreak supposedly through bats in Kerala in 2018). The role of zoos in contributing to understanding emerging wildlife diseases and their zoonotic potential is multifold and can encompass²:

- ✓ providing healthcare of zoo wildlife, thus ensuring the sustainability of biodiversity.
- ✓ conducting studies on diseases of conservation concern.
- ✓ understanding diseases in zoo wildlife as sentinels for emerging diseases of humans and animals in urban areas.
- ✓ surveillance of disease in wild animals at the interface of wildlife, domestic animals and humans.
- ✓ contributing to the field of comparative medicine.

Current Initiative

The Central Zoo Authority has signed MoU with Indian Veterinary Research Institute, Bareilly to act as National Referral Centre to provide super specialized services and diagnostic facilities for better animal healthcare in Indian zoos. In case, zoos require specialized healthcare, the National Referral Centre has helped acilitate them with specific reference to

¹ Cox-Witton, K., Reiss, A., Woods, R., Grillo, V., Baker, R.T., Blyde, D.J., Boardman, W., Cutter, S., Lacasse, C., McCracken, H. and Pyne, M., 2014. Emerging infectious diseases in free-ranging wildlife—Australian zoo based wildlife hospitals contribute to national surveillance. PLoS One, 9(5).

² McNamara, T., 2007. The role of zoos in bio surveillance. International Zoo Yearbook, 41(1), pp.12-15.

- getting baseline data on the health parameters of various species of animals
- micro biological, bio-chemical and pathological analysis of the samples taken from live animals and histopathological and forensic examination of tissues and organs of dead animals.

Currently with nearly 160 zoos operational in the country, the burden on a single national referral centre is overwhelming. The facility at the National Referral Centre may be limiting in cases of exigencies like a disease (zoonotic or otherwise) outbreak.

Proposed Initiative

In this context, a specialized centre to serve as a stand-alone facility for monitoring disease surveillance, prevention and management is proposed. The mandate of the proposed centre will be to:

- ✓ work with governments and stakeholders to improve preparedness, understanding and management of wildlife diseases.
- ✓ establish and maintain a centralised, web-enabled close to real-time national database of wildlife health information.
- ✓ conduct diseases-based/species-based research from the perspective of emerging infectious diseases in humans.
- ✓ capacity-building of zoo veterinary staff in modern diagnostic and therapeutic methods of managing zoonotic diseases.
- ✓ act as a nodal agency for wildlife disease surveillance, prevention and management in emergent situations (e.g. disease outbreak).

Central Zoo Authority may serve as a nodal agency and facilitate the establishment of the centre to exclusively study and collaborate with agencies to study zoonotic diseases³. The implementation will be collaborative involving the current national referral centre nominated by CZA, national and international agencies (both governmental and non-governmental) involved in epidemiological and emerging wildlife and zoonotic wildlife research.

Funding requirements. Budget to prepare carry out initial stakeholder consultations, site selection and detailed DPR , **budget and functions through a NICS I empaneled vendor is proposed at 3 crores payable in the FIRST YEAR .**

Table 1 : Proposed timeline for **Establishing National centre for wildlife disease surveillance, prevention and management .**

Activities	2020-2021	2021-2022	2022-2023	2023-24	2024-2025
Consultative meeting with stakeholders for finalization of Project Plan	*				
Identification of site for the establishment of the centre	*	*			
MoU/Agreement with implementing authorities		*			

³ Fukui, D. (2014). On Zoo Grounds; Monitoring of Infectious Diseases in Wildlife for Biosecurity Countermeasure and Health Management to Zoo Animals. Japanese Journal of Zoo and Wildlife Medicine, 19(4), 105–112. doi:10.5686/jjzwm.19.105

Stakeholders meeting	*	*	*	*	*
Commence establishment of centre		*	*	*	
Launch of the centre				*	*