

**TWO DECADES
FOR
CONSERVATION & WELFARE OF
ANIMALS HOUSED IN INDIAN ZOOS**



**केन्द्रीय चिड़ियाघर प्राधिकरण
Central Zoo Authority**

(Statutory Body under the Ministry of Environment,
Forests & Climate Change Government of India)



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Authors : S.C. Sharma, S.K. Patnalk



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प्रकाश जावडेकर
Prakash Javadekar



राज्य मंत्री
सूचना एवं प्रसारण (स्वतंत्र प्रभार)
पर्यावरण वन और जलवायु परिवर्तन
(स्वतंत्र प्रभार) और
संसदीय कार्य
भारत सरकार

Minister of State
Information & Broadcasting (Independent Charge)
Environment, Forest & Climate Change
(Independent Charge) and
Parliamentary Affairs
Government of India

Foreword

Conservation of various species of wild animals and the ecosystems supporting them is now an area of global concern as it holds the key to long term survival of mankind. In a world with ever increasing demand for land for alternative uses and the available bio-resources for comfortable living, this mission can never be a ground reality unless the people at large start using the bio-resources judiciously and adopting life styles that involve minimum carbon foot-printing. Zoos, where millions of people come to have a pleasant leisure time in close proximity of various species of wild animals housed there in, are uniquely positioned to kindle that initial spark of love and empathy for wild animals motivate them to go any distance to support Governmental national movement for conservation of the invaluable biological heritage for maintaining the life supporting processes of the planet intact.

The World Zoo Conservation Strategy 1993* was the first international document which highlighted the potential of zoos as Centers of Conservation awareness. This came more or less the time that the Central Zoo Authority was launching its operations for modernizing and developing zoos of the country on a scientific lines. Taking a cue from the strategy the Central Zoo Authority has earnestly worked to provide the zoo animals a quality of life congenial to their genetic, behavioural and physical health. On the other hand it has been making serious endeavors to make the visits to the zoos more educative and rewarding by way of developing visitor friendly and nature immersing and thematic exhibits that can communicate a loud and clear conservation message to the zoo visitors. Providing appropriate security and civic amenities has also been an area of priority.

I have been given to understand that the zoos are being evaluated on all aspects of management periodically and that the findings of evaluation reveal that the performance of majority has improved consistently over last twenty years.

It is quite appropriate that the book "Two decades for conservation and welfare of animals housed at Indian Zoos" is being brought out on the eve of the Annual Conference of the World Association of Zoos and Aquarium being held at Delhi. It will facilitate the authority to get the inputs of the International Community for fine tuning the future strategy to be adopted by the authority for achieving its cherished objectives successfully. I wish that the State Governments do share the concern about making zoos a potent tool of conservation education and provide necessary infrastructural and financial inputs necessary to achieve this goal.


(Prakash Javadekar)



PREFACE

Central Zoo Authority is commonly perceived by people an organization responsible for evaluation of the functioning of zoos and closing down the ones that do not confirm to the prescribed standards and norms. However the mandate assigned to the Central Zoo authority is much bigger. The objects and reason of making the enabling provision for establishment of Central Zoo Authority in the Wild Life (Protection) Amendment Act 1991, as stated in the bill introduced in the parliament is to oversee the functioning of zoos develop zoos in a manner that these serve a useful role in conservation of various species wild animals. The mandated functions of the Central Zoo Authority to achieve the said goal are:

- (1) Specify the minimum standards and norms for housing ,upkeep and veterinary care of animals housed in zoos ,evaluate and assess the functioning of zoos with reference to these standards and norms and recognize/ derecognize zoos (keeping due regard to the interests of wildlife conservation).
- (2) To provide technical assistance and such other assistance to zoos for their proper management and development
- (3) Identification of endangered species of wild animals for purposes of planned breeding and assign responsibility of carrying planned breeding progmmes to appropriate zoos .Further to facilitate the planned breeding of identified species by way of making requisite number of founder animals through coordinated animal acquisition, exchange and loaning programmes, maintenance of stud-books and research on various aspects of planned breeding of identified species.
- (4) Identify priorities and themes with regard to display of captive animals(for creating amongst the zoo visitors an empathy for wild animals and the will to support the cause of the long tem conservation)
- (5) To upgrade the technical skills of zoo personnel to carry out the functions mentioned above through training and workshops

The mandated functions of the Central Zoo Authority reproduced above make it amply clear that main objective of establishing the authority is to ensure planned development of zoos as centers of ex-situ conservation breeding and centers for creation of conservation education. The National Zoo Policy has further assigned the zoos the role of rehabilitation centers for abandoned and disabled wild animals.

It is gratifying to put on record that the Central Zoo Authority through it's sustained efforts of more than two decades has been able change all the major zoos beyond recognition The zoos now have the technical skills and infrastructure to carry out the conservation breeding of the species allocated to them , to exhibit to the visitors physically healthy animals displaying their species specific behaviour in a nature immersing environment and their by inculcate amongst

them the empathy for wild animals and the will to support the national conservation efforts. Adequate facilities for providing the rescued animals a quality of life have also been created. Of late efforts to make zoos environmentfriendly through reuse and recycling of the solid wastes and liquid wastes have also been taken. Some of the zoos have been able to curtail their water and power consumption significantly. What is more heartening is the fact that zoos have developed healthy working partnership with the zoo enthusiasts and have become financial self sufficient through innovative marketing technology. The continued exposure of all levels of zoo personnel to latest trends in animal management, zoo exhibitory and zoo education through workshops and training programmes has proved to be quite useful in changing the working environment in zoos. The Research organizations of the country in general and the Wildlife Institute of India, Indian Veterinary Research Institute of India and the LaCONES Hyderabad have also contributed immensely in the up gradation of technical skills of the zoo personnel and policy making of the authority. The dramatic change in the zoo scenario speaks volumes about the cooperation and support of the State Governments. No words are sufficient to appreciate their contributions. How ever this is just a beginning and we have to still travel to-gather a long distance. Recognition of zoos as organizations needing lot of scientific, technical and financial inputs would be of immense help in enhancing the conservation role of zoos. The tendency of establishing zoos in every nook and corner of the state will have to be curbed and proposal to set up a new zoo must be given only after the State Government has allocated requisite staff and finances for the purpose. Availably of trained and committed zoo personnel in the existing zoos on a continued basis should be given a higher priority than establishing new zoos.

The book "Two Decades for Conservation and Welfare of Animals housed in Indian Zoos gives a precise account of sustained efforts made by the authority over the years to improve and modernize the zoos of the country. The account given in the book makes it amply clear that the authority has been receiving unqualified and whole hearted support of the chair persons of the authority and Minister of Environment of Forests and all the top level officers of the ministry. The Authority and its functionaries use this opportunity to express their heart felt gratitude to them. We are highly indebted to the international community, particularly C.B.SG, WAZA, I.S.I.S Singapore Zoo, Jersey Wildlife Preservation Trust and Rotterdam Zoo for their instantaneous support in upgrading the technical skills of the Zoo Personnel. I have no hitch in admitting that the major credit of all that we have been able to achieve on the ground goes to the members of Central Zoo Authority and members of the Expert Groups, who have been moving from zoo to zoo to ensure the implementation of the policy decisions of the authority. Zoo Outreach Organization has also been of immense help to us. I will be failing in my duty if I do not pay homage to late Sri Pushp Kumar who had dedicated his entire life for improving the functioning of zoos in this country.



B.S. Bonal
Member Secretary
Central Zoo Authority

ACKNOWLEDGEMENT

The Central Zoo Authority of India is recognized both nationally and internationally as an eminent institution that has made outstanding contribution towards modernizing all major zoos of the country. The authority was established as a very miniscule organization, with hardly any supporters both within the Government and outside the Government. The authority could not have achieved the present status but for the whole hearted support and the firm commitment of Chairpersons & the Minister of Environment and Forests Government of India and the Secretary Environment of Forests, Government of India and other members of the authority all these years. They deserve all praise and appreciation for their farsightedness and clarity of Vision. The authority has been extremely fortunate to have Member Secretaries totally committed to the cause of conservation. This has helped in maintaining the continuity of policies and streamlining the process of development of zoos. We are proud of the contribution made by them.

The book "Two Decades for Conservation and Welfare of Animals at Indian Zoos" gives an event by event account of the progress made by the authority in developing self-sustaining population of various species of wild animals housed at Indian Zoos and providing them a quality of life that helps them to keep their species specific behaviour. Perusal of the book will reveal that the journey has been quite tough. The authority has been able to make it with the technical inputs of experts in all fields related to the zoo management. The names that need special mention in this regard are Late Dr. Ullis Seal, MS Sally Walker, Late Sri Pushp Kumar, Dr Jacob Cheeran, Dr L.N. Acharjyo, Dr B.M. Arora, Dr Rahul Kaul, Dr Lalji Singh, Dr S. Shivaji and Dr J.H. Desai. Durrel Academy, Wildlife Institute of India, Indian Veterinary Research Institute, Madras Veterinary College, Veterinary College Anand, Veterinary College Khanpara and Orissa Utkal Agriculture University and the School of Planning and Architecture have also been of immense help. The zoo community will remain ever grateful to all of them.

Writing of this book has been like reliving every event related to decision making in the authority and enforcement of these events on the ground and made us feel as if we have grown younger again. We are extremely grateful to Sri B.S. Bonal Member Secretary, CZA for giving this pleasure to us by assigning the work of writing this book. We are also grateful to Sri Inder Dhamija, D.I.G. Forster, Dr Brij Kishor Gupta, Dr Devendra Kumar and Sri Ajai Kumar for all the help given by them in making the publication of the book possible. We also thank Sri Jha and Gopal for the help rendered by them.

S.C. Sharma
S.K. Patnaik

INTRODUCTION

As ecosystems become more impoverished and species of animal that are part of them become more endangered, pressure mounts on zoos to develop as centres of excellence in ex-situ breeding of endangered species of wild animals and to impart conservation education to augment the depleting in-situ populations and muster mass support for protecting these populations effectively. Large numbers of zoos in the Western world have been able to rise to the required expectations and are making significant contribution to the cause of the conservation of wildlife. However, the majority of zoos across the world, including some of those in India have not been able to come out of the entrenched perception of zoos as curiosity parks. The emphasis of the zoo management still continues to be on having in their collection as many species of wild animals as possible especially of the exotic species, worrying little about the conservation and the welfare needs of the species displayed by the zoo. Scientific and technical inputs and finances for efficient functioning of zoos are rarely available. The problem is further compounded by the fact that zoos had been taken very casually by the higher authorities, both in the government sector and in the corporate sector and they have established new zoos to impress and please the local people without provision of adequate planning and financial inputs. The Government of India has been making sincere endeavours to convince the zoo operators and the zoo managers about the conservation role of zoos ever since it took over the reins of the country. However all the persuasive steps including the transfer of technical knowhow and grant of financial assistance have failed to yield the desired results. Realizing that nothing short of legally enforceable rules and regulations can improve the lot of zoos in the country, Government of India constituted an autonomous and duly empowered authority i.e. the Central Zoo Authority to oversee and regulate the management of zoos in the country in , through an act of Parliament in 1992. The Central Zoos Authority has not only closed down more than 200 sub-standard and cramped zoos but has also rendered made significant service in upgrading the zoos that had the potential to improve both by through financial assistance for improvement of infrastructure and through building up the capacity of zoo personnel for carrying out planned ex-situ conservation of various species of wildlife and maintaining the highest standards of animal welfare for the species housed in the zoos. It is high time that zoos pull up their socks and participated actively in the National Wildlife Conservation Programme.

EVOLUTION OF PUBLIC ZOOS

Wild animals have been kept and maintained in captivity as objects of curiosity and status symbols since time immemorial in menageries often forming part of royal places. London Zoological Society established the first menagerie dedicated to scientific and taxonomic studies on the wild animals from different parts of the globe in 1827 at Regent Park London. The opening of the gates of this menagerie to the people of London by the British Government was a great event. The venture gained immense popularity amongst the city dwellers of London as it not only provided them the opportunity to spend their leisure time in picturesque settings, but also satisfy their curiosity to view rare and unique animals from different parts of the globe.



Enthused by the astounding success of this first public zoo of the world, the governments of a large number of countries were motivated to establish public zoos in their major cities. of course, India, which was under British rule, had established a menagerie in Barrackpore near Calcutta in 1803 as a part of the Indian Natural History Project which survived till 1875. After this public zoos in the country were established at Madras, Bombay, Calcutta and Nagpur in 1855, 1863, 1875 and 1905 respectively. Most of the princely states also followed suit and established public zoos in their own States. The list of the zoos so established comprises those at Trivandrum (1857), Junagarh (1863), Jaipur (1875), Hyderabad (1877), Baroda (1879), Trichur (1885), Mysore(1892), Kota (1905), Gwalior (1921), Udaipur (1935), Bikaner and Jodhpur (1936). The *Jagirdars* of Awadh established a zoo at Lucknow to commemorate the visit of Prince of Wales to the United Provinces in 1921. By this time the menagerie at Marble Palace at Calcutta established by Raja Rajendra Mullick Bahadur in 1854 had also been opened to the public. In

addition to above zoos, four deer parks namely Lalbagh (Bangalore), Shiv Ganga (Thanjavur), Bellilus Deer Park and Corporation Deer Park (Howrah) were also established in the interim period. Thus by the year 1936, 18 zoos and four deer parks were operating in the country,



Marble Palace Zoo, Kolkata

No zoo was established in India between the year 1936 and 1950. Generally it is believed that the main reason for this lull was the fact there was turbulence everywhere in the country which including the Second World War and the struggle for independence, besides the post-independence turmoil. However the knowledgeable sources reveal that this was the period when the concerns about a sharp decline in the in-situ populations of various species of wild animals were high on the government agenda. Lord Wellington organized a conference in Delhi in 1935 to address these concerns. As an outcome of this, the All India Conference for Conservation of Wildlife was formed. The conference had most of the eminent wild lifers of the country and was instrumental in notifying important wildlife habitats as national parks and wildlife sanctuaries as well as enforcing of game hunting rules and regulations in several states. Some of the members were quite critical about the living conditions of the animals housed in the zoos. These views did help create awareness for initiatives to be taken by the government of independent India particularly in establishing the Indian Board for Wildlife soon after the dawn of Indian Independence.

The zoo movement in British India will always be remembered for the sincerity and the of the zoo operators and the zoo directors .So much care has been taken in selection of the zoo site that, even after a lapse of hundred years, 9 zoos still continue to operate and develop at the original site .The zoo directors, despite the absence of any scientific support staff kept very meticulous record of the biology, behaviour ,breeding and health care of the animals under their charge. In this regard the contribution made of Sri Ram Brahm Sanyal, Curator of Alipore zoo has been

globally recognized because of his book "A Hand Book on Management of Animals in Captivity in Lower Bengal(1892), which happens to be the first manual on management of zoo animals in the world.

INDIAN BOARD FOR WILD LIFE AND THE INITIATIVES FOR IMPROVEMENT OF THE ZOOS OF THE COUNTRY:

The Indian Board for Wildlife at its very first meeting held at Delhi in 1952 passed a resolution for establishing a modern zoo in Delhi. The state governments were also requested to take up initiatives to set up naturalistic zoos to showcase the rich biodiversity of the country. The Government of India in compliance with the aforesaid resolution, constituted a committee comprising of Smt. Indira Gandhi, E.M. Bowring Welsh (Royal Society of Prevention for Cruelty to Animals) and the Chief Commissioner of Delhi and for identifying a suitable site for the zoo at Delhi. The committee gave its report on 9th February 1953 suggesting the land near the old fort for construction of the zoo. The report was accepted by the government and the services of Karl Hegenbeck, Director of Hamburg Zoo, Germany, the originator of the concept of open zoos, were hired for preparing a conceptual plan of the zoo. The plan prepared by Hegenbeck was approved by the government with modifications to suit the local conditions.

The construction work of the zoo was started in 1954 and was completed by the year 1959 & was opened to the public. Following the initiative taken by the Government of India, the States of Andhra Pradesh, Orissa and Assam also started construction of large and naturalistic zoos at Hyderabad, Bhubaneswar and Guwahati respectively. These zoos also became operational by the year 1959/60. Hyderabad zoo, the layout and the enclosure designs which were finalized by Shri Pushp Kumar has been acclaimed to be as among the most naturalistic zoo by the zoo experts from across the globe. A specialized zoo for high altitude fauna was also established at Darjeeling with the collaborative efforts of the Governments of India and West Bengal during the same period and was made operational from 1958.



Maoted Enclosure at Nehru Zoological Park, Hyderabad

Realizing that the setting up a few modern zoos alone may not be sufficient to improve the quality of life of the animals in the zoos that were already operating, a meeting of the superintendents of all the zoos was convened in Madras in 1955 to identify the problems being faced by the zoos and to finalize a strategy to redress them as well as to enhance their value for public education and ex-situ conservation of wildlife. The conference passed very pertinent resolutions including some relating to the improvement of animal housing, improving animal health and exchange of animals. The meeting being quite concerned about the fast decline of the in-situ populations of different species of wild animals, the participants proposed that ex-situ breeding of selected species of wild animals should be taken up for their rehabilitating in to denuded forest areas, with sparse populations. The meeting came up with proposal that an association of zoo superintendents be formed for facilitating better coordination between the zoos. The executive committee of the board met a few weeks later, discussed the recommendations of the meeting and endorsed them for compliance.

The Government of India with a view to monitoring the affairs of the zoos in the country on a regular basis created the Zoo Wing of the board in 1956. The first meeting of this wing was held at Dehradun on 16th May 1956 at which recommendations about the size of animal enclosures, meeting the behavioural requirements of animals of different species and the measures essential for prevention of inbreeding in the zoo animals were made. A procedure for obtaining mates for single animals was also suggested. The recommendations were duly accepted by the Government of India and the State Governments were requested to ensure compliance with these recommendations. Although no concrete information is available about the action taken by the zoo operators to improve the quality of life of the animals housed in the zoos, the records available at various zoos do reveal that some zoos did take concrete measures to increase the area of the zoos and upgrade the housing and upkeep of the zoo animals. The Zoo Wing of the Board endeavored hard to improve the zoos till 1973 and was instrumental in establishing some well-designed zoos in the country. The Vishakhapatnam Zoo needs a special mention in this regard. Area-wise it is one of the largest zoos of the country and extends over an area of more than 400 hectares.

ESTABLISHMENT OF ZOOS : FREE-FOR-ALL

Till the dawn of India's freedom, maintaining wild animals in captivity had been the sole prerogative of the British rulers and the ruling princes. Hence there was lot of glamour attached to owning of a zoo. It was therefore quite natural for various Government departments and the influential and rich persons and organizations to think of having a zoo of their own. There were no laws or rules in place at that point of time in the country that placed any restrictions to the capture/acquisition of wild animals for establishing a zoo. Therefore different government departments, municipal corporations and public sector undertakings started establishing zoos and deer parks in different parts of the country. Private organizations and some well to do individuals also joined the club. Some entrepreneurs, taking advantage of the inherent desire of the people living in the far-flung areas to see the large carnivores established the touring zoos. They maintained the large carnivores in cramped cages and transported them from village to village for display in village fairs. The following is the list of the zoos established between the years 1951 to 1973 is as follows:

Period	Number of zoos established by different departments of the government						
	Forest	Irrigation	Horticulture	Municipal corporations	Public sector undertakings	Total	
1950-60	9	1	1	4	1	16	
1961-70	11	1	1	1	-	14	
1971-73	15	-	-	-	1	16	
Total	35	2	2	5	2	46	
Number of Zoos established in Private Sector							
Period	Touring Zoos	Private Persons	Religious Institutions	Educational Institutions	Industrial units and trusts	Department of Museum	Total
1951-60	4	1	1	1	1	1	9
1961-70	8	2	1	1	1	-	13
1971-73	1	-	-	-	1	-	2
Total	13	3	2	2	3	1	24

Thus by the year 1973, seventy new zoos had been established as against 22 zoos established in the pre-Independence era. Of these 70 Zoos only eight zoos namely Delhi Zoo, Nehru Zoological Park, Nandankanan Zoo, Assam State Zoo, (Guwahati), Kamla Nehru Zoo, (Ahmedabad), Indira Gandhi Zoo, (Vishakhapatnam), Padmaja Naidu Zoo, (Darjeeling), Kanpur Zoo (Kanpur) and Sanjay Gandhi Zoo, (Patna) were planned and laid out well. Of the private zoos Madras Snake Park and Deepak Mitra Snake Park were run by professionally competent persons. The rest were cramped and dingy zoos, managed in a very casual and nonprofessional manner.

APPOINTMENT OF THE EXPERT COMMITTEE

The year 1972 was a watershed in the history of zoo management at the global level. It was the year in which the International Union of Zoo Educators was formed. That year the First World Conference on Breeding of Endangered Species was held at Jersey Wildlife Preservation Trust, U.K. It was during this year that the process of transition of zoos from curiosity parks to centers of conservation began. Spurred by these global developments and being concerned about the rapid growth of unplanned and ill-conceived zoos in the country, the Indian Board for Wildlife in its ninth meeting held in November 1972 recommended that an expert committee be constituted to evaluate the current status of zoos in the country and suggest measures for their planned development. Accordingly the Government of India constituted an expert committee under the Chairmanship of Dr. A. P. Kapoor, Director, Zoological Survey of India and four eminent zoo directors namely Shri N. D. Bachketi, Shri Pushp Kumar, Dr. K. Parmeshwar Pillai and Shri N. S. Adhkoli as members to study the present status of all the zoos of the country and formulate norms on the basis of which they could be classified in to different categories. The committee was also required to

1. Study various zoos in the country and formulate norms on the basis of which these can be classified in to different categories,

2. Suggest administrative pattern for various categories of zoos,
3. Formulate minimum standards for maintenance of health and hygiene in the zoos,
4. Make suggestions for successful breeding of the zoo animals and their rearing including exchange of animals between the Indian Zoos and the zoos abroad
5. Other procedural matters pertaining to management of Zoos.

The committee after detailed deliberations with zoo directors and other zoo enthusiasts in the country: visiting the important zoos of the country and using the information available with members in their individual capacities submitted a very detailed report on management strategies to be followed for planned development and the day-to-day operation of the zoos. The recommendations made by the committee were accepted by the Government and sent to all concerned for compliance. Most of the recommendations appear to be quite pertinent even today. The important ones were the appointment of a full-time director for each zoo, one curator each for the reptile, mammal and bird sections; two veterinarians for large zoos and one veterinarian for small zoos; provision of appropriate housing facilities for the species housed by the zoo; making available an appropriately equipped veterinary hospital and other allied facilities and recruiting adequately trained staff members. The committee also suggested that the minimum area of 'A' category zoos and that of 'B' and 'C' category zoos should not be less than 50 hectares and 25 hectares, respectively. The committee went even to the extent to suggest that small zoos with no scope for improvement should either be closed or amalgamated with larger zoos. The committee was of the firm view that there was no scope for having privately owned zoos in the country. All these good recommendations made by the committee could have proved to be a major step forward in the direction of modernization of Indian zoos, if adequate follow up measures would had been taken to ensure that State Governments and other zoo operators in the country complied with them. It was a sad paradox that but for the establishment of large and naturalistic enclosures in some zoos by few states, no significant progress was achieved in implementing the recommendations of the committee. The existing major zoos however followed, the recommendations of the committee to upgrade the maintenance of records and day-to-day operation of the zoos by adopting the forms designed by the committee.

It would also not be out of place to mention that the committee could not muster courage to emphasize the point that the future of zoos lies in evolving themselves as conservation centres and that the tradition of establishing new mini zoos and Deer Parks by anybody and everybody and treating the zoos as curiosity parks and recreation centres must end. The two recommendations of the committee; that zoos should endeavour to display as many species of indigenous and exotic animals as possible and that the local and limited interests can be fulfilled by creation of deer parks, safaris, pet corners and children's corners which were classified as 'D' category zoos (the committee did not suggest any minimum area for 'D' category zoos) proved to be biggest short coming of the report.

Note: The committee in its report estimated the number of existing zoos in the country at the time of finalization of its report as 47 only. However from the details given in the foregoing paragraphs it will be amply clear that the total number of captive wild animal facilities in the country was well above 90 at that point of time. This includes all the captive animal maintaining facilities, including

touring zoos and the animal facilities owned by the private individuals, trusts, corporate bodies and small non- governmental organizations.

ERA OF MUSHROOMING OF CRAMPED AND UNPLANNED ZOOS

It was expected that "the Expert Committee Report" would convince the forest departments and municipal corporation officials to change their casual approach to matters relating to establishment of new zoos and to concentrate on improving and upgrading of the existing zoos. It was a sad paradox that nothing of that sort happened. On the contrary, establishment of new Mini Zoos and Deer Parks continued at a much faster pace. The main causative factors for this uncontrolled mushrooming were the beginning of the Social Forestry Programme, the launch of an F.A.O. project for conservation of three crocodilian species, the coming up of major industrial projects and increased budget allocations to municipal bodies and other government departments. The worst offenders were the state forest departments. So far they were working within the limits of notified forests only. They were now required to carry out afforestation work within areas forming part of various cities, towns and villages. To ensure their acceptability and make their presence felt, they resorted to the creation of city parks, with deer parks being components usually. The problem was further accentuated by internationally funded projects in social forestry programmes. Most of these projects had an essential provision of 'District Forest Awareness' provision with a deer park as the main component. Some well laid-out and naturalistic zoos were also established during the period between 1973 and 1992 by both forest departments and the public sector undertakings. The following table gives the breakup of zoos established from 1974 to 1983 and 1984 to 1992 by different organizations:

a) Zoos Established In the Government/Public Sector

Period	Number of zoos established by various departments					Total
	Forest	Municipal corporation	Defence	public sector undertaking	Others	
1974-83	78	12		1	2	93
1984 -92	73	6	4	4	1	88
Total	151	18	4	5	3	181

Other Departments include I.V.R.I -1, Tribal Department -1 and Tourism -1

b) Zoos Established in the Private Sector

Period	Name of the agencies					Total
	Touring zoos	Corporate sector	Trusts	Private Individuals	Others	
1974-83	5	3	2	6	5	21
1984-92	5	4	---	6	--	15
Total	10	7	2	12	5	36

Although the zoos mentioned in the foregoing were primarily Mini Zoos, Deer Parks, Snake Parks, Crocodile Breeding Centres and Touring Zoos, some large and naturalistic zoos were

also established between 1973 and 1992. These are (1) Matri Baug Zoo Bhilai (1975)-60 Hectare, (2) M. C. Zoological Park (1977)-202 Hectare, (3) Aizawl Zoo (1977)-66 Hectare (subsequently shifted to a new site outside the city), (4) Biological Park Itanagar (1978)-60 Hectare, (5) Van Vihar Bhopal(1983)-445 Hectare, (6) Arignar Anna Zoo (1985)-602 Hectare, (7) Sri Venkateswara Zoological Park, Tirupati (1987)-480 Hectare, (8) Jawaharlal Nehru Biological Park, Bokaro (1987)-51 hectare, (9) Madras Crocodile Bank, Chennai (1976)-3.2 Hectares & (10) Tiger Safari, Shimoga (1988)-250 Hectare.

EFFORTS TO UPGRADE SCIENTIFIC, TECHNICAL AND PLANNING INPUTS

While on the one hand the period of 1974-1992 will be remembered for mushrooming of ill-planned and cramped zoos, it will also be remembered for the scientific, technical and planning inputs provided by the Central Government for building the capacity of the zoo personnel in the country. In the 1970s under the FAO project, "Crocodile Conservation & Research Center" was established which helped in develop Crocodile Breeding Centres in various states and thousands of Gharial, Muggar and estuarine Crocodile hatchlings were raised in the country and successfully reintroduced in various suitable rivers and water bodies of the country. Under this programme, Gharials were bred for the first time ever in captivity at Nandankanan Biological Park in 1980, through a breeding male received from Germany on a breeding loan. An agreement was also signed between the German Democratic Republic (G.D.R.) and Government of India for exchange of zoo personnel under which zoo directors from India visited major zoos in G.D.R. The zoo personnel from that country also visited Indian zoos for many years. Towards the late 1970s, The "All India Training Course for Zoo Veterinarians on Capture Techniques for Zoo Animals" was conducted. This came out to be quite helpful in improving the treatment and transportation of zoo animals. In October, 1982 a meeting of the WORLD PHEASANT ASSOCIATION was held at Srinagar. As an out-come of the conference, collaborative breeding programmes for various species were started-at Kohima, Nagaland for Blyth's Tragopan and at Manali and Sarahan Himachal Pradesh for the Monal and Western Tragopan. After the formation of a separate Ministry of Environment and Forests in 1982, wildlife started getting a higher priority on the agenda of the Government of India and in 1985 the National Wildlife Action Plan was adopted. The plan duly recognized the role of zoos in the National Wildlife Conservation Movement. In 1986 the Wildlife Institute of India was established at Dehradun for the dual objective of carrying out research and training in issues related to wildlife management in the country. The allocations of the wildlife sector were increased substantially for the Seventh Five-Year Plan (1987-1992) and two new centrally sponsored schemes namely Assistance for Development of Selected Zoos and Assistance for Planned Breeding of Endangered Species of Wild Animals were launched under the plan. A team of experts sponsored by the U.S. Fish and Wildlife Service visited India to evaluate major zoos and national parks and make recommendations for enhancing their educational role. In keeping with the recommendations, the Centre for Environmental Education, Ahmadabad upgraded the educational signage at the National Zoo. In 1988 zoo experts from the U.S.A. and Britain were invited to participate at meeting of zoo experts at Delhi to finalize the concept of the master plan of the National Zoo. A three year zoo consultancy project was awarded to the Wildlife Institute of India in 1988 in collaboration with all the zoos of the country. After the conclusion of the project

the institute gave a detailed report on:

- (1) minimum standards for housing and up keep of zoo animals,
- (2) standards for health care of zoo animals,
- (3) a strategy for breeding of endangered species of wild animals,
- (4) interpretational and educational programmes in zoos,
- (5) training needs of zoo personnel,
- (6) research needs of zoo management and,
- (7) the need for a zoo cell at the institute.

In pursuance of the recommendations made in the Project Report a two week capsule- course was started from the year 1992.



1st Training Programme for Zoo Directors

With the idea of ensuring a better coordination between the idea of having an Association of Zoo Directors of the Country in 1985. After due deliberations between the Zoo Directors of the Country extending over several annual meetings, the constitution of the association was finalized in 1988 at Junagarh. The association was finally registered in 1991 at Bhubaneswar with the Director Nandankanan Zoo as its first President and the Director, National Zoological Park, Delhi as its permanent Secretary.

For the various reasons already given in the forgoing paragraphs and in particular the varied ownership pattern of zoos, the lukewarm attitude of the Government towards zoos, the frequent changes of the director and supervisor- level officials and the reluctance of the zoo management to ex-situ conservation of various species of wild animals; all the initiatives taken by the central government failed to yield the desired results. It was amply clear by now that nothing short of bringing the zoos under the supervision and control of a statutory authority could ensure the

desired quality of up keep, health care and successful breeding of zoo animals.



Participants at IVth All-India Zoo Directors Conference, Trivandrum June 24, 1988

SETTING UP OF THE CENTRAL ZOO AUTHORITY

The Central Government made a provision for setting up the Central Zoo Authority to oversee and regulate the management of all the zoos of India through an amendment of the Wildlife (Protection) Act, 1972 in 1991. A provision was made in the act to the effect that no zoo in the country can operate without getting recognition from the Central Zoo Authority. It is also provided in the act that recognition to any zoo will be granted by the Central Zoo Authority having due regard to the interests of conservation of wildlife and the norms and standards prescribed in this regard. The mandatory functions assigned to the Central Zoo Authority under the act are:

- a) to specify minimum standards for housing, upkeep and veterinary care of the animals kept in the zoos,
- b) to evaluate and assess the functioning of zoos with respect to standards and norms prescribed,
- c) to recognize and derecognize zoos,
- d) To identify endangered species of wild animals for purposes of captive breeding and assigning the responsibility in this regard to a zoo,
- e) to coordinate the acquisition through exchange and loaning of animals for breeding purposes,
- f) to ensure maintenance of studbooks of endangered species of wild animals bred in captivity,
- g) to identify the priority and themes with regard to display of captive animals in a zoo,
- h) to coordinate training of zoo personnel in India and abroad,

- l) to coordinate research in captive breeding and educational programmes for the purposes of zoos,
- j) to provide technical and other assistance to the zoos for their proper management,
- k) to perform such other functions as may be necessary to carry out the purposes of this act with regard to zoos.

After the passage of the Wildlife (Protection) Amendment Act 1991, the Government of India issued a formal notification bringing in to effect the provisions relevant to the constitution and functioning of the Central Zoo Authority in to effect on 1st, February 1992. On the same date a notification constituting the Central Zoo Authority, under the Chairmanship of the Minister of Environment & Forests, was also issued.



Member of Authority (1992)

PREPARATORY PHASE

After coming in to existence the Central Zoo Authority, straight way took up the task of drafting the minimum standards for housing, upkeep and providing the health care for zoo animals and other issues related to zoo management ,which can provide transparent and justifiable criteria either for granting recognition or refusing to grant of recognition to a zoo. Advantage of Britain's Zoo Licensing Act1981, recommendations of the Zoo Expert Committee and the guidelines prepared by the Wildlife Institute of India under the Zoo Consultancy Project and the views of the zoo experts across the country were taken in to consideration when drafting the minimum standards and norms. Due precautions were taken by the members to ensure that the standards and norms adopted were not too idealistic. Every effort was made to see that these are quite practical and implementable and would lead to an improved quality of life for the zoo animals. The comments of

the zoo directors of all the zoos and the Chief Wildlife Wardens of the states were also obtained and the views expressed by them were duly accommodated for ensuring greater acceptability of the adopted standards and norms. The standards and norms so finalized by the Central Zoo Authority were notified as the Recognition of Zoo Rules, 1992 on 4th August 1992.

A REGULATOR - THAT REQUIRES TO BE A FACILITATOR

The chairperson of the Central Zoo Authority and the Minister, Environments and Forests at very first meeting of the Central Zoo Authority, cautioned the members that, although the statutes of the act assigns Central Zoo Authority the role of a regulator, granting of recognition to zoos and refusing to grant of recognition alone would not be sufficient to achieve the objectives for which the Central Zoo Authority had been set up. The success of the Central Zoo Authority in fulfilling the role assigned to it would depend upon its capacity to convince the zoo directors and the zoo operators that the Central Zoo Authority functions primarily to facilitate and assist zoos in planned development into eminent institutions working in the field of ex-situ conservation of wildlife and animal welfare. This would be possible only through the active participation and cooperation of the people working in the field in both the disciplines. It was with this in view that the President, Zoo Directors Association and the Chairperson Animal Welfare Board of India were made permanent invitees to the meetings of the Central Zoo Authority. further, one animal welfare enthusiast was always nominated as a member of the Central Zoo Authority. The logo adopted by the Central Zoo Authority very aptly symbolizes the need for working in tandem with all the stake holders in the development of the zoos in India.

JOURNEY STARTS FROM A SCRATCH:

Most of the state governments and other agencies operating zoos, initially, were not very happy about the creation of the Central Zoo Authority. They felt it was an unnecessary intervention by the Central Government in their autonomy in establishing and operating the zoos, a function that they had been carrying on out for decades quite successfully. The biggest challenge before the Central Zoo Authority was to get the acceptability at the field level. The task could have been achieved easily if the Central Zoo Authority had abundant funds for releasing grants to all the zoos according to their demands. However the Central Zoo Authority had neither the finances nor the infrastructure to fit into the role expected by the state governments and other zoo operators. The Central Zoo Authority could tide over this lean period only through the personal interest and support of the Minister of Environment and Forests and the Secretary Environment and Forests. This not only brought the state governments and other zoo operators in line but also provided some funds to the Central Zoo Authority though re-appropriation from the existing schemes of the ministry for carrying out its functions and releasing some financial grants to the zoos. The regular Member Secretary was yet to be appointed and the evaluation process of zoos could start only after the receipt of applications for recognition from the zoos and that too would take substantial lot of time. The Central Zoo Authority made a beginning in making its presence felt by releasing token financial grants to zoos according to the assessment of needs by the members to as many viable zoos as possible. The details of the financial grants so released to zoos are as follows (all amounts are in lakhs of rupees):

Year	Animal enclosures	Veterinary facilities	Store and kitchen	Water supply	Sanitation and hygiene	Boundary wall	Road and path	Education	Miscellaneous	Total (Rs. in lakhs)
1991-92	26.92	4	1.6	9	2.72	6.08	0.08	1	2	53.4
1992-93	24.85	9.26	5.93	14.6	3.87	8.85	1.5	2.7	1.29	72.85
1993-94	44.03	22.89	10.45	27.15	7.15	30.42		2.93	0.67	145.69
Total	95.8	36.15	17.98	50.75	13.74	45.35	1.58	6.63	3.96	271.94

The Central Zoo Authority also started taking initiatives to upgrade the technical skills of the zoo directors/veterinarians/supervisors simultaneously. Shri K.N. Banarjee, Curator, Nehru Zoo Hyderabad, Smt. Rajashree Sharma, Education Officer, Assam State Zoo Guwahati and Shri Manoj Kumar Mishra were sent for a 3 week training course on conservation of endangered species at Jersey Wildlife Preservation Trust U.K. in 1993. Shri N.C. Bahuguna, Director, Padmaja Naidu Zoological Park attended the same course in 1994. Twenty-four zoo directors were provided an intensive 2 week training course at National Zoo, Delhi and M.C Zoological Park, Chhatbir by the faculty of the Wildlife Institute of India. The Central Zoo Authority organized PHVA workshops for the Asiatic Lion and the Lion-tailed Macaque at Vadodara and Chennai respectively with the courtesy of the Captive Breeding Specialist Group under the expert guidance of Dr. Ulysis Seal, Chairmen, CBSG. The workshops proved to be of great use in sensitizing the zoo directors to for meeting the biological, behavioural and genetic requirements of various species of zoo animals for conserving them ex-situ effectively.

NOTIFICATION APPRAISING THE ZOOS TO MAKE APPLICATION FOR RECOGNITION WITH IN PERIOD PRESCRIBED BY THE ACT AND SCREENING OF THE APPLICATIONS RECEIVED:

Consequent to the Recognition of Zoo Rules 1992, the Central Zoo Authority issued a notification to the effect that no zoo can operate in the country without getting recognition of the Central Zoo Authority except for the zoos which are already operational on the date of the issue of the notification. It was also notified that it was mandatory for the zoos that are already operating in the country to make an application for recognition to the Central Zoo Authority in the prescribed format and with the prescribed fees positively before 31-8-1993. Those who fail to do so would not be entitled to operate as a zoo after 31-8-1993. Wide publicity of these facts was also made through the print media. In response to the notification 497 applications were received for grant of recognition as zoos. After preliminary scrutiny only 326 applications were found eligible for consideration. Brief details of the zoos whose applications were found eligible for consideration is given under:

Period of establishment	Number of zoos(area category wise)					Total
	50 hect. or more	20.1 -50hect.	10.1 -20hect.	5.1 -10hec	5 hect or less	
Prior to 1950	-	2	3	7	10	22
1950-1960	4	1	3	2	9	19
1961 -70	1	2	2	2	13	20
1971-1980	10	3	8	12	47	80
1981 -90	3	6	18	26	119	172
1991-93	-	-	1	-	12	13
Total	18	14	35	49	210	326

*Besides there were 22 touring zoos

EVALUATION OF THE ZOOS AND ENFORCEMENT OF THE PRESCRIBED STANDARDS AND NORMS:

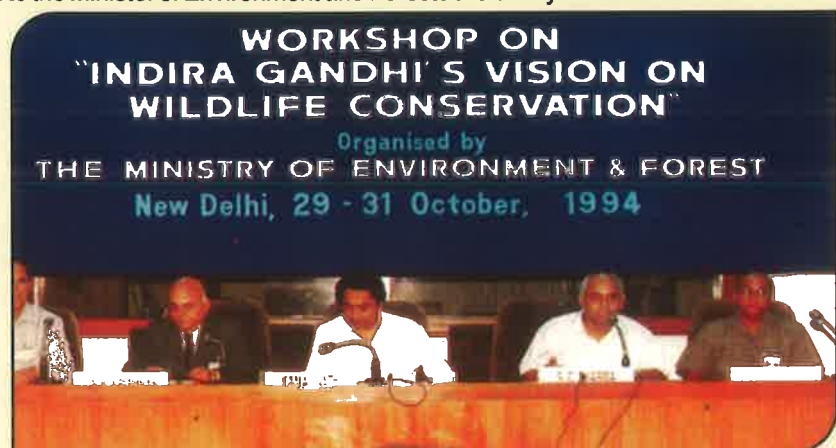
The categorization of the zoos eligible to consideration for grant of recognition by the Central Zoo Authority into large, medium, small and mini zoos as according to the norms prescribed by the Recognition of Zoo Rules, 1992 was done in September 1993 by a committee under the chairmanship of Late Shri Pushp Kumar. Fifteen, 17 and 32 zoos qualified as large, medium and small zoos respectively. Since large zoos were quite important from the point of view of the size of their collection and the number of visitors, evaluation of large zoos was taken up on a priority basis. All the large zoos had been evaluated by the team comprising of zoo experts eminent veterinarians and conservation educationists by the end of 1994. The evaluation of these zoos clearly revealed serious inadequacies in the animal housing, upkeep and healthcare facilities available at the zoos. Even the best managed zoos of the country did not confirm to all the standards and norms prescribed in the rules. The inadequacies ranged from sub-standard housing facilities to and, absence of veterinary facilities and animal upkeep infrastructure for upkeep, of animals an inadequate water supply, non- existence of security walls, a lack of civic facilities for visitors and so on. The main emphasis of zoo management was on entertainment while conservation education and scientific population management were of rather low priority. The ground situation clearly revealed that refusing recognition to the zoos on the basis of their not confirming to the prescribed standards would not work. It would defeat the very purpose of creation of the Central Zoo Authority. Under the circumstances it was decided to grant recognition to all zoos that had the potential to come up to the prescribed standards within a reasonable period of time. It was also decided that recognition should be refused only to such zoos which could not come-up to the prescribed standards due to paucity of land. However there would be no hitch regarding giving any sub-standard zoo time to shift to an alternative site where adequate land was available for developing a good zoo conforming to the prescribed standards. It was also felt that the state governments, who were mostly facing a severe financial crunch, would not be in a position to find financial resources to bring the zoos operated by them up to the prescribed standards. Taking into consideration the importance of the zoos in supporting a national cause of creation of conservation awareness, it was felt that the central government in all fairness should provide reasonable financial support to the state governments for

improvement of zoos. In view of these circumstances the central government launched the Central Sector Scheme for Grant-in-Aid to the Central Zoo Authority with a total outlay of Rs. 12 crores in January 1995.



ROAD MAP FOR PLANNED DEVELOPMENT OF ZOOS:

The late Smt Indira Gandhi had always been quite appreciative of the conservation role of the zoo. The National Wildlife Policy duly acknowledged the conservation role of zoos. A 3 day workshop entitled "Indira Gandhi's Vision-Scientific Management of Zoos as an Instrument for Conservation of Wildlife" was organized at Vigyan Bhavan, Delhi from 29 to 31 October 1994 to work out a strategy to make her vision reality. The workshop was attended by zoo directors, eminent zoo experts, non-governmental organizations involved in zoo education and scientists working in the field of animal health assisted reproduction and DNA finger printing. The deliberations at the workshop and the conclusions arrived at and presented in the concluding session to the Minister of Environment and Forests are briefly summarized here:



1. Zoos must make concerted efforts to provide all the animals housed at the zoo adequate space and congenial living conditions, even if this leads to a reduction in the number of species housed at the zoo.
2. No zoo should house in any animal enclosure more animals than the optimum carrying capacity of the enclosure. To ensure this, the zoos shall take appropriate population control measures.
3. Every zoo should have proper food storage facilities and a suitably designed Kitchen to prepare and provide adequate and wholesome food to the animals in a hygienic manner.
4. Zoo animals should be regularly screened for pathogenic loads. The animals found positive for pathogenic loads should be provided appropriate prophylactic treatment to make them free of pathogenic loads. Any animal that falls sick should be provided diagnosis based treatment. A database of the diseases diagnosed and the treatment provided to zoo animals should be maintained in a meticulous manner.
5. Zoo veterinarians should endeavour to upgrade their clinical skills keeping constantly in touch with veterinary colleges and research centres
6. Every zoo should have an education unit manned by qualified personnel. Help may also be obtained from voluntary organizations may wherever it is available. Zoo guides should be selected on a voluntary basis and trained appropriately to conduct visitors inside the zoo.
7. Zoos must strive to breed indigenous endangered species for creating a gene pool of genetically, behaviourally and biologically healthy animals for exhibition purposes carryout research for understanding the behavior, biology and the reproductive physiology of various species and fine tune the latest available techniques to assisted reproduction and rehabilitation of zoo animals in the wild. A buffer stock of a reasonable size could also be created for use in emergencies for planned breeding and reintroduction in the wild.
8. Any project for captive breeding of endangered species should be taken up giving due regard to the number of animals held in stock by zoos. Every zoo must cooperate in such breeding programmes by way of facilitating a sound founder base through donation, loans and exchange of animals. To facilitate the process the price tag on animals of various species should be removed.
9. Any planned breeding programme for the specific objective of reintroduction in the wild should be taken up in consultation with in-situ wildlife managers, who will be responsible for identifying suitable wildlife habitats for the purpose and for prerelease conditioning of the animals to be released as well as implementing a post -release monitoring programme.
10. Zoos must contribute to research by way of providing animal blood, tissues and genetic material to eminent scientific institutions in the country for coordinated research projects approved by the Central Zoo Authority.

11. Workshops, training programmes and symposiums should be organized regularly at the national level to upgrade the technical skills of the zoo directors, zoo veterinarians and the zoo supervisors. Training programmes should be organized on a regional basis in vernacular languages to upgrade the technical skills of zoo keepers.

12. There should be a regular exchange of ideas on various technical issues among all the zoos of the country. To facilitate the process, the Central Zoo Authority should support the publication of a periodic zoo bulletin.



Dr. Lalji, CCMB at work

These recommendations, along with the World Zoos and Aquarium Conservation Strategy 1993, have served as a road map for the planned development of zoos of the country, and Central Zoo Authority has been very sincerely and earnestly taking initiatives to implement and comply with the recommendations.

As conservation education is the most important function of zoos, the Central Zoo Authority setup a committee comprising of a zoo educationalist, namely Ms. Sally Walker, member, Central Zoo Authority, Dr. Mamta Pandey, Centre for Environment Education, Ahmedabad, representatives of National Museum of the Natural History and the environmental education division of the ministry. The recommendation of the committee was communicated to zoos. In compliance with the recommendation, the zoos adopted the following measures for imparting conservation awareness amongst zoo visitors:

1. Nandankanan Zoo – Zoo guides
2. Sri Chamarajendra Zoo- Volunteers (teachers and students)
3. Thiruvananthapuram - Friends of zoos
4. Sanjay Gandhi Zoological Park – student volunteers

To safeguard against over-crowding of animals in the enclosures, guide-lines were issued to the

effect that zoos should try to restrict the number of ungulates and carnivores within the carrying capacity of the enclosures, invariably not more than 20 and 10, respectively, in any zoo. State governments were persuaded to take off the price tag of the animals and facilitate smooth exchanges and loans of animals for planned breeding programmes. However, the tendency of sticking to single/unpaired animals for the sake of maintaining the number of species exhibited at maximum possible level; still continued to plague the planned breeding programmes. Craze for exhibiting the exotic species was another bottle neck in the planned exchange of animals for breeding programmes. Efforts to redress the situation continues. The follow up pertaining to the recommendadations to up-grade the technical skills of zoo personnel and imbibe greater professionalism will be dealt with subsequent.

The World Zoo and Aquarium Conservation Strategy very loudly and clearly stated that exhibiting healthy wild animals exhibiting their species- specific behaviour in naturalistic settings is the most potent tool for effective conservation education. With due regard to the principles enunciated in the strategy, the Central Zoo Authority decided that up grading the animal housing, animal security, animal up keep and infrastructure and improving the veterinary care facilities should be considered high priority areas for which 100%funding should be provided by the Central Zoo Authority. The cost of the other works should be shared by each zoo and Central Zoo Authority on a 50:50 sharing basis. In view of the limited allocations available to Central Zoo Authority, it should provide financial assistance to large, medium and small zoos only. Mini zoos and deer parks should be funded by the state governments themselves. The evaluation reports of the zoos proved to be quite handy in obtaining a judicious release of financial assistance to the zoos.

Evaluation of medium, small and mini zoos was also got carried out on a priority basis. Evaluation of all medium and small zoos was completed by the end of the financial year 1995-1996. Since the number of mini zoos and touring zoos was quite large and many of them were in far-flung areas, their evaluation was quite a tedious job and therefore could be completed only by 1998-1999. However the evaluation of all the touring zoos and most of the mini zoos was completed by the year 1996-1997.

In keeping with decisions already taken by the Central Zoo Authority recognition was granted to all medium zoos. Of the 32 small zoos, recognition was granted to 28. Recognition was not granted to Bal Bhavan Dr.eam Land Zoo, Ahmadabad, Krishna Sayar Snake Park, Kota Zoo and Marble Palace Zoo. Marble Palace was, however, allowed to continue its operation because of its historical importance as first zoo of the country that is still operational. The Rajasthan Government was requested to move the Kota Zoo to a suitable site where adequate land for development of a good zoo was available. Krishna Sayar Zoo, Bardhman and the Bal Bhavan Dream Land were closed down. The Recognition letters were issued to each zoo, stating the period for which the recognition was granted. The Stipulated conditions required that all the inadequacies found in the zoo at the time of evaluation must be redressed within the stipulated period of recognition, which in most cases was 3 years.

Recognition was refused to all the touring zoos, which kept the zoo animals in cramped cages and moved from town to town to displaying animals in fairs and exhibitions. They could by no stretch of imagination provide congenial living conditions to animals. The owners of these zoos were also been indulging in illegal acquisition of animals. The zoo owners challenged the decision of the Central Zoo Authority in the court, which upheld the decision of Central Zoo Authority. Consequently these zoos were closed down and they surrendered their animals to the zoos authorized by the Central Zoo Authority to accept the animals.

On 31-03-2002 the total number recognized zoos in the country was 166. The category-wise and area-wise distribution of the recognized zoos is as follows:

Zoo category	Zoos with area more than 50 hectares	Zoos with area 20.1–50 hectares	Zoos with area 10.1 – 20 hectares	Zoos with area of 5.1 to 10 hectares	Zoos with area less than – 5 hectares	Total
Large Zoos	9	4	2	-	-	15
Medium Zoos	7	1	1	2	6	17*
Small Zoos	8	6	6	3	9	32
Mini Zoos	2	7	21	20	52	102
Total	26	18	30	25	67	166

* Medium zoos smaller than 5 hectares include several snake parks and Gharial breeding centres.

** The area of Sakkarbaug Zoo was increased in 1994 From 6 Hectares to 193 Hectare. The area of Rajkot Zoo and that of Surat Zoo were also increased to about 35 hectares and 32 hectares, respectively.

*** The list includes Ranchi Zoo, Ranchi; Pilikula Zoo, Mangalore and Bulbuley zoo, Gangtok which were established after 1994 and extended over an area of more than 50 hectares each.

**** Peshwe Park, Pune had an area of about 4 hectares only. The process of shifting the said zoo to Katraj had started in the year 1994, and now it has evolved to a modern zoo extending over an area of 65 hectares (Rajeev Gandhi Zoological Park, Pune).

Before arriving at the decision to close down the cramped zoos and deer parks, their value as conservation centres was assessed through research projects awarded to Xavier Institute of Management, Bhubaneswar; Indian Institute of Management, Bangalore and Institute of Mass Communication, JNU Delhi. All the three studies revealed that, mini zoos and deer parks (except for some in rural areas) hardly contribute to creation of conservation awareness amongst the zoo visitors.

A summary of the grants (in lakhs of rupees) released to the zoos from the financial year 1994 - 1995 to 1998-1999 is as follows:

Financial year	Animal enclosures & security wall	Veterinary care & hygienic supply of food & water	Environment improvement	Conservation education	Feeding of animals surrendered by touring zoos	Total
1994-95	153.61	65.87	35.15	4.27	0	258.90
1995-96	182.735	46.855	18.22	1.15	0	248.96
1996-97	152.77	48.36	15	3.96	0	220.09
1997-98	237.33	63.11	18.05	3	0	321.49
1998-99	323.08	41.64	11.42	3	14	393.14
Total	1049.52	265.83	97.84	15.38	14	1442.58

*Amount of Rs. 6 lakhs, Rs. 4 lakhs, Rs. 3.15 lakhs and Rs. 0.85 lakh respectively were given to Sanjay Gandhi Biological Park Patna, Prince of Wales Zoological Park Lucknow, Kanpur Zoological Park and Nahargarh Zoo Towards the feeding cost of animals surrendered by touring zoos.

Sl. No.	Name of the Zoo	Works done
1	Arignar Anna Zoo, Madras	Augmenting water supply, construction of store and kitchen, upgrading of veterinary facilities and animal housing
2	Alipore Zoo, Kolkata	Upgrading of Lion-Tiger, Primate and Elephant enclosures
3	Assam State Zoo	Augmentation of water supply, improving security wall and construction of Rhino enclosures
4	Bhagwan Birsa Zoo, Ranchi	Upgrading veterinary facilities and water supply and construction of ungulate, canids, Tiger, Bear and Pheasant enclosures
5	Gandhi Zoo, Gwalior	Security wall, water supply, Bear and Panther enclosures and veterinary equipment
6	Himalayan Zoological Park, Bulbuley, Gangtok	Establishment of new zoo
7	Indira Gandhi Zoo, Vishakhapatnam	Security wall, veterinary equipment, Elephant enclosure, store and kitchen
8	Kamala Nehru Zoo, Ahmedabad	Lion, Tiger, Bear and Primate enclosures & security wall

9	Kanpur Zoo, Kanpur	Water supply, primate enclosure, repair of security wall
10	Lucknow zoo, Lucknow	Security wall, store and kitchen, Elephant, Tiger and Primate enclosure, veterinary equipment
11	M. C. Zoological Park, Chhatbir, Punjab	Development of water body, water bird aviary, ungulate and primate enclosures, incinerator, drainage and equipping veterinary hospital
12	Nandankanan Zoo, Bhubaneswar	Security wall, water supply, sewage lines, upgrading of veterinary facilities, improvement of animal housing
13	Nehru Zoological Park, Hyderabad	Construction of hospital, feed store, kitchen, incinerator, boundary wall and upgrading animal enclosures
14	Padmaja Naidu Zoo, Darjeeling	Construction of veterinary hospital, water supply, breeding facilities for Red Panda and Snow leopard, improvement of Himalayan Bear, Siberian Tiger, Panther, Blue sheep and Pheasant enclosures
15	Sri Venkateswara Zoo, Tirupati	Equipping veterinary hospital, construction of ungulate enclosures and improvement of existing enclosures
16	Biological Park, Itanagar	Veterinary hospital, Tiger and Clouded leopard enclosure and Security wall
17	Van Vihar, Bhopal	Security wall, water supply, feeding cell for Bear, Tiger and Panther
18	Thiruvananthapuram zoo	Security wall, veterinary hospital, water supply, enclosures for Hippo and Rhinoceros

Procedural delays in the release of funds to the Zoos by the state governments remained a major bottleneck in expeditious development of Zoo. The grants released by CZA often remained held up at state headquarters for long durations. A Parliamentary Committee was formed under the chairmanship of Smt. Maneka Gandhi to review the situation and suggest measures to redress the bottleneck. The Committee inspected Thiruvanthapuram Zoo; Bondla Zoo, Goa and the Assam State Zoo, Guwahati and held detailed discussions with the state governments for expeditious release of funds to the Zoos. A meeting of secretaries of state governments was also convened to highlight the issue. The situation improved to a great extent after this meeting.

UPGRADING TECHNICAL SKILLS OF ZOO PERSONNEL: FOLLOW UP OF THE DECISIONS TAKEN AT THE WORKSHOP HELD BETWEEN 29TH -31ST OCTOBER 1994 [1994-1999]

TRAINING OF ZOO PERSONNEL:

a) Training programmes organized by the Wildlife Institute of India:

Wildlife institute of India organized 2 week capsule courses for zoo supervisors and zoo directors in alternate years as per details given below:

Sl. No.	Year	Targeted group	Venue	Remark
1.	1994	24 zoo directors	National Zoological Park, Delhi & MC Zoological Park, Chhatbir	Zoo Designing and Education
2	1995	38 zoo supervisors	Sri Chamarajendra , Zoological Park, Mysore	Modern Concepts of Zoo Management
3	1996	21 zoo directors	Nandankanan Biological Park, Bhubaneswar	Master Planning & Management Planning of Zoos
4	1997	38 zoo supervisors	Kanpur Zoological Park	Zoo Designing and collection Planning
5	1998	22 zoo directors	Arignar Anna Zoo, Chennai	Planned Breeding of Endangered Species

b) Training of zoo keepers

Regional level training programmes for Zoo Keepers: The Central Zoo Authority after finalizing the curriculum for the training programme of Zoo Keepers decided that training programmes should be organized for Zoo Keepers for five regions of the country at Kanpur, Bhubaneswar, Guwahati, Ahmedabad and Chennai every year and Rs. 1 lakh should be sanctioned to each centre for conducting the training programmes. The zoos conducted training programmes on 'general principles of zoo management', particularly sanitation, hygiene and handling of animals. The details are given below:

Sl. No.	Year	Venue	Remark
1	1995	<ul style="list-style-type: none">Kanpur Zoological ParkNandankanan Biological park, Bhubaneswar	A total 32 Zoo Keepers were trained
2	1996	<ul style="list-style-type: none">Kanpur Zoological Park	A total 17 Zoo Keepers were trained
3	1997	<ul style="list-style-type: none">Kanpur Zoological ParkNandankanan Biological park, BhubaneswarNehru Zoological Park, HyderabadKamla Nehru Zoological Park, AhmedabadArignar Anna Zoo, ChennaiSri Chamarajendra Zoological Park, Mysore	A total 68 Zoo Keepers were trained
4	1998	<ul style="list-style-type: none">Kanpur Zoological ParkAssam State Zoo, GuwahatiNehru Zoological Park, HyderabadKamla Nehru Zoological Park, Ahmedabad	A total 70 Zoo Keepers were trained

c) International Exposure and Training:

To provide international exposure to Zoo Directors and the Zoo Veterinarians the practice of deputing one Zoo Director and one Zoo Veterinarian to a 3 week training programme on conservation at Jersey Wildlife Preservation Trust, United Kingdom continued and the following officers were trained there:

Sl. No.	Year	Name	Position
1	1995	Mr. A.S. Dogra Dr. K.C. Patro	Director, MC Zoological Park, Chatbir Veterinary Officer Nandankanan Zoo, Odisha
2	1996	Mr. Jaganannadh Rao Dr. Vinay Gore	Director, Arignar Anna Zoo, Chennai Veterinary Officer, Peshwe Park, Pune
3	1997	Ms. Mamata Sharma Dr. Paneer Selvam	Director, Kanpur Zoo, Kanpur Veterinary Officer, National Zoo Delhi
4	1998	Mr. N. Raj Shekhar Dr. S.M. Rizawi	Director, Mysore Zoo Veterinary Officer & Director, Aurangabad Zoo

Workshops Organized by Central Zoo Authority:

a) Zoo Directors and Zoo Veterinary Workshops

Sl. No.	Year	Subject	Venue	Remarks
1	1995	Planned breeding of Asiatic Lions	Sinh Sadan, Junagadh	PCCF, Gujarat actively participated in the discussions
2	1996	Follow-up of policy decisions of CZA	India International Centre, Delhi	Secretary Environment and Forest, Government of India reviewed
3	1996	Healthcare of Zoo Animals	Indian Veterinary Research Institute, Bareilly	Director of the Institute presided over the valedictory function
4	1998	Modern Concepts of Zoo Management	Veterinary College Mumbai	Mr. Bernard Harrison, Ex-Director Singapore Zoo gave keynote address



b) Other Workshops and Training Programme

Year and Month	Theme of the Workshop	Venue	Lead Expert	Target Audience
February, 1995	PHVA on Lion tailed Macaque	CBSG India	Lauri Gladhill (Stud book keeper for Lion tailed macaque)	
October, 1995	PHVA on Swamp Deer	Wildlife Institute of India	Dr. Uli Seal- Chair Person CBSG (IUCN)	Park managers, Researcher & zoo directors
May, 1996	Breeding of Red Panda	Padmaja Naidu Zoological Park, Darjeeling	Dr. Angela Glaston, Rotterdam Zoo (Stud book keeper for Red Panda)	Park managers and zoo personnel
October, 1996	Animal Nutrition	Aragnar Anna Zoo Chennai	Madras Veterinary College	Zoo personnel

Collaboration with Veterinary Colleges and Agriculture Universities

Despite the upgrading of zoo hospitals and training of Zoo Veterinaries the practice of treating animals on a symptomatic basis prevailed in zoos at the time of the constitution of the Central Zoo Authority. As decided at the workshop held at Delhi in 1994-95, zoos were persuaded to seek the support of the nearest veterinary college to help carrying out detailed investigations of the sick animals and diagnose the diseases affecting them. Their advice would be crucial in preventing diseases and the treating sick animals. Many Zoos entered in to an understanding with such Institutions and formed health committees for periodic health checks and help with treatment of seriously sick animals. Below is the list of such zoos is as follows:

Sl.No.	Name of the Zoo	Supporting Veterinary Institution
1	Nandankanan Zoo	Orissa University of Agriculture & Technology, Bhubaneswar
2	Assam State Zoo	Veterinary college, Khanpara, Guwahati
3	M.C. Zoological Park, Chhatbir	Veterinary college, Ludhiana
4	Arignar Anna Zoo	Chennai Veterinary college
5-7	National Zoological Park, Delhi Kanpur Zoological Park, Kanpur Prince of Wales Zoological Park, Lucknow	Wildlife disease division of Indian Veterinary Research Institute, Bareilly

*Standard books on Veterinary aspects of Zoo management were also supplied to all Zoo hospitals.

Genetic Management In Zoo Animals

Traditionally, Zoos have acquired siblings for display in their animal collections because they are easier to manage and the chance of inbreeding is minimal. The continuous loss of heterozygosity

invariably results in congenital diseases. As a safeguard against inbreeding, studbooks are to be maintained for endangered species. Somehow no studbooks were available for most of the species. Indian zoos around had big collections of Tigers and Lions in 1994. The Central Zoo Authority hired the services of two scientists, namely Shri Vipul Chakraborty and Shri Bhaskar to go from zoo to zoo and collect data about the pedigree of all the Lions and Tigers in the Zoos and the first studbooks were published for these two species. At a meeting of Zoo directors, their responsibility of maintaining studbooks for the important endangered species was highlighted. Below is the list zoos nominated as studbook keepers was as under:

Sl. No.	Species	Name of the studbook keeper zoo
1	Wild Ass	Sakkarbaug Zoological Park, Junagarh
2	Sangai	Alipore Zoological Garden, Kolkata
3	Golden Langur	Assam State Zoo, Guwahati
4	Swamp Deer	National Zoological Park, Delhi
5	Bengal Tiger	Nandankanan Zoological Park, Odisha
6	Asiatic Lion	Sakkarbaug Zoo, Junagarh
7	One Horned Rhino	Kanpur Zoological Park, Kanpur
8	Gaur	Nandankanan Zoological Park, Odisha
9	Red Panda	Padmaja Naidu Zoological Park, Darjeeling
10	Snow Leopard	Padmaja Naidu Zoological Park, Darjeeling
11	Lion Tailed Macaque	Arignar Anna Zoological Park, Chennai
12	Sloth Bear	Prince of Wales Zoological Park, Lucknow

The progress was not very satisfactory due to poor coordination and non-marking of animals. Sri S.K. Patnaik, Director, Nandankanan Biological Park, however, identified and marked all the wild tigers in 9 zoos with transponders with the help of Dr. L.N. Acharjyo. A breeding plan was also prepared and some animals moved accordingly.

In the early 1990s, the American scientist Mr. S.J. O'Brien visited India and analysed DNA of Lions in Gir National Park, Gujarat. He raised doubts about the long term survival of Asiatic Lion in view the low level of heterozygosity in the park population of the park. At this point of time, the zoo experts outside India were making a great hue and cry about the animals of Indian zoos being highly inbred. There was a growing demand for the use of assisted reproduction for boosting up of the growth of the endangered species. For addressing both the issues in the Country, the Central Zoo Authority entered into a memorandum of understanding with the Centre for Cellular and Molecular Biology, Hyderabad to carry out 'Molecular Characterization' of wild animals through DNA fingerprinting for managing animals in the zoos and semen analysis and assisted reproduction of endangered species of zoo animals at an estimated cost of Rs. 20 lakhs per year. Semen analysis of Lions revealed that despite low heterozygosity levels, the mortality of spermatozoa is quite high and there was no chance of the population of Asiatic Lions going extinct. It was also confirmed that the heterozygosity level has been almost constant for a decade and no further decline is taking place.

DNA fingerprinting has proved to be a very useful tool for sexing, testing genetic purity and determining the degree of inbreeding in zoo animals. The Institute can now carry out DNA fingerprinting even from faecal samples and no capture/restraining of animals is essential. Work on Cryo-preservation and Artificial insemination was also taken up.

Inter-Zoo Communication

In pursuance of the decisions taken at the meeting held in Delhi in 1994, the Central Zoo Authority requested the president of the Zoo Directors' Association, Shri S.K. Patnaik, to bring out a quarterly newsletter on the important events taking place in various zoos of the country. The publication of the quarterly newsletter started in October, 1994 with the assistance of Dr. L.N. Acharjyo from Bhubaneswar, and continued till January, 2003, though with gaps, giving zoo directors, veterinarians and other zoo personnel a forum to share their experience and learning with other zoos. The association also brought up a compendium of papers published from Indian Zoos in three volumes, Volume 1, Health & Disease Management (1997); Volume 2, Animal Biology & Conservation (1998) and Volume 3, Health & Disease Management (2000), about 1500 pages in all. The association also brought out the *Indian Zoo Year Book*, highlighting the major developments in the zoos of the country. The first volume was published in the year of 1996 and the last volume (Volume VII) was brought out in 2013. These contain excellent reference material. The first Annual report of CZA was published in 1992 and continues to be published every financial year.

The annual meetings of the Zoo Directors' Association and Zoo Veterinarians' Association were also facilitated by the Central Zoo Authority, where views shared freely. Special meetings of Zoo directors were also called for discussing important issues with them.

Housing of Rescued Animals

The compassion and love for living beings is deeply entrenched in the public psyche of the people of the country. They don't wish to kill an animal even if it harms them. Generally, such harmful animals are brought by them to a zoo for being housed in congenial living conditions. The CZA encouraged zoos to construct enclosures to house the rescued animals away from the main zoo enclosures. The necessary quarantine facilities were also created.

NATIONAL ZOO POLICY

With the objective of creating greater awareness about the role of the zoos in the country and providing a direction to the management of zoos in the country, the Central Zoo Authority finalized the National Zoo Policy for the country, which was notified by the Government of India on the 29th October, 1998. The policy defines the following main objectives for the zoos of the country;

1. Coordinated breeding under ex-situ conditions and raising stocks for rehabilitating them in the wild as and when it is appropriate and desirable.
2. Instilling amongst zoo visitors empathy for wild animals, and an understanding and awareness about the need for conservation of natural resources and for maintaining the ecological balance.

3. Providing opportunities for scientific studies useful for conservation in general and creation of a database for sharing between the agencies involved in-situ and ex-situ conservation.
4. Functioning as rescue centres for orphaned wild animals subject to the availability of appropriate housing and infrastructure for their upkeep. Where appropriate housing and upkeep of infrastructure are not available, the state Government and the Central Government will create rescue facilities in the off-display area of the zoo, subject to availability of the land.

The policy describes a detailed strategy for achieving the above set of objectives and lays great emphasis on the involvement of research institutes and non-governmental organizations in research and training related to zoo management. It also lays emphasis on giving priority to species endemic to the zoo-geographic zones where the zoos are located. Thematic displays of animals and interpretation of the theme through appropriate signage is also a very important component of the policy.

ERA OF MAJOR CHALLENGES AND BOLD INITIATIVES [1999-2004]



Meeting of Central Zoo Authority under the chairmanship of thiru T.R. Baalu, MEF

Rehabilitation of Nandankanan Zoo after devastation by super cyclone

In winter, in 1999, the strongest tropical, cyclone ever recorded in the Northern Indian Ocean struck the coast of Orissa. The wind velocity was so high that the Nandankanan zoo was almost completely devastated and was closed to visitors for about a year. The Central Zoo Authority provided financial assistance to an extent of Rs.1.43 crores to rehabilitate the zoo and reconstruct the facilities damaged facilities. The major work consisted of reconstruction of animal enclosures, renovation of the veterinary hospital and restoration of the water and power supply.

Large scale sudden mortality of zoos animals and mitigation measures:

In February, 2000, 12 Tigers died at Nandankanan Zoo because of trypanosomiasis. The deaths were spread over several days. This created a hue and cry both in the national media and the

international media. It was alleged by the activists and the media persons that the deaths were caused due to negligence of the staff. An enquiry revealed that the zoo staff had administered a prophylactic drug to the animals just a day before the deaths started. Local people believed that the animals had died because of the manner in which the Drug was administered/and appropriateness of the drug. The parliamentary committee of the ministry visited the zoo to get first-hand knowledge of the incident. One full working day of the Parliament was spent, on discussing the issue. The Minister of Environment & Forest was able to convince the Parliament that the deaths occurred due to the disease and not because of any negligence on the part of the staff.

Agitated activists raised the matter before the Hon'ble Supreme Court. The court directed the Member Secretary of the Central Zoo Authority to appear in person and explain the cause of the poor standards of animal upkeep in Indian zoos. During discussions, it came out that the state governments were keen on opening new zoos in the constituencies of the influential members of Parliament, and MLAs, rather than improving the existing zoos. The Hon'ble Supreme Court ordered on the 27th of November 2000, that the state governments would not open any zoo without the prior approval of the Hon'ble court and the Central Zoo Authority. No permission would be given by the Court for opening a new zoo by the state government unless the Central Zoo Authority was fully satisfied that the existing zoos of the concerned state have complied with all the conditions stipulated by the Central Zoo Authority. A provision was also made in the Wildlife (Protection) Act to the effect that the no new zoos shall be established in the country without the prior approval of the Central Zoo Authority. Detailed guidelines were also issued prescribing norms for establishing new zoos in the country.

The Central Zoo Authority gave detailed directions to Nandankanan Zoo to take adequate safeguards to prevent, such happenings in the future. The zoo was asked to complete a perimeter wall the of prescribed dimensions around the zoo and maintain hygienic conditions around all the animal enclosures of the zoos. Adequate funds were made available for the purpose.

Death of Tigress at Hyderabad Zoo

Some mischief mongers killed and took away the skin of a female Tiger cub from Hyderabad zoo. This was the first incident of its kind in the history of zoos in India. Never before had any person dared to enter the a zoo campus to kill any wild animal. The Prime Minister of India and the Chief Minister of Andhra Pradesh personally monitored the investigation of the matter, and the culprit was ultimately brought to book. To safeguard against such happenings in the future, Rs. 68 lakhs was granted to the zoo to reinforce the security wall and install CCTV to enable facilitate the security staff to protect, the zoo in effectively in the night hours.

Initiatives to redress the issue of zoo animal mortality:

As if the Nandankanan Zoo mortalities were not enough, two Rhinos died on a single day in Delhi Zoo despite the best efforts of the zoo veterinarian. These events shook the confidence of the public in the Central Zoo Authority and the zoos. People started questioning the very existence of zoos. To restore the confidence and bring greater transparency in the working of the zoos, the Central Zoo Authority started bringing out an annual inventory of the animals held in the stock of zoos from the year 2000–2001. This required a systematic approach towards the collection and analysis of data, for which appropriate a management information system was implemented.

It was felt that zoo veterinarians cannot handle the prevailing situation on their own. The support of experts outside the zoos is crucial for redressing the problem. The Central Zoo Authority therefore decided to create a regular mechanism for collaboration between eminent veterinary colleges and the research institutes in different regions of the country and the zoos located there. Funding was provided to various institutions for creating the necessary diagnostic facilities. The details of these facilities as per details given below:

Sl.No.	Name of the Institution	Purpose	Financial grant given
1	Indian Veterinary Research Institute, Bareilly	Zoos of north India	Rs 67.7 lakhs
2	Veterinary College Khanpara, Guwahati	Zoos of the North-eastern region	Rs 45 lakhs
3	Orissa University of Agriculture & Technology, Bhubaneswar	Zoos of eastern India	Rs 32.3 lakh
4	Chennai Veterinary College	Zoos of south India	Rs 42.68 lakhs
5	Veterinary College, Anand	Zoos of western regions	Rs 47.85 lakhs
6	Veterinary College, Jammu	Zoos of J&K Region	Rs 10 lakhs
7	Indian Institute of Animal Health, Bangalore	Special purpose study	Rs 2.5 lakhs
	Total		Rs 248.04 lakhs

The authority worked with the Veterinary Council of India on the idea of introducing a capsule course on wildlife disease diagnosis and treatment in the Bachelor of Veterinary Sciences curriculum veterinary college of the country. A provision was also made in the College curriculum to the effect that during their final year at the veterinary college, all every students work as interns at a zoo for a minimum of 15 days. The practice continues even today and has proved quite useful in the making the young veterinarians interested in pursuing their career at the zoos and the wildlife wings of the state.

An international workshop on diagnosis, control and treatment of blood borne diseases was held at Chennai on 19th and 20th July 2000. Renowned doctors from foreign zoos also participated in this workshop. On the basis of the deliberations detailed guidelines on monitoring hygiene and incidences of blood borne diseases in zoos were issued on the 20th June 2003. A detailed protocol for health monitoring was also finalized and sent to the zoos for compliance. An international workshop on the healthcare and management of wild animals in zoos was held at New Delhi from 7th to 9th May, 2003 in which a large number of zoo veterinarians from South east Asia, Europe and USA participated. The workshop urged the zoo veterinarians to adopt scientific methods of disease diagnosis and treatment of sick animals at their zoos.

ESTABLISHING RESCUE CENTRES FOR CIRCUS ANIMALS

By the end of 1998 the things appeared to be moving in the direction planned by the Central Zoo Authority the zoos were being prepared for effective conservation education and planned breeding of endangered species. Somehow, by the, year end of 1998, a major challenge

emerged in the form of a notification, dated 14th Oct 1998, from the Government of India for banning the display of Lions , Tigers, Leopards, bears and monkeys in the circuses. The numbers of these species held by circuses at that point of time was 212, 96, 26, 56 and 50 respectively. The basic objective of imposing the ban was to provide congenial upkeep, housing and healthcare to these animals keeping with the spirit of the National Zoo Policy. The Central Zoo Authority had to assume the responsibility. Housing 212 lions and 96 tigers was a massive task as such a large number could not be accommodated in the existing housing facilities of the zoos. The government agreed to create designated rescue facilities for these animals and requisite allocations were made in the budget of the Central Zoo Authority in the year 1999-2000. After finalizing the designs of the rescue centres the following amounts were released to the zoos that had requisite land of the purpose.



Resuce centre for lions at Arignar Anna Zoological Park, Vendalure, Chennai

Name of the zoo (financial)	Capacity of the rescue centre	Funds in lakhs of years of allocation)
Arignar Anna Zoological Park, Chennai	60	204.75 (1999–2001)
National Park Zoo, Bannerghatta, Bangalore	100	241.50 (1999–2001)
Indira Gandhi Zoological Park, Vishakhapatnam	60	196.75 (1999–2002)
Nahargarh Zoo, Jaipur	50	100 (1999–2000)
Venkateshwar Zoo, Tirupati	30	170.05 (1999–2002)
Total	300	913.05 (1999–2002)

It need not be highlighted that the recurring costs of feeding, upkeep and health care are being paid by the Central Zoo Authority every year, details of which will be indicated subsequently. To ensure compliance with the prescribed standards and norms pertaining to sanitation, hygiene and effective administration of prophylactic medicines, zoos were advised to have health committees constituted for every zoo.

EX-SITU CONSERVATION OF VULTURES

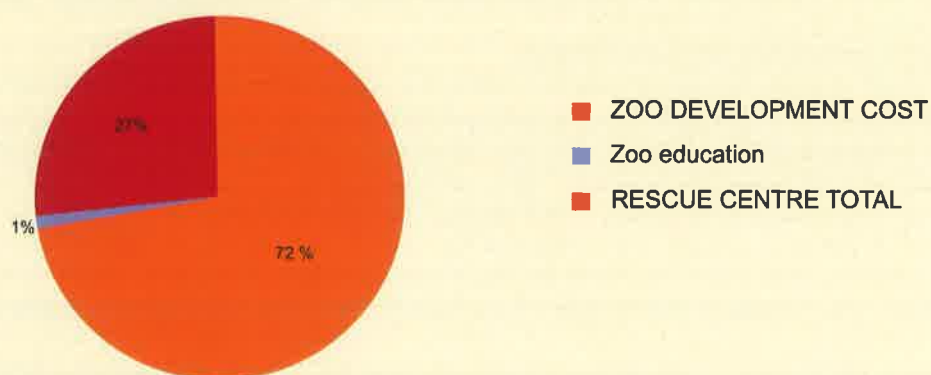
From 1990 onwards there was a serious decline in the populations of vultures in the country. By 1998 it was amply clear that the Long Billed Vulture (*Gyps indicus*), Slender billed vultures (*Gyps tenuirostris*) and white backed vultures (*Gyps bengalensis*) needed to be bred in captivity and introduced in the wild for the long term survival of these species. The Bombay Natural History Society took the lead in the matter and a breeding centre was established for these species at Pinjore in Haryana. to carry the programme the then ---- core group on vulture breeding suggested establishment of such sub centres Bhopal, Junagarh, Hyderabad, Bhubaneswar, Guwahati and Rajabhatkhawa (northern West Bengal). The Central Zoo Authority agreed in principle to support the setting up of such centres. However, the establishments concerned required detailed plans for the centres including details of the scientific staff who were needed to carry out the conservation activities. The proposal in this regard were not available till the end of the 2003-2004. Therefore the proposal could not be executed. However, a regular technical exchange was maintained with the Pinjore centre, and the requisite support was provided to them.

CONTINUED CORE FUNCTIONS OF CENTRAL ZOO AUTHORITY

While all these activities were taking place, Central Zoo Authority made every effort for to develop zoos in a planned manner and upgrade technical skills. The grants released by the Central Zoo Authority for planned development of zoos from 1999-2000 to 2003-2004 are as follows:

Item of work	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	Total in (lakhs of Rs)
Animal enclosures	301.11	439.71	435.02	570.69	546.3	2292.83
Veterinary facilities	47.43	71.14	152.86	62.41	87.85	421.69
Hygienic storage of food	7	9.69	12.2	7	7.5	43.39
Water supply	33.11	69.5	94.25	75.87	24.89	297.62
Sanitation and hygiene	14.88	26.66	4.08	10.1	19.75	75.47
Security	21.46	254	99.75	61.58	51.75	488.54
Road and path				16.5	37.56	54.06
Zoo education	1.9	20.12	0.25	12.45	11.4	46.12
Construction of rescue centres	625	57.67	65.8		80	828.47
Upkeep of rescued animals	21.69	17.2	111.3	151.72	240.59	542.5
Miscellaneous		1	1.84	4.4	54.57	61.81
Total	1073.58	966.69	977.35	972.72	1162.16	5152.5

*The mechanism of release of funds to zoos by state government was too complicated and time consuming. Hence, the funds remained unutilized for several years. The state governments were requested to give an undertaking that the funds would be utilized by zoos without following the normal budget procedure for the works approved by the Central Zoo Authority.



Major Beneficiaries of CZA Grant

Sl. No.	Name of zoo	Major work done
1	Aizawal Zoological Park	Construction of zoo at new site
2	Padmaja Naidu Himalayan Zoological Park, Darjeeling	Veterinary hospital, store & kitchen, boundary wall, animal enclosures
3	Assam State Zoo, Guwahati	Veterinary hospital, boundary wall drainage and animal enclosures
4	Tiger Safari Shimoga	Veterinary hospital and animal enclosures
5	Thiruvananthapuram Zoo	Animal enclosures
6	Itanagar Biological Park	Security wall, veterinary hospital and animal enclosures
7	Nandankanan Zoo	Security wall, veterinary hospital, animal enclosures and drainage
8	Himalayan Zoological Park, Bulbule, Gangtok	Development of a new zoo
9	Nehru Zoological Park, Hyderabad	Animal enclosures and security wall
10	National Zoological Park, Delhi	Security wall and animal enclosures
11	Kamala Nehru Zoo, Indore	Security wall, veterinary hospital, water supply and animal enclosures

12	Indroda Zoo, Gandhi Nagar	Veterinary hospital and animal enclosures
13	Chiriyatapu Zoo, Port Blair	Development of a new zoo
14	Gandhi Zoo, Gwalior	Veterinary hospital, security wall and animal enclosures
15	Kanpur Zoological Park	Security wall, veterinary hospital and animal enclosures
16	Sanjay Gandhi Biological Park, Patna enclosures	Veterinary hospital & animal Park,
17	Rangapahar Zoo, Nagaland	Development of a new zoo
18	Alipore Zoo, Kolkata	Animal enclosures, water supply and drainage
19	Sri Chamrajendra Zoo, Mysore	Veterinary hospital, store, kitchen and animal enclosures
20	Bhagwan Birsa Zoo, Ranchi	Animal enclosures, water supply, veterinary equipment
21	Rajiv Gandhi Zoo, Pune	Veterinary hospital and animal enclosures
22	Manipur Zoo	drainage, veterinary hospital, kitchen and animal enclosures
23	Sakkarbaug Zoo, Junagarh	Security wall and animal enclosures

*The Central Zoo Authority gave higher priority to upgrading of veterinary facilities, construction of security walls, providing a water supply and upgrading animal housing. Completion of development of new zoos was given the highest priority.

The designs prepared by the zoos were generally not found to be of the required standards. Therefore, the Expert Committee of Zoo Designing was constituted. The grants were released only for the projects approved by the committee. Inadequacies in the designs, wherever found, were referred back to the zoos for rectification.

Legislative functions:

The Wildlife (Protection) Act was amended in the year 2003 to bring the circuses and rescue centres under the definition of zoos. Consequently, the Recognition of Zoo Rules was amended in the year 2004 to include both these types of institutions.

Research activities:

The Central Zoo Authority continued to fund research projects related to DNA finger printing and assisted reproduction at the Centre for Cellular and Molecular Biology (CCMB), Hyderabad to meet the needs of Indian zoos. A programme committee, under the chairmanship of the

Additional Director General Wildlife- cum- Chairman of the Technical Committee of the authority monitored the progress of the research projects every year and finalized the research programme for the next year. It was felt that the CCMB was too busy to meet the research needs of Indian zoos. Therefore, a decision was taken to establish a separate institute. This was called the Laboratory for the Conservation of Endangered Species (LaCONES). The Government of Andhra Pradesh provided land near the zoo for the project free of cost. The Minister of Environment and Forests, Government of India laid the foundation stone of the project, announcing that Rs. 360 lakhs would be contributed by the Central Zoo Authority for the purpose. The Director, CCMB successfully persuaded the Council of Scientific and Industrial Research (CSIR) to provide the necessary posts of scientists for running the institute. The operational costs of the institute were to be met by the Central Zoo Authority and the Department of Science and Technology, Government of India. The institute is fully functional now, after its dedication to the nation by the President of India.



LaCONES, Hyderabad

Linkages with In-situ conservation:

In 2001, the Singapore wildlife authorities confiscated a consignment of Star Tortoises exported from India. The tortoises were brought back to Nehru Zoological Park, Hyderabad. All the animals were subjected to DNA fingerprinting and after it was ensured that the animals were of the same species that is found in Andhra Pradesh, all the animals were released in the wild. In 2003-2004, Padmaja Naidu Himalayan Zoological Park, Darjeeling released two Red Pandas into the wild according to the IUCN guidelines. Post-release monitoring was also conducted, and one animal was successfully rehabilitated. Consequently, two more animals were released and these are doing well there & have successfully bred also.



Back to the wild

UP-GRADATION OF TECHNICAL SKILLS OF ZOO PERSONNEL

a) Training of senior zoo personnel:

Wildlife Institute of India organized 2 week capsule courses for zoo supervisors and zoo directors in alternate years, the details of which are given below.

Sl.No.	Year	Targeted Group	Venue	Remark
1	2000	30 Zoo Supervisors	Alipore Zoo, Calcutta & Nandankanan Biological park, Bhubaneswar	Record keeping particularly stud book maintenance and animal management
2	2001	15 Zoo Directors	Indira Gandhi Zoological park, Vishakhapatnam	Modern Concept of Zoo Management
3	2002	25 Zoo Supervisors	Van Vihar Bhopal	Scientific upkeep and care of zoo animals
4	2003	25 Zoo Directors	Arignar Anna Zoo, Chennai and Nehru Zoological Park, Hyderabad	Endangered Species and Zoo Management

b) Training of zoo keepers:

Two week capsule courses were organized for zoo Keepers for providing training in the general principles of zoo management, particularly sanitation, hygiene and handling of animals as per details given below:

Sl.No.	Year	Venue	Remark
1	1999-2000	Kanpur Zoological Park Nandankanan Biological park, Bhubaneswar Nehru Zoological Park, Hyderabad Kamla Nehru Zoological Park, Ahmedabad	Total 140 Zoo Keepers were trained
2	2001-2002	<ul style="list-style-type: none">• Kanpur Zoological Park• Nehru Zoological Park, Hyderabad• Assam State Zoo• Nandankanan Biological park, Bhubaneswar	Total 109 Zoo Keepers were trained
3	2002-2003	<ul style="list-style-type: none">• Kanpur Zoological Park• Kamla Nehru Zoological Park, Ahmedabad• Arignar Anna Zoo, Chennai	Total 93 Zoo Keepers were trained
4	2003-2004	<ul style="list-style-type: none">• Kanpur Zoological Park• Assam state Zoo, Guwahati• Nehru Zoological Park, Hyderabad• Kamla Nehru Zoological Park, Ahmedabad• Nandankanan Biological park, Bhubaneswar• Sri ChamrajenDr.a Zoological Park Mysore	Total 113 Zoo Keepers were trained

c) International exposure and training

To provide zoo directors and zoo veterinarians with international exposure, the practice of deputing one zoo director and one zoo veterinarian to a 3 week training programme on conservation at Jersey Wildlife Preservation Trust, U.K. continued, and the following officers were trained there:

Sl. No.	Year	Name	Position
1	1999-2000	Mr. B.C. Prusty Dr. R.K Sahu	Director, Nandankanan Zoo Veterinary Officer & Superintended, Ahmedabad Zoo
2	2000-2001	Mr. Y.S. Yalaki Dr. S.K.Bhowmik	Director Thirvuntapuram Zoo Veterinary Officer, Sepahijhala Zoo

3	2001-2002	Mr B.S. Bonal Dr. Abhijeet Bhowmik	Director National Zoo, Delhi Veterinary Officer, Alipore Zoo Calcutta
4	2002-2003	Dr.. N. Manoharan Dr. Utkarsh Shukala	Director ,VOC Park Zoo Veterinary Officer, Prince of Wales Zoological Park, Lucknow
5	2003-2004	Mr A.M. Anjanker Dr. M.S. Kadari	Director, Rajiv Gandhi Zoo, Pune Veterinary Officer, Sri Chamrajen Dr.a Zoological Park Mysore

d) Workshops organized by Central Zoo Authority

1) Zoo Directors and Zoo Veterinary Workshops

Sl. No.	Year	Subject	Venue	Remarks
1	1999	National Zoo Policy	Kanpur, Zoo	Minister of Environment o forest UP presided
2	1999	Health & Management of Zoo Animals	Veterinary College, Khanpara, Guwahati	
3	2000	Animal collection Plans for zoos	Indira Gandhi Zoological park, Vishakhapatnam	Practical Exercise
4	2001	Basics of Captive Animal management Institute	Delhi	Workshop conducted by Indian Veterinary
5	2001	Zoos in the next millennium	Alipore Zoo, Calcutta	125th anniversary of the zoo
6	2002	Management of of Wildlife and Zoo and Neonatal care	Thirvuntapuram Zoo	Organized by Association Endangered Wild Animal veterinarians
7	2002	Marking of lion tailed macaques	Arignar Anna Zoo, Chennai programme	Captive breeding
8	2003	Zoos as a Ex-situ Conservation Centre Endangered Species of Wild Animals	Padmaja Naidu Himalayan zoological park Darjeeling	On the occasion of the release of Red Panda into Wild
9	2004	All India Zoo Veterinarians Workshop on restraint of wild animals also held	Lucknow Zoo	Annual meet of Zoo Vets



Indian Zoo Director's Conference at Calcutta

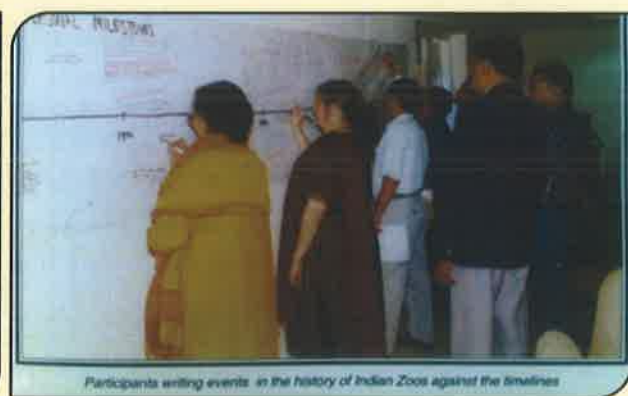
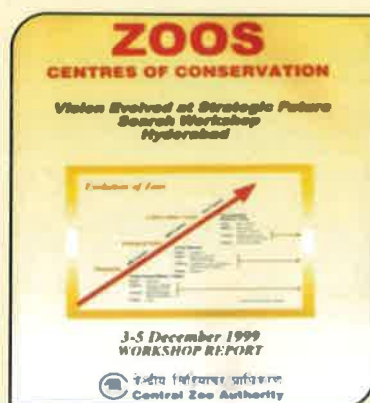
2) Future search Workshops

The Future Search Workshop was organized at Hyderabad from 3 to 5 December 1999, and zoo directors, animal welfare enthusiasts and zoo experts participated. The workshop was facilitated by Frances Westley and Harrie Vrendenberg. The workshop arrived at the following strategic vision:

Our zoos will have healthy animals in ecosystem based naturalistic enclosures supportive to in-situ conservation with competent and contended staff, good educational and interpretative facilities, the support of the people and be self-sufficient

The workshop discussed ways and means of realizing the strategic vision.

The Central Zoo Authority has been striving to realize the vision and has travelled quite a distance, but there is still a long way to go.



Important Publications of the Central Zoo Authority

The following publication were brought out to help zoos provide healthcare:

- a) Protocol on Postmortem of Elephants ----- Dr. J.B. Cheeran
- b) Basic Postmortem Requisites for Zoos ----- Dr. Matthew John
- c) Management of Elephants in Zoos ----- Dr. L.N. Acyaryjo
- d) Animal Nutrition ---Dr. B.M. Arora

PROACTIVE APPROACH TOWARDS PLANNED AND SCIENTIFIC DEVELOPMENT OF ZOOS [2004–2010]

(a) Master plan for long term planned development of zoos

Long term master planning for development is sine-qua-non for effective utilization of financial resources for development. Thus a definite provision was made in the Recognition of Zoo Rules, 1992 to the effect that every zoo should have a long term master plan for development. Some efforts were made by the Central Zoo Authority to ensure that zoos developed such a master plan, but that did not happen due to the logistics involved and major new challenges emerging from time to time. A minimum level of operational capabilities had to be in place before having firm and time-bound action plans. Because we had a definite zoo policy in place and the necessary infrastructure had been created in various zoos, it was felt that it was the right time to put in place a more structured approach for planning and future development.

The Central Zoo Authority made some efforts in the last decade to develop master plans for certain zoos by hiring Indian consultants, but the outcome often did not go beyond the master layout plan stage. Under these circumstances it was thought appropriate to hire the services Jon Coe, landscape architect, zoo planner and designer from Australia to conduct a workshop on master planning for zoo directors at Bhubaneswar from 11 to 16 April 2006. In the workshop not only were the basic concepts of master planning were explained but modern concepts such as landscaping, immersion exhibits, environment enrichment, scientific collection planning and visitor circulation were discussed. At the end of the workshop, a detailed presentation on the definition and processes of master planning was given. A comprehensive format for preparing master plans that was developed by the Central Zoo Authority was approved by the technical committee on 19 July 2005. It was also presented and explained to the zoo directors.



Master Planning workshop at Bhubaneswar

As a follow-up measure, the Member Secretary conducted meetings at various state headquarters to facilitate finalization of themes and concepts of master planning for various zoos. The zoos were notified of the themes finalized at these workshops, and they were provided financial assistance for developing master plans. The zoos were given 1 year for completing the master plan. They were also informed that after the lapse of this period all grants would be provided by the Central Zoo Authority to the zoo only on the basis of the master plan approved by the authority. Some zoos did prepare their master plans in the stipulated period, and the same were approved by Central Zoo Authority. But most of the zoos could not adhere to the time frame because the process required a thorough appraisal of the existing infrastructure of the zoo, followed by the development of a detailed strategy to redress the inadequacies. This needed inputs from experts outside the zoo for the purpose, particularly in architecture, veterinary sciences and zoo biology.

b) Planned breeding of animals of endangered species in zoos

Planned breeding of endangered species has been high on the agenda of the Central Zoo Authority but success has been by and large limited to only a few species. These are the Red Panda (at Padmaja Naidu Himalayan Zoological Park, Darjeeling), Lion Tailed Macaque (at Arignar Anna Zoo, Chennai), Rhino (at Sanjay Gandhi Biological Park, Patna), Gaur (at Sri Chamrajendra Zoological Park, Mysore), Nicobar Pigeon (at Kamala Nehru Zoological Park, Ahmedabad) and Asiatic Lion (at Sakkerbaug Zoo, Junagarh and Nehru Zoological Park, Hyderabad). Success in breeding endangered species was achieved by some other zoos also, but they could not sustain it. Under the circumstances, the populations of most of the endangered species in zoos have been quite low. To resolve the situation, Central Zoo Authority decided to go in for a planned breeding programme, following the guidelines contained in the World Zoo and Aquarium Conservation Strategy 2003 namely:

- a) Increase the breeding space allocated to the species, preferably in off-exhibit areas.
- b) Increase the intensity of genetic management.
- c) Improve husbandry practices through investment in research on husbandry, behavior, nutrition and veterinary research.
- d) Increase the number of founder animals of the breeding programmes.

The Central Zoo Authority formulated a detailed protocol for carrying out the planned breeding programme in the country. Seventy-two species were identified for planned breeding. For each species a coordinating zoo and few participating zoos were identified. The main responsibilities of planned breeding of endangered species would be that of the coordinating zoo. Funding had been provided by the Central Zoo Authority, initially to 35 zoos to create breeding enclosures and allied facilities in off-exhibit areas of the zoos for the species identified. A total amount of approximately Rs.675 lakhs was released to the zoos for carrying out the planned breeding programme between 2004–2005 and 2009–2010. In order to apprise the zoo directors of the need to prepare species recovery plans for various endangered species, a workshop, "Conservation Breeding Initiatives", was held at Delhi, to which Dr. Robert C. Lacy, Chairman, CBSG, Gordon McGregor Reid, President, WAZA and scientists from India and abroad were called as resource persons.

Representatives of several zoos from Europe and the U.S.A. also participated. The workshop made very valid recommendations for carrying the conservation breeding programme forward.



Establishment of display breeding centers at Coordinating Zoos facilities:-

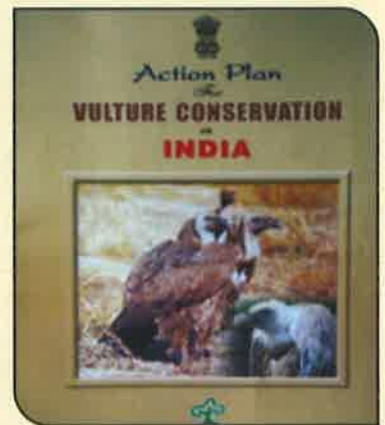
Sl. No.	NAME OF THE SPECIES	NAME OF COORDINATING ZOO	ESTABLISHMENT COST OF THE BREEDING CENTER Rs. IN lakhs
1	Asiatic lion	Sakkarbaug Zoo, Junagarh	(Created By State Govt.)
2	Mouse deer	Nehru Zoological Park, Hyderabad	18.00
3	Lion tailed Macaque	Arignar Anna Zoo, Chennai	16.70
4	King Cobra	Pilkula Biological Park, Manglore	10.00
5	Indian Pangolin	Nandankanan Biological Park	10.00
6	Sangai	Manipur State Zoo	54.98
7	Clouded Leopard	Sepahijhala Zoo	28.64
8	Hoolock gibbon	Itanagar Biological Park	50.67
9	Stump tailed macaque	Aizwal Zoo	57.5
10	Grey Jungle fowl	Vanketeshwar Zoo, Tirupati	30.00
11	Painted roof turtle	Kukrail deer park	7.94
12	Shaheen Falcon	M.C. Zoological Park, Chatbir	30.00
13	Hymalayn Monal	Nehru Pheasntry, Manali	44.00
14	Western Tragopan	Sarahan Pheasntry, Rampur	86.50
15	Wild Ass	Sakkarbug zoo, junagarh	(Created By State Govt.)
16	Four horned antelope	Sakkarbug zoo, junagarh	(Created by State Govt.)

- Pinjore Vulture Breeding Centre, Morni Pheasantry and Pygmy Hog Breeding Centre were established by the BNHS, Haryana Government and Dr. Gautam Narayan, respectively.
- The Chail Pheasantry and Snow Leopard Breeding Centre, at Darjeeling, were established prior to the establishment of the Central Zoo Authority.
- Thus off-display conservation breeding centres for 23 species (including three species of vulture) had been set up by the end of the year 2009–2010

Planned Breeding of Vultures

The Central Zoo Authority had already decided to establish four regional centres for vulture breeding to augment the efforts made for planned breeding of vultures by the BNHS at the Breeding Centre, Pinjore during 2003–2004. In pursuance of the said decision, amounts of Rs.62 lakhs each were released to set up centres at Hyderabad, Bhubaneswar, Junagarh and Bhopal. Three centres, namely Hyderabad, Junagarh and Bhopal, are already functional. The Bhubaneswar centre is under construction.

The Central Zoo Authority has also started providing financial grants to the Pinjore Centre for meeting both recurring and non-recurring costs. A workshop on the Vulture Conservation Breeding Programme was organized at Pinjore in 2006–2007 to orient zoo directors for vulture conservation.



Technical Support for Conservation Breeding

Provision of a biologist to monitor and supervise the breeding programme had also been made through sanctions of small grants to various zoos. The list of these zoos follows:

- 1) Reproductive biology and breeding of Wild Dog—Indira Gandhi Zoo, Vishakhapatnam
- 2) Reproductive biology and breeding of Indian Pangolin—Nandankanan Biological Park, Bhubaneswar
- 3) Reproductive biology and breeding of Red Panda—Padmaja Naidu Himalayan Zoological Park, Darjeeling
- 4) Reproductive biology and breeding of Clouded Leopard—Sepahijala Zoological Park, Agartala
- 5) Reproductive biology and breeding of Stump Tailed Macaque—Aizawl Zoo, Mizoram
- 6) Reproductive biology and breeding of Brow Antlered Deer—Alipore Zoo, Kolkata
- 7) To study Snow Leopard—Padmaja Naidu Himalayan Zoological Park, Darjeeling
- 8) Behavioural study for conservation breeding of Himalayan Black Bear—Padmaja Naidu Himalayan Zoological Park, Darjeeling

The Central Zoo Authority endeavoured to get the maximum number of founder animals possible for various species. DNA fingerprinting of the entire founder animal population was done to ascertain the genetic purity and level of heterozygosity. Markers were supplied to zoos, which are being implanted in all the animals. The planned breeding programmes are still in takeoff phase. Detailed breeding schemes for each species are yet to be developed. The Conservation Breeding Group of the Authority is engaged in the task. They have already held several meetings in different zoos.

The efforts have paid dividends. The names of the species whose populations have shown significant rises as an outcome of the planned breeding programme follow:

Sl. No.	Name of the Coordinating Zoo	Species	Population on 31/3/2013 (Male:Female:Unsexed=Total)
1	Sepahijala Zoological Park, Agartala	Clouded Leopard	4:3:6 = 13
2	Nehru Zoological Park, Hyderabad	Mouse Dear	14:21:0=35
3	Indira Gandhi Zoo, Vishakhapatnam	Wild Dogs	3:1:8=12
4	Manipur Zoo, Manipur	Sangai	4:10:3=17
5	Sakkerbaug Zoo, Junagarh	Wild Ass	8:3:11=22
6	Padmaja Naidu Himalayan Zoological Park, Darjeeling	Red Panda	8:5:1=14
7	Aizawl Zoo, Mizoram	Stumped Tailed Macaque	10:9:4=23
8	Itanagar Biological Park	Hoolock Giboon	10:5:-2=17

The planned breeding programmes are still in the take off phase. Detailed breeding schemes for each species are yet to be developed. The Conservation Breeding Group of the Central Zoo Authority is engaged in the task. The group has already held several meetings in different zoos.

(c) Improved Healthcare for Conservation Breeding Programme

Most of the zoos did not feel comfortable with the concept of regional referral centres. They felt that they could do better by having bilateral arrangements with the veterinary colleges in their own states. Therefore, the scheme of funding the referral centres was done away with. Zoos were asked to enter into bilateral agreements with the veterinary colleges of their choice. However, a decision was taken to strengthen the infrastructure at IVRI, Bareilly. Accordingly, a consultancy project was awarded to IVRI for advising Indian zoos on providing healthcare to zoo animals and finalizing standards, guidelines and protocols for disease diagnosis and curing wild animals in Indian zoos. Another consultancy project was given to IVRI for finalizing guidelines for animal nutrition and feeding. The institute continues to provide referral services to zoos under the first consultancy project. The two projects have been completed, and detailed protocols for providing healthcare to zoo animals and the nutrition and feeding of zoo animals have been published. The guidelines are proving to be useful tools for providing healthcare to zoo animals. Another consultancy was given to them for finalizing guidelines on animal nutrition and feeding. The institute continues to provide referral services to zoos under the first consultancy. The two projects have been completed and detailed protocols on health care of zoo animals and nutrition & feeding of zoo animals have been published. The guidelines are proving to be useful tools for healthcare of zoo animals.



(d) Record Keeping

Zoos have been maintaining their records since 1992 in the formats prescribed by the rules and guidelines notified by the Government of India. Somehow, these formats did not match with the format being used at the international level. Therefore, there was always some difficulty in coordinating with the international zoo community. To redress this problem, the Central Zoo Authority entered into a MoU with International Species Information System (ISIS), U.S.A.

1. Under the agreement, ISIS made available following the records software packages to 57 Indian zoos:
 - a) Animal Record Keeping System (ARKS)
 - b) Central Animal Global Database
 - c) Single Population Animal Records System (SPARS)
 - d) Medical Animal Record Keeping System (MedARKS)
2. ISIS will also provide training to Indian zoos on maintaining the global animal database.
3. Studbook software system that works with species– extracts of the data and the existing stud books.

ISIS has been paid US\$3,19,992 as one time financial assistance. An annual consultant fee of US\$63,998 will be paid for 5 years. Under this programme, ISIS has organized meetings at the regional level as follows:

Sl. No.	Place	Date	Regions
1	Pune	2nd to 6th Dec 2008	Southern and Western
2	Bhubaneswar	16th to 21st Jan 2009	Eastern and North-Eastern
3	Chandigarh	10th to 15th Feb 2009	Northern and Central

Zoo Directors and Zoo biologist/record keepers participated in the workshop. The logistics for the workshops were provided by the local zoos. For this 38.72 lakhs was released by the Authority. The programme helped zoos in planned exchange and health care of zoo animals also.

(e) Maintenance of Studbooks

The Central Zoo Authority has entered into an agreement with the Wildlife Institute of India to maintain studbooks of all endangered species of wild animals housed at various zoos. The institute has already brought out studbooks for the Rhino, Asiatic Lion, Bengal Tiger, Clouded Leopard, Grey Peacock Pheasant, Hoolock Gibbon, Gaur, Nilgiri Langur, Red Panda, Wild Ass, Wild Dog and Snow Leopard. The studbooks provide detailed information on the behavior and biology of the species and will be quite useful for zoo directors for managing these species in captivity..

CORE FUNCTIONS OF THE CENTRAL ZOO AUTHORITY:

Besides the new initiatives mentioned in the foregoing, the Central Zoo Authority continued to carry out the core functions assigned to it. A summary of the progress made in respect of the various functions follows:

(1) Evaluation and Grant of Recognition to Zoos

Periodic evaluation of zoos was done by the Central Zoo Authority through teams of experts, and recognition was granted to them, including rescue centres and circuses. The number of recognized zoos and circuses at the end of 2009–2010 was as follows:

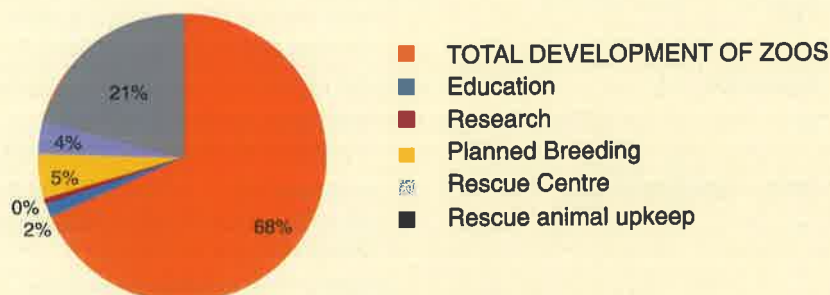
Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.	Zoos with area more than 50 Ha.
36	24	29	23	42	17	23	194

Funding for development of zoos:

While all these activities were taking place, CZA made every effort for planned development of zoos and upgrading the technical skills. The grant released by the Central Zoo Authority for planned development of zoos from the year 2004-2005 to 2009-2010 (Rs in lakh) is as follows:

Financial Year	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Enclosure Construction and Improvement	848.75	771.68	1058.75	555.57	662.76	622.67	4520.18
Veterinary Care	86.49	43.61	114.41	43.70	74.27	109.30	471.78
Store and kitchen	27.90	9.10	1.30	12.00			50.30
Sanitation & Hygiene	129.10	44.75	53.28	21.13	10.00	4.61	262.87
Water body	58.00	86.72	128.76	79.92	15.40		368.80
Boundary wall	146.24	32.35	54.66	136.89	48.00	2.50	420.64
Road and Path	15.00		6.50	24.43	16.37	161.78	224.08
Miscellaneous		34.59	5.00		41.30	13.29	94.48
TOTAL DEVELOPMENTAL COST OF ZOOS	1311.48	1022.80	1422.66	873.64	868.10	914.15	6413.13
Education	2.00	4.08	45.05	73.91		20.40	145.44
Research					12.55	33.06	45.61
Planned Breeding	7.50	64.53	69.70	169.44	158.66	6.44	476.27
Rescue Center	140.24	133.70	26.00	32.53			332.47
Rescue animal upkeep	216.16	282.56	279.38	362.59	351.60	466.02	1958.31
Total	1677.38	1507.67	1842.79	1512.11	1390.91	1440.07	9370.93

ITEM WISE BREAK UP OF GRANTS RELEASED:



2) RESCUE FACILITIES AND UPKEEP OF RESCUED ANIMALS:

Funds were provided by the Central Zoo Authority for the upkeep and provision of healthcare for circus animals housed at the seven rescue centres created at Arignar Anna Zoological Park, Bannerghatta Biological Park, Sri Venkateswara Zoological Park, Indra Gandhi Biological Park and the Nahargarh Zoological Park.[Only five of the seven centres are listed. Please check.] However, over the years it was felt that there was a dearth of space for free movement and exercise of animals at some of the centres. Therefore additional housing facilities were created for Tigers and Lions at Sri Venkateswara Zoological Park, Tirupati and Indra Gandhi Biological Park, Vishakhapatnam. To supplement the accommodation, a further 30 Lion enclosures, 20 Tiger enclosures and 17 Leopard enclosures were constructed at Van Vihar National Park Bhopal. At this point of time, the human-animal conflict had assumed serious dimensions in Madhya Pradesh. The facilities proved to be quite handy in housing the problem animals captured from the wild.

The Central Zoo Authority provided financial assistance to the West Bengal Government to set up a rescue centre for Tigers and Panthers at South Khairabari. Some circus Tigers were accommodated there also. It was ensured that all the circus animals housed in the rescue centres spent a quality life there and the financial constraints in no way adversely affected this.

ZOOS THAT ARE MAJOR RECEIPIENTS OF THE GRANTS FROM THE AUTHORITY:

Sl. No.	Name of Zoo	Major work done
1	National Zoological park	Up gradation of animal enclosures, Improvement of Drainage, Security wall
2	Nandankanan Zoo	Up-gradation of animal enclosure, security wall, water supply, conservation breeding facilities
3	Biological Park, Itanagar	Up gradations of animal enclosures, Improvement of health care facilities, water supply and conservation breeding facilities

4	Arignar Anna Zoological Park	Up gradation of animal enclosure, Improvement of health care facilities, Conservation breeding, carpeting of roads
5	Aizawl Zoo	Animal enclosures, soil conservation measures, boundary wall and improvement of health care facilities
6	Nehru Zoological Park	Improvement of animal enclosures, improvement of health care upkeep infrastructure & Dr.ainage, Conservation breeding facilities
7	Rajiv Gandhi Biological Park, Pune	Animal enclosures and other animal upkeep infrastructure
8	Padmaja Naidu Himalayan Zoological Park	Security wall, animal enclosures and up-gradation of healthcare facilities and research
9	Nagaland Zoological Park, Rangapahar	Security wall, animal enclosures
10	Kamala Nehru Zoo, Indore	Animal enclosures and other animal upkeep infrastructure
11	M.C. Zoological Park, Chhatbir	Animal enclosures, up-gradation of health care facilities, up-gradation of security wall, Conservation breeding
12	Sri Venkateswara Zoological Park, Tirupati	Animal enclosure and other animal upkeep facilities
13	Mahatma Gandhi Zoo,	Animal enclosures and health care facilities
14	Assam State Zoo, Guwahati	Animal enclosures, water supply, security wall, improvement of Dr.ainage
15	Shyaji baug Zoo, VadoDr.a	Animal enclosures and other zoo facilities
16	Sri ChamrajenDr.a Zoo, Mysore	Animal enclosures, health care facilities and augmentation and recycling of water supply
17	Biological Park, Nahargarh	Animal enclosures and other animal upkeep –health care facilities
18	Tiger Safari Shimoga	Construction of lion and tiger safari and other animal enclosures

19	Bhagwan Birsa Biological Park, Ranchi	Animal enclosures, water supply and improvement of Drainage
20	Sakkarbaug Zoo, Junagarh breeding and health care facilities	Animal enclosures, conservation
21	Thiruvanthapuram Zoo	Animal enclosures and other support infrastructure
22	Himalayan Zoological Park, Bulbuley	Security wall and animal enclosures

3) SCIENTIFIC STUDIES AND RESEARCH:

With a view to develop of better standards in respect of various operations pertaining to zoo management, the authority awarded projects on various aspects of zoo management to eminent institutions of the country. The list of these projects is given under:

Sl. No.	Project Title	Project Cost	Stage of the Project
1	Developing Guidelines on Principles of Zoo Designing for Zoos in India-School of Planning and Architecture, New Delhi	Rs 23.14 lakh	Running
2	Developing Master Education Plan for Zoos of India-Center for Environment for Education, Ahmadabad	Rs 17.26 lakh	Concluded. Report circulated to zoos follow up action
3	Studies on animal housing and enclosure enrichment for some species in selected zoos-Wildlife Institute of India, Dehradun	Rs 38.72 lakh	Likely to be concluded in few months time
4	Common foot ailments in captive Asiatic Elephant	Rs 5.94 lakh	Concluded .Findings circulated to zoos

In addition to these projects small grant studies were awarded to different zoos on different zoo management issues. The brief resume of the projects is given below:

Sl. No.	Project Title	Project Cost	Stage of the Project
1	Ectoparasites of zoo animals and birds Nandankanan Zoo	Rs.6.00 lakh	Concluded. Report - circulated to zoos for information and follow
2	Development of Guidelines for upkeep of reptiles in zoos & parks in India-RajivGandhi Zoological Park, Pune	Rs. 3.70 lakh	Concluded. Report circulated to zoos for follow up action
3	Preparation of a manual on transportation of zoo animals-National Zoological Park, New Delhi	Rs.1.57 lakh	Concluded .Guidelines on transportation of animals issued

4	Population Control Measures on prolifically breeding species- Arignar Anna Zoo	Rs.6.70 lakh	Concluded. Findings shared with zoos
5	Prepare Model Disaster Management Plan for Indian Zoos – Kanpur Zoological Park, Kanpur	Rs.3.50 lakh	-Do-
6	Record Keeping in Zoos-Padmaja Naidu Himalayan Zoological Park, Darjeeling	Rs.4.03 lakh	Concluded. Findings shared with other zoos
7	Standard Protocol for maintaining Live feed for Zoo Animals-Sri ChamrajenDr.a Zoo, Mysore	Rs.2.00 lakh received	Findings are yet to be

4) TECHNICAL PUBLICATIONS:

To help zoos with the day-to-day management of zoos, particularly providing zoo animals with quality upkeep and health care and designing animal enclosures properly, these books/manuals were published by the Central Zoo Authority:

1. Coloured Atlas on Parasites of Wild Animals-authored by Dr. Jay Thangrajan, Madras Veterinary College
2. Zoo Planning: Design and Land Landscape Architecture—School of Planning and Architecture
3. Barrier Designs for Zoos—authored by Dr. Brij Kishor Gupta
4. Zoos of India: Legislative Policy, Guidelines and Strategy—Central Zoo Authority
5. Zoos of India—authored by Dr. J.H. Desai and Dr. A.K. Malhotra
6. A Manual of Transport Cages and Nest Boxes—Central Zoo Authority
7. Master Education Plan for Indian Zoos—Centre for Environment Education, Ahmedabad
8. Guidelines for Establishment and Scientific Management of Zoos in India-Central Zoo Authority

(5) UPGRADING THE TECHNICAL SKILLS OF ZOO PERSONNEL

a) Zoo Supervisors training:

In view of the fact that the zoo directors were finding it difficult to be away from their zoos for 2 weeks at a time, the Central Zoo Authority decided to do away with the 2 week capsule courses for zoo directors. However, the 2 week training programmes for zoo supervisors were continued. Details of the courses organized from 2005-2006 to 2008-2009 are given here:

Sl. No.	Year	Venue	Course Organizer	Focus of the Course
1	2005-06	New Delhi	Wildlife Institute of India	Scientific management of zoos
2	2006-07	Arignar Anna Zoological Park, Chennai	Wildlife Institute of India	Zoo Education and Conservation Breeding
3	2007-2008	Ahmedabad	Center of Environment Education	Zoo marketing and Zoo education
4	2008-09	Dehradun	Wildlife Institute of India	Up Keep of Animals in Zoos

b) Training programmes for zoo veterinary staff:

- 1) One week training programmes were organized for the zoo veterinarians during the year 2006-07 and 2008-09 at Indian Veterinary Research Institute, Bareilly.
- 2) One week training programme was organized for Laboratory Assistants and Compounders at Forest Academy Dulapay, Hyderabad in collaboration with Nehru Zoological Park.

c) Zoo Keepers' training:

Two week training programmes were organized for zoo keepers on the general principles of zoo management, particularly sanitation, hygiene and handling of animals as per details given below:

Sl.No.	Year	Venue	Remark
1	2004-05	Kanpur Zoological Park Nandankanan Biological park, Bhubaneswar Arignar Anna Zoological Park Kamla Nehru Zoological Park, Ahmedabad Assam State Zoo, Guwahati	Total 135 Zoo Keepers were trained
2	2005-06	Kanpur Zoological Park Sri Chamrajen Dr. a Zoo, Mysore Assam State Zoo, Guwahati Nandankanan Biological park, Bhubaneswar	Total 125 Zoo Keepers were trained
3	2006-07	Kanpur Zoological Park Kamla Nehru Zoological Park, Sri Chamrajen Dr. a Zoo, Mysore Nandankanan Zoological Park, Bhubaneswar.	More than 125 Zoo Keepers were trained

4	2007-08	Thiruvanthapuram Zoo M.C. Zoological Park, Chhatbir Rajiv Gandhi Biological Park, Pune Assam State Zoo, Guwahati Arignar Anna Zoological Park Van Vihar Bhopal	Total 153 Zoo Keepers were trained
5	2008-09	Prince Of Wales Zoological Park, Lucknow Bilaspur, Chhattishgarh	About 40 keepers were trained
6	2009-10	Assam State Zoo, Guwahati Rajiv Gandhi Biological Park, Pune MaDr.as Crocodile Bank Prince of Wales Zoological Park	About 100 keepers trained on Management of Reptiles in Captivity

A special training programme was organized for the keepers of high altitude zoos at Padmaja Naidu Zoological Park, Darjeeling in 2006–2007 and a programme on animal nutrition was organized at Arignar Anna Zoological Park, Chennai (2008–2009).

(d) International Exposure and Training

To provide zoo directors and zoo veterinarians with international exposure, the practice of deputing one zoo director and one zoo veterinarian to the 3 week training programme on conservation at Jersey Wildlife Preservation Trust, U.K. continued, and the following officers were trained there:

Sl.No.	Year	Name	Position
1	2004-05	Mr. S.K.Sinha Dr. Anil Sharma	Director, Nandankanan, Zoo Veterinary Officer, Van Vihar Zoo
2	2005-06	Dr. Kuldeep Kumar Lomis Dr. C.S.Jaykumar	Director M.C. Zoological Park, Chatbir Veterinary Officer, Thiruvanthapuram Zoo
3	2006-07	Mr D.N.Singh Dr. Jikom Panor	Director National Zoo, Delhi Veterinary Officer, Biological Park Itanagar
4	2007-08	Mr K.C.Pillai Dr. Vanlahhuria	Director, Venkateshwar Zoological Park, Tirupati Veterinary Officer, Aizwal Zoo, Mizoram
5	2008-09	Mr Vijay Ranjan Dr. Thirumurgan	Director Sri Chamrajen Dr. a Zoological Park Mysore Asst. Vet. Surgeon, Arignar Anna Zoological Park
6	2009-10	Mr Rahul Bhatnagar Dr. Atul Gupta	Dy Chief Wildlife Warden and in charge Udaipur Zoo Veterinary Officer, Van Vihar Zoological Park, Bhopal

(f) Workshops for Zoo Directors and Zoo Veterinarians

Sl.No.	Year	Subject	Venue	Objective of the Workshop
1	2004-05	Regional Workshop for Zoo Vets on Conservation Breeding	Alipore Zoo, Calcutta	Strategy for Conservation Breeding of Endangered Species of East and North Eastern Region
2	2005-06	Zoo Veterinarians Workshop –National Coordinated Health Programme for Zoo Animals	Guwahati	Work out the mechanism for utilizing specialized facilities available at Veterinary Institutions for improved health care of zoo animals
3	2006-07	One Week Workshop on preparation of Theme Based Master Plans for Zoos	Bhubaneswar	To Sensitize Zoo Personne about the Modern Concepts of master planning through professional inputs from John Co and Bernard Harrison
4	2007-08	Workshop & International Workshop on "Indian Initiatives on Conservation Breeding"	Delhi	Strategy on Planned Breeding for birds, reptiles and both herbivorous and carnivorous mammals
5	2008-09	Workshop on Conservation Breeding of Endangered Species of Pheasants of India	Padmaja Naidu Himalayan Zoological Park, Darjeeling	125th anniversary of the zoo

(g) Other Workshops and Training Programmes

Sl.No.	Year	Title of workshop	Venue	Name of the organizer
1	2006-07	Vulture Conservation Breeding Programme	Pinjore	Vulture Rescue and Breeding Center
2	2007-08	Making Zoo Education Sustainable with special reference to Zoo Marketing and Fund Raising	Ahmadabad	Center for Environment Education
3	2008-09	In-situ & Ex-Situ Conservation of Amphibians	Mysore	Sri Chamarajendra Zoo

Selected zoo directors and zoo personnel also attended workshops organized by other organizations, namely the SAZARK meeting at Ahmedabad (2007–2008) and the Conference on Conservation of Amphibians in Kerala (2007–2008).

6. INTERNATIONAL COOPERATION

- a) The Central Zoo Authority has, since its very inception, been an active member of the World Association of Zoos and Aquariums. It has been pleading for having one of the annual meetings of the association in India. This long cherished desire was fulfilled, and a decision was taken by the association to have its annual meeting at Delhi in 2014.

- b) The Central Zoo Authority has always been held in high esteem by the Conservation Breeding Group of the IUCN. The Central Zoo Authority has been adopted as a member of the executive council of the group. To reciprocate the gesture, the Central Zoo Authority has become a Protector Member of the group after paying the requisite fee.
- c) The ISIS (International Species Information System) has been actively associated with upgrading the animal records of Indian zoos that have joined the organization as its members. Keeping in mind the large volume of work to be handled by ISIS in India, the Central Zoo Authority has been co-opted as its trustee.

PROACTIVE ACTION FOR CONSOLIDATION OF THE GAINS (2010–2011 TO DATE) - ensuring hire standards of animal welfare & ex-situ conservation

The proactive initiatives taken are bound to have far reaching results in improving the housing, animal upkeep, provision of health care and building up of self-sustaining populations of physically, behaviourally and genetically healthy animals. However effective execution of the programmes adopted on the ground in 156 zoos and 17 rescue centres was a real challenge, particularly in view of the fact that the majority of the zoos hardly had technically qualified staff. The problem was compounded by the fact that even the zoos which had technically qualified personnel more interested in number of species than the quality of display and education value of the display. Under these circumstances, the Central Zoo Authority had to adopt a multipronged approach to get the targeted results. On one hand repeated training programmes were organized for all levels of personnel including zoo architects on different aspects of zoo management and planning of zoos. On the other hand, teams of experts were sent to the field to help the zoo personnel identify the major inadequacies and bottlenecks plaguing the management and suggest strategies for addressing the same. The experts apprised the zoo personnel about modern concepts of zoo designing, population management and education and interpretation tools. Financial incentives for good work also continued to be the major persuasive tool. A summary of the progress made on different action points is provided here:

(1) PREPARATION OF LONG TERM MASTER PLAN FOR ZOOS

Preparing the master plan of a zoo is quite a specialized and painstaking exercise that requires both in-depth knowledge about various aspects of zoo management and exposure to modern concepts of zoo designing, landscaping and zoo education. Somehow, zoo personnel and architects hardly have the right aptitude and the necessary skills to prepare master plans that can lead to planned development of zoos to accomplish the desired objectives of mustering public support for national conservation efforts and helping in ex-situ conservation of endangered species of wild animal. The 1 week training programme for zoo directors at Bhubaneswar was a good beginning in the direction of providing zoo directors an exposure to the detailed procedure of master planning for planned development of zoos. To further upgrade their skills in this regard, a workshop, "Land Landscape Planning and Zoo Designing", was organized at Hyderabad in November 2011, with Jon Coe, of Jon Coe Designs Pvt. Ltd., from Australia, as a subject matter specialist and with supporting presentations from the members of the Expert Group on Zoo Designing. There were interactive sessions between the zoo directors of major zoos and Jon Coe on the first two days of the workshop. The directors also had a hands-on field exercise at

Nehru Zoological Park in landscaping the zoo enclosures in manner congenial to the wild animals housed therein.

On the last day of the workshop the directors all categories were present and presentations were made on the procedural details about preparing the master-plan of zoo. As the inputs of the architect are most crucial for preparing a good master plan a workshop on "Zoo Designing and Landscape Architecture



Nature Immersing enclosure

was organized at School of Planning & Architecture, Delhi in February 2012 for the architects interested in the subject Jon Coe was the principal speaker on the workshop. He was ably supported by Ms. Monica Fiby founder of the Zoolex Zoo Designs Organization. Both the speakers dealt n length with the peculiarities of Zoo Designing and Innovative methods of Zoo Interpretation. The Workshop was also followed by a

hand on field exercise at National Zoological Park, Delhi about landscaping and environmental enrichment in various sections of the zoo.



Despite all the educative and persuasive measures, the process of getting master plans of the desired quality was a painfully slow process. The plans submitted by the zoos had to be returned to the zoos

several times to incorporate the suggestions of the Expert Group. To cut short this prolonged procedure, the Member Secretary of the Central Zoo Authority and the Convener of the Expert Group initiated the process of finalizing the master layout plan and the collection plan during the field inspection itself and advised the zoo personnel about designing and planning of zoos again, with Jon Coe as the principal presenter and Monica Fiby the supporting presenter. They dealt at length with the peculiarities of zoo designing and innovative methods of zoo interpretation. This workshop was also followed by a hands-on field exercise at various sections of National Zoological Park, Delhi on landscaping and environmental enrichment. Both the workshops have been quite useful in upgrading the master planning skills of the zoo directors and zoo architects of the country.

EXPERT GROUP ON ZOO DESIGNING

To enable zoo directors to prepare master plans of zoos in a time-bound and professional manner, the Central Zoo Authority reconstituted the Expert Group on Designing with 12 members, i.e. four architects, four ex-zoo directors and four zoo educationists/enlightened zoo enthusiasts, and the Member Secretary as the Convener. The Expert Group was divided into four sub-groups, each comprising one ex-zoo director, one zoo architect and one educationist/enlightened zoo enthusiast, and each sub-group was given the responsibility of getting the master plans of each region expeditiously prepared, scrutinizing the same and getting it submitted to the Central Zoo Authority at the earliest. The group was also authorized to visit the concerned zoos and get the preliminary master layout plan and collection plan prepared at the time of inspection of the zoo. The Member Secretary himself demonstrated how this could be done by taking a lead in the matter. At every opportunity when he met zoo directors, he impressed upon them the need for expeditious submission of the master plans. Despite all the persuasion, the progress made in the direction of submission and approval of the master plans was quite tardy in view of the fact that a large number of zoos did not have even a full-time officer in charge of the zoo. Where appropriate officers were available, they were responsible for overseeing the operation of other zoos and hardly had the time to give due priority to the preparation of the master plans. There is no denying the fact that in the interest of getting the master plans of the expected quality, the plans submitted by the zoos had to be moved back and forth several times to incorporate the suggestions of the Expert Group. With the objective of not letting delays in approval of the master plans hinder the process of development of the zoos, the Central Zoo Authority requested the members of the Expert Group to ensure that the master layout plans and the collection plans of all the major zoos were approved at the earliest. In many cases these were finalized at meetings of the Expert Group themselves. In many cases, master plans that had been approved had to be revisited and suitably amended. These measures have helped improve the situation slightly. The present position regarding the approval of master plans and master layout plans is summarized here:

Sl. No.	Zoo Category	Total number of zoos	Number of Zoos that have approved Master Plan	Number of Zoos, that have approved Master (Layout) Planned Collection Plan
1	Large Zoos	11	9	2
2	Medium Zoos	27	10	15
3	Small Zoos	36	3	16
4	Mini Zoos	81	5	20
5	Rescue Center	15	8	1
	Total	170	35	54

*The master plans of two large zoos are in the final stage of approval.

*Most of the zoos where no approvals have been obtained, by and large, do not have full-time officers in charge of the zoo. The master plans of one medium and two small zoos are held up due to non-finalization of new sites.

2) PLANNED BREEDING OF ENDANGERED SPECIES OF WILD ANIMALS:

The Central Zoo Authority, with the objective of effective steering of conservation breeding programmes, formed a group of experts in conservation breeding in 2010. This group, in its meeting held on August 2010, adopted the following policy and guidelines for carrying out conservation breeding in Indian zoos:

The guidelines and the funding mechanism adopted by the Conservation Breeding Group were accepted by the Technical Committee of the Central Zoo Authority and have been followed when releasing financial assistance for conservation breeding programmes of species on the priority list given under.

NORMS FOR ESTABLISHMENT OF CONSERVATION BREEDING PROGRAMMES AND FUNDING THERE OF

The group identified 73 species for the Conservation Breeding Programme in Indian Zoos (72 species identified earlier), of which 36 species were identified as priority species. The group, however, recommended that the final list of priority species should be prepared on the basis of field data and scientific data.

The group adopted the following guidelines for implementing the conservation breeding programme:

1. Each species identified for conservation breeding (CB) should have a recovery plan for each species and must decide right from the onset of programme as to how many number of founder animals required for the programme. The continuity of the staff (especially the project manager) and adequate funds must be ensured for the success of the programme.
2. Each CBP should have linkage with in-situ conservation programme. Scientific partnership with institution in each programme has to be ensured to provide latest input & finding of research.



Approved norms for establishment of conservation breeding programme and funding procedure

The group discussed strategies for planned breeding of 72 + 1 (Rusty Spotted Cat) species identified by the Central Zoo Authority for conservation breeding.

(1) Eligibility:

Coordinating zoos that have been identified for a species will be eligible for receiving financial assistance from the Central Zoo Authority for establishing an off-display conservation breeding centre (CBC) and the participating zoos will get assistance for improving the existing enclosure.

(2) Pattern of funding:

The Central Zoo Authority will provide 100% financial assistance to coordinating zoos and to participating zoos for improving existing enclosures.

(a) Coordinating zoos

The coordinating zoo shall create a housing facility as per the design approved by the Central Zoo Authority in the off-display area of the CBC. It was decided that the Central Zoo Authority shall provide 100% funding for establishment of the facility. The maintenance of the off-display CBC will also be funded, subject to the availability of funds with the Central Zoo Authority at that point of time. The following items may be considered by the Central Zoo Authority when providing funds to zoos or states under the CBP:

(i) Non-recurring

- Construction of off-display enclosures including feeding/retiring cell, kraal, paddock (herbivores), water facility, approach road or service path, power fencing, animal kitchen, store, enrichment artifacts, etc.
- Fencing around the CBC
- Material for marking animals (radio transponders and applicator, receiver, leg bands and applicator, and ear tags and applicator)
- Construction of project office if required
- Animal quarantine or isolation ward (away from zoo/CBC)
- Squeeze cage and transportation cages or box as needed
- Treatment kits, medicines and tranquilizing equipment
- Kitchen utensils and food storage facility (freezer)
- Computer, printer and UPS

(ii) Recurring

Financial assistance to CBCs will be made in project mode by the Central Zoo Authority for the following expenses, depending on the availability of funds:

- Hiring of a biologist (one number)
- Hiring of a veterinary assistant (one number)
- Hiring of a keeper (one number)
- Food (subject to the availability of funds)
- Medicines and tranquilizing drugs.
- Photos, printing, publication of reports, etc.
- Maintenance, cleaning and sanitation of enclosures and surrounding areas
- Annual maintenance of water, electricity, paints, etc.[Please check this item. Edit to 'water and electric supply systems, painting, etc.'?]
- Stationery items

(b) Participating zoos

(i) Non-recurring

- Improvement of existing display enclosures including feeding/retiring cell, kraal, feeding shed, water facilities, power fencing, kitchen, store, enrichment artefacts, etc.
- Material for marking animals (radio transponders and applicator, receiver, leg bands and applicator, and ear tags and applicator)
- Improvement of animal quarantine or isolation ward

(C) Initiation and duration of the project

The project shall be considered initially for a period of 5 years for each species with a yearly break-up of activities. The project description should be submitted to the Central Zoo Authority through the Chief Wildlife Warden of the concerned state.

Note: Zoos in which a CBC has already taken off (construction of enclosures, etc.) should also initiate a proposal, i.e. preparation of project for 5 years.

(d) This is the sequence of steps to be adopted for conservation breeding as per the guidelines issued:

- Identification of founders
- Marking of founders (transponders, ear tags or rings)
- Preparation of animal history sheets and animal observation sheets of the identified founders by the zoos

- Preparation of National Stud Bbook by the National Stud Bbook Keeper
- Liaison with the International Studbook Keeper of the species (if any)
- Investigation of the Ppossibility of acquiring the founders from foreign zoos (if required) and obtaining details of the zoos from where which founders can be acquired
- Conducting Pphysical health check-ups of the founders using the veterinary hospital in the Zzoo as well as the Nnational Rreferral Ccentre (Indian Veterinary Research Institute, Bareilly)
- Genetic health check-ups of the founders using blood samples or body parts with help from LaCONES, Hyderabad
- Engagement of Technical Assistants (Biologists, Veterinary assistants, etc.) at the Coordinating Zoo.

Note: A zoo where a CBC has already been launched (by constructing enclosures, etc.) should ensure that all these steps are followed and complied with.

(e) Staff pattern

The Central Zoo Authority will provide funds for hiring a biologist, a veterinarian or veterinary assistant and a keeper. The remaining supervisory or additional staff have to be matched['funded'] by the concerned zoo or state government.

(f) Release of funds

Annual release of funds will be made as follows:

- (i) 50% of the approved grant as the first instalment
- (ii) 30% of the approved grant as the second instalment
- (iii) 20% of the approved grant as the last instalment

All CBCs should submit half-yearly progress reports to the Central Zoo Authority. Further releases of grants will be subject to the appraisal of the reports and submission of utilization certificates for the release funds. The Central Zoo Authority shall carry out mid-term evaluation of the CBPs of the concerned species from time to time.

(g) Collaboration with institution:

Concerned zoo should collaborate with Wildlife Institute of India, Indian Veterinary Research Institute Bareilly, and Laboratory for Conservation of Endangered Species (LaCONES), CCMB and Bombay Natural History Society etc. to carry out the studies efficiently in order to achieve the objectives.

(h) Priority of species for funding the project

As the Central Zoo Authority has been enduring to provide financial support to zoos in addition to its main functions i.e. technical and other support, this will depend on the availability of funds. However, to begin with, the following priority has been decided.

(i) Species for which off-display breeding facilities have been created

(ii) Remaining species from the priority list of 35 species + 1 species (Rusty Spotted Cat)

List of the endangered wild animal species PRIORITIZED for the Coordinated Conservation Breeding including details of the coordinating zoos, participating zoos and the number of animals of the species in captivity in India:

Follow Up Measures:

As desired by the Conservation Breeding Group the Central Zoo Authority gave a project to the Wildlife Institute Of India to prepare a list of priority list of species for taking up the conservation breeding, on the basis of available field data and scientific data. Of the 25 priority species identified by the institute, the names of the species that are common in the priority list prepared by the group and the institute, that are not included in the priority list prepared by the group are listed below along with species that are part of the list prepared by the Group but are not part of the priority list prepared by the institute:-

Sl. No.	The species which are part of both the priority list (prepared by WII)	Species that are part of the priority list prepared by the Institute but not of the list prepared by the group	Species that are part of the priority list prepared by the group but are not part of the list of the Institute
1	Pygmy Hog (<i>Sus salvinus</i>)	1. Pharys leaf monkey (<i>Trachypithecus phayrei</i>)	1 Mouse deer (<i>Tragus memmina</i>)
2	Vultures (white backed, long billed, Slender billed)	2. Nilgiri Langur (<i>Semnopithecus Johnii</i>)	2 Indian Pangolin (<i>Manis crassicaudata</i>)
3	Hangul (<i>Cervus hanglu</i>)	3 Bengal lesser florican	3 Himalayan Monal (<i>Lophophorus impejanus</i>)
4	Golden Langur (<i>Trachypithecus gee</i>)	4 Hard ground Swamp deer	4 Grey jungle fowl (<i>Gallus sonnerati</i>)
5	Wild Buffalo (<i>Bubalus bubalis</i>)		5 Shaheen falcon (<i>Falco peregrinus</i>)
6	Brow antlered deer (<i>Cervus eldi</i>)		6 King Cobra
7	Lion tailed Macaque (<i>Macaca Silenus</i>)		7 Red jungle fowl (<i>Gallus gallus</i>)
8	Red panda (<i>Ailurus fulgens</i>)		8 Chinkara (<i>Gazella bannetii</i>)
9	Blyth tragopan (<i>Tragopan blythii</i>)		9 Hume's pheasants (<i>Syrmaticus humiae humaie</i>)
10	Asiatic lion (<i>Panthera leo</i>)		10. Blue sheep (<i>Pseudois nayur</i>)
11	Indian Rhinoceros (<i>Rhinoceros unicornis</i>)		11 Himalayan Salamander (<i>Tyletrotiton verrucosus</i>)

12	Western tragopan (<i>Tragopan melanocephalus</i>)		12. Swamp deer (<i>Cervus duvauceli duvauceli</i>)
13	Great Indian Bustard		13 Rusty spotted cat
14	Wild ass (<i>Equus hemionous khur</i>)		
15	Musk deer (<i>Moschus chrysogaster</i>)		
16	Hoolock gibbon (<i>Hoolock leuconedys</i>)		
17	Nilgiri tahar (<i>Nilgiritragus hylocrius</i>)		
18	Cheer Pheasant (<i>Catreus wallachi</i>)		
19	Clouded leopard (<i>Panthera nebullosa</i>)		
20	Painted roof turtle (<i>Kachuga kachuga</i>)		
21	Snow leopard (<i>Panthera uncia</i>)		

* of the 40 species listed in the table (including three vulture species), for five species, namely the Nilgiri Tahr, Great Indian Bustard, Wild Buffalo, Bengal Florican and Shaheen Falcon, either founder animals are not available for a breeding programme or a suitable zoo has not been identified.

** In addition to the remaining 35 species, programmes for breeding the Serow, Golden Cat, Stump Tailed Macaque, Pig Tailed Macaque, Tibetan Wolf, Satyr Tragopan, Binturong, Four Horned Antelope and Brown Bear are also being technically supported by the Central Zoo Authority.

*** Thus, in all, CBPs of 45 species are to be implemented on priority basis. Off-display conservation facilities were available for 23 species at the time of the meeting of the Conservation Breeding Group in 2010. Since then, off-display conservation facilities have been established for 13 species.

1. Creation of New Breeding Centres

Sl. No.	NAME OF THE SPECIES	NAME OF THE ZOO	LOCATION	ESTABLISHMENT COST RS. IN LAKHS
1	Red Panda	Padmaja Naidu Himalayan Zoological Park	Topkedara	215.18
2	Snow leopard	-do-	-do-	
3	Blue sheep	-do-	Dowhill	96.83
4	Satyr tragopan	-do-	-do-	
5	Himalayn salamander	-do-	Zoo Campus	7.28
6	Binturong	Sipahijhala zoo	Zoo campus	153.26
7	Pig tailed macaque	-do-	-do-	
8	Pharys leaf monkey	-do-	-do-	
9	Blyth tragopan	Nagaland State Zoo	Kohima	42.10
10	Hangul	Shere Kashmir Zoo,	Srinagar	22.00
11	Indian Rhinoceros	Assam State Zoo	Zoo campus	118.00
12	Hard ground	Van Vihar Zoo, Bhopal Swamp deer	Bhopal	Under Planning
13	Golden langur	Assam State Zoo, Assam	Guwahati	54.18

2. Upgrading and Maintenance of Existing Breeding Centres

A. Non-recurring

- (1) The capacity of the Hoolock Gibbon Breeding Centre at Biological Park, Itanagar has been increased to accommodate the growing population of Hoolock Gibbons at an approximate cost of Rs.62 lakhs.
- (2) The regional vulture breeding centre at Nadankanan Zoo [Please provide the missing text here.]at an approximate cost Rs.64 lakhs. In addition, a sum of Rs.26 Lakhs was released for equipping the breeding centre.
- (3) A grant of Rs.26.70 lakhs [Edit OK?]was released to Van Vihar National Park and Zoo, Bhopal for establishing an additional colony aviary at the Vulture Conservation Breeding Centre.
- (4) A grant of Rs.60.20 lakhs was realeased for upgrading the Clouded Leopard breeding centre at Sepahijala Zoological Park

B. Recurring

An amount of approximately Rs.50 lakhs has been released to various CBCs for the following activities:

- (1) Salaries of veterinarians, biologists, keepers, etc.
- (2) Feeding costs of animals under the breeding programme

(3) Healthcare and general upkeep of the breeding centres

(3) TECHNICAL SUPPORT

The Central Zoo Authority has also been providing the zoos concerned the salaries of a biologist, veterinarians and one animal keeper to carry out the breeding programmes of various species in a planned and scientific manner. The costs of procuring and installing new equipment have also been reimbursed regularly to the new zoos. In special cases the cost of feeding the captive bred animals has also been provided under the programme.

The following workshops were also organized by the Central Zoo Authority to upgrade the technical skills of zoo personnel in planned breeding of endangered species:

- 1) Biologist workshop, "Management of Endangered Species", at Bhubaneswar in July 2010
- 2) Regional workshops, "Management of Birds in Captivity with Special Reference to Pheasants" were organized at Sarhan, Guwahati, Ahmedabad and Mysore during 2010–2011.
- 3) Regional workshops, "Management of Carnivores in Captivity", for zoo keepers at Tirupati, Sakkarbaug, Sepahijala and Nandankanan Zoo during 2011–2012
- 4) A workshop, "Endangered Species Recovery", was organized through Durrell Conservation Academy for zoo vets and zoo directors at Padmaja Naidu Himalayan Zoological Park, Darjeeling during 2012–2013.
- 5) PHVA for Red Panda was organized at Siliguri in collaboration with CBSG during 2013–2014.
- 6) A regional declaration on South Asia's critically endangered vulture species was made at a symposium held at Delhi on 4 May 2012. A detailed strategy for conservation of three critically endangered vulture species was adopted at the symposium. The strategy emphasized the need for setting up vulture conservation breeding centres in Pakistan, Nepal and India, imposing a ban on the use of veterinary diclofenac in all the three countries and promoting research and monitoring of the vulture population. The participants at the symposium appreciated the good work done in this regard and highlighted the need for further intensifying these efforts.

All these efforts have been quite useful in furtherance the cause of Planned Breeding of Endangered Species. Populations of quite a few species in Coordinating Species have shown an increasing trend. Brief resume of the inventory of these species is as follows:

Sl. No.	Name of the zoo	Name of the species	Population on 1-4-10	Population on 31-3-14	Remark
1	Nehru Zoological Park	Mouse Deer	2:5=7	More than 55	---
2	Pheasantry at CHAIL	Cheer Pheasant	17:12=29	29:28:17=74	
3	Padmaja Naidu Himalayan Zoological Park	Himalayan Salamander	6:6:1=13	6:7:16=29	
4	Pinjore Vulture Breeding Centre	Long billed vulture	62	107	
5	Pinjore Vulture Breeding Centre	Slender billed vulture	18	26	
6	Pinjore Vulture Breeding Centre	White backed vulture	137	163	
7	Manipur Zoological Park	Sangai	4:7=11	4:10:3= 17	
8	Padmaja Naidu Himalayan Zoological Park	Red Panda	9:3=12	8:5:4=17	
9	Sarahan Pheasantry	Western Tragopan	13:12=25	12:14:6=32	
10	Aizwal Zoo	Stump Tailed Macaque	7:9:18	10:9:4=23	
11	Biological Park, Itanagar	Hoolock Gibbon	10:7=17	10:7:1=18	One animal sent to other zoo
12	Sepahijhala Zoo	Pig Tailed Macaque	3:4:11=18	2:3:16=21	
13	Arignar Anna Zoo	Lion Tailed Macaque	9:8:3=20	8:8:7=23	
14	Sepahijhala Zoo	Phary's Leaf Monkey	5:7:2=14	5:7:5=17	
15	Padmaja Naidu Himalayan Zoological Park	Snow Leopard	5:5:1=11	5:4:5=14	
16	Sarahan Peasantry	Himalayan Monal	5:3=8	6:3=9	One birth
17	Nandankanan Zoological Park	Indian Pangolin	2:1:3=6	1:7=8	One birth

18	Assam State Zoo	Indian Rhino	3:2=5	3:3=6	
19	Biological Park, Itanagar	Hoolock Gibbon	10:7:0=17	10:6:2=18	One gibbon sent to other Zoo
20	Red jungle fowl	Morni pheasantry	295	397	

**Binturong and clouded leopard have been successfully bred but the advantage is lost due to high mortality rates

**Breeding of Asiatic lion has also been very good. As against 62 lions on 31-3-10, the Sakkarbaug Zoo now has more than 80 animals. This rise is accounted for new births only. .

*** Padmaja Naidu Himalayan Zoological Park, Darjeeling has tackled the problem very effectively by both in respect of Snow Leopard and Red panda .Recently the zoo got two wild snow leopards from Leh and Srinagar(Jammu and Kashmir). Due to effective upkeep and efficient health management 56 births have taken place.The Red Panda has not only been bred successfully but it has also been successfully released in the wild . Not only that the animals have settled in the wild and have started procreation

****The Indian pangolin breeding center at Nandankanan zoo is the best equipped, effectively managed and most intensively monitored conservation breeding center of the country.



Cheer pheasant breeding well

4) SUPPORT ACTIVITIES FOR THE CONSERVATION BREEDING PROGRAMME:

A) MARKING OF ANIMALS OF ENDANGERED SPECIES:

The authority has acquired Rings and transponders and the Readers for marking and identifies the animals forming part of Conservation Breeding Programme. More than 80% of the animals have already been marked. The matter is being pursued on a regular basis.

B) MAINTENANCE OF RECORDS:

ISIS has continued to assist zoos in maintenance the records pertaining to health care and breeding of endangered species. To upgrade the skills of Zoo Personnel in this regard Training Workshops " Sparks Software" were organized at Chennai, Guwahati in November 2010 and Chandigarh in January 2012.

C) MAINTENANCE OF STUD BOOKS:

Wildlife Institute of India, under a project sanctioned by the authority brought out National Stud-Books for 14 species A new project for maintaining Stud-Books 34 species (14 old and 20 new) at an estimated cost of Rs 52.67 lakhs was awarded to the Institute during the year 2011-12. National Stud books are being maintained under the project. Zoos are maintaining the stud-books for all the species for which the Conservation Breeding Programme is being supported by the authority.

A separate project for maintaining the stud-books for sloth bear, Himalayan black bear and Malayan Sun bear was awarded Wildlife- SOS during the year 2010-11.

5) RESEARCH SUPPORT FOR THE CONSERVATION BREEDING PROGRAMME:

Funding is being provided to LaCONES, Hyderabad under a project mode to carry out DNA studies on various species covered by CBPs:

- a) Two year project titled "Study on Red Panda" to Padmaja Naidu Himalayan Zoo, Darjeeling—Rs.5.13 lakhs
- b) Two year project on Red Panda nutrition to Padmaja Naidu Himalayan Zoological Park, Darjeeling—Rs.10.19 lakhs
- c) Two year project, "Studies on Biology and Breeding Behaviour of Captive Himalayan Pheasants", to Padmaja Naidu Himalayan Zoological Park, Darjeeling—Rs.9.43 lakhs

6) MONITORING AND FUTURE GUIDANCE FOR THE CONSERVATION BREEDING PROGRAMME:

The members of the Conservation Breeding Group moved from zoo to zoo and evaluated the execution of the CBP by the zoos, identified the bottlenecks if any and made very valid recommendations to redress the same. A résumé of these recommendations is provided here:

- (1) Mouse Deer Conservation Breeding Programme at Nehru Zoological Park, Hyderabad (1 March 2014)

The group recommended that (A) genetic Profiling of all the Mouse Deer at the breeding centre be done to screen the animals for genetic fitness and infectious diseases and (B) a core committee be constituted to work out the feasibility of releasing genetically and biologically



Mouse deer at Hyderabad Zoo

healthy animals into a suitable wildlife habitat. The committee should have sub-committees for (i) selection of the suitable site for release, (ii) studying the feasibility of release and (iii) designing the soft release centres. A detailed timetable for taking up various activities for successful release has also been suggested. The group has also suggested that efforts be made to introduce new blood in the animals at the breeding centres.

(2) Snow Leopard breeding centre, Darjeeling (6 June 2014)

The main recommendations made by the group were that (A) a 5 year project be prepared, (B) a detailed manual for conservation breeding of various species be prepared and (C) the Ministry of Environment and Forests, Government of India be requested to ensure that all rescued wild animals are sent to the coordinating zoos for purposes of genetic enrichment of captive bred animals.

(3) Rhino conservation breeding meeting, Guwahati (27 August 2014)

The main recommendations were that (A) a 5–10 year plan be prepared, (B) a biologist and a field assistant be engaged, (C) genetic profiling of all animals be carried out, (D) the studbook be updated, (E) enclosure enrichment be performed, (E) animals rescued from the wild be made available for the programme and (F) a coordination committee be instituted for the programme.

(4) Lion Tailed Macaque conservation breeding, Arignar Anna Zoological Park (8 August 2014)

The main recommendations were that (A) animals be transferred to participating zoos for greater heterozygosity, (B) more enclosures be constructed as needed, (C) enclosure and diet enrichment be carried out and (D) lone animals at other zoos that are fit for breeding be transferred to the coordinating zoo, i.e. Chennai.

(7) RESCUE CENTRES

The Central Zoo Authority continued to provide financial assistance for maintenance of the seven rescue centres that are housing Lions and Tigers rescued from circuses and the cost of feeding, upkeep and healthcare of these animals. Quite a few Lions and Tigers have died over the years due to ageing; yet the cost of running the rescue centres remains more or less the same. The primary reasons for this are that (a) certain minimum infrastructure has to be maintained at each centre irrespective of the number of animals maintained and (b) the price of meat is constantly rising.

Consequent to the decrease in the number of animals, a significant number feeding cells and kraals were lying vacant. The Central Zoo Authority directed the authorities of the concerned rescue centres/zoos to move the circus animals to a few identified blocks and to use the remaining blocks to house old and incapacitated animals housed in the zoo/rescued from the wild. The cost of feeding, upkeep and healthcare of these animals was to be borne by the zoo itself.

Accommodating rescued wild animals has assumed great significance in recent years. Every year more and more animals are being captured to redress man–animal conflicts. Accommodating these animals in the existing zoo facilities often leads to overcrowding and

compromising of the upkeep standards. The Central Zoo Authority has therefore decided that every zoo where adequate land is available should have a rescue centre as well as quarantine facilities. Provisions to this effect have been made in the master plans of zoos with adequate land. In this regard special mention can be made of Malsi Deer Park, Dehradun, Indira Gandhi Zoo, Vishakhapatnam, Pilikula Zoo, Mangalore and Bannerghatta Zoo, Bangalore. All the new zoos will also have such facilities. Provisions to this effect have been made in the layout plan of the proposed Satna Zoo. A new rescue centre is proposed to be constructed for housing rescued Panthers at Gorewada (Maharashtra). Two such centres were created in the state earlier.

(8) WELFARE OF THE ANIMALS HOUSED AT VARIOUS ZOOS

A) Meeting Behavioural Needs of Zoo Animals

The Central Zoo Authority has been very keen that the zoo animals are not subjected to any physical, behavioural and psychological stress. Taking advantage of the master planning process, sincere endeavours have been made to keep the carnivore housing facilities in separate units located far away from the ungulate, primate and bird enclosures. Prey-predator displays have been done away with. Proper screening of all animal enclosures is being provided to safeguard against animals in enclosures exciting predators in neighbouring enclosures.

Special campaigns are being organized to ensure behavioural enrichment in the animal enclosures to support species specific behaviour. A consultancy programme has been awarded to the Wildlife Institute of India, Dehradun to make specific recommendations in this regard. Efforts are on to phase out cramped enclosures if any and replace them by enclosures congenial to the physical health of the animals. To create greater sensitivity about this aspect of zoo management, a training workshop for zoo directors, "Different Aspects of Animal: Welfare in Zoos", was organized at National Institute of Animal Welfare, Ballabhgarh in July 2010.

Efforts are also on to provide animals feed that suits their natural instincts. To facilitate the process, zoos are carrying out projects for farming mice, insects, worms, etc. Good work has been done in this regard at Sri Chamarajendra Zoological Gardens, Mysore. A research project, "Developing a Protocol for Live Feed Management", has also been initiated.

Healthcare facilities have been regularly evaluated and constantly upgraded to make the zoo populations sustainable. A number of workshops have been conducted to upgrade the technical skills of zoo veterinarians. Funds have been provided to zoos for acquiring necessary equipment, including diagnostic facilities.

B) ZOO ELEPHANTS:

Zoos have been keeping elephants in their collections irrespective of



the fact whether they have adequate space for the purpose or not. As a consequence quite a few elephants were not only being kept in cramped enclosures but were also kept constantly chained. The animal welfare enthusiasts of the country were quite critical of this situation. The Chair Person of the authority had therefore directed that all elephants should be moved from the zoos to elephant camps in national parks and sanctuaries.

The State Governments and the zoo experts were not very comfortable with these orders because they felt that zoo elephants are quite popular amongst the zoo visitors and further because the zoos had better health care facilities. Giving due weightage to the views expressed by the State Governments and the zoo experts the authority constituted an appraisal committee on 18 May 2010 to examine the elephant housing facilities at all the zoos that are keen to keep the elephants in their animal collections and submit its views on the desirability of accepting their request or otherwise. The committee after inspecting all the 21 zoos, which were keen on keeping the elephants in their collection submitted its report, which was discussed at length by a separate sub-committee constituted for the purpose, under the chairmanship of Sri S.K. Patnaik. The committee held 2 meetings at Delhi in which members of the Central Zoo Authority, Animal Welfare Board of India, People for Ethical Treatment to Animals, People For Animals and other animal welfare enthusiasts also participated. The report of the Sub-Committee was accepted by the Central Zoo Authority. On the basis of the recommendations made by the sub-committee, the authority has granted permission to 15 zoos subject to the condition mentioned against the name of each zoo in the table given under-

Sl. No.	NAME OF ZOO	PRESENT NUMBER OF ELEPHANTS	MAXIMUM NUMBER OF ELEPHANTS	MINIMUM AREA OF ELEPHANT ENCLOSURE IN HECTARES
1	Arignar Anna Zoo, Chennai	4	5	25
2	Assam State Zoo, Guwahati	3	6	10
3	Bhagwan Birsa Zoo, Ranchi	3	5	10
4	Nandankanan Zoo, Bhubaneswar	7	7	8
5	Kamala Nehru Zoo, Indore	3	3	3
6	Bannerghatta Zoological Park	11	15	30
7	Sri Chamrajen Dra Zoo, Mysore	8	10	10
8	National Zoological Park, Delhi	2	2	2
9	Rajiv Gandhi Zoological Park	2	4	5
10	Tiruvanthapuram Zoo	2	1	One elephant is too old to be moved to some other zoo. Area to be increased to maximum possible extent

11	M.C.Zoological Park ,Chatbir	6	6	8
12	Nehru Zoological Park,Hyderabad	5	5	8
13	Kapilash Zoo,Dhenkenal,Orissa	3	5	10
14	Indira Gandhi Zoo,Vishakhapatnam	1	4	5
15	Venkateshwar Zoo Tirupati	4	4	10

*Alipore Zoo Calcutta will be allowed to increase the enclosure area to 2 hectares

*Alipore Zoo, Calcutta will be allowed to increase the enclosure area to 2 ha.

**Kamala Nehru Zoo, Ahmedabad will be allowed to retain its single Elephant provided the area of the enclosure is increased to 7 ha.

C) Ban on Dolphinariums & Oceanariums:

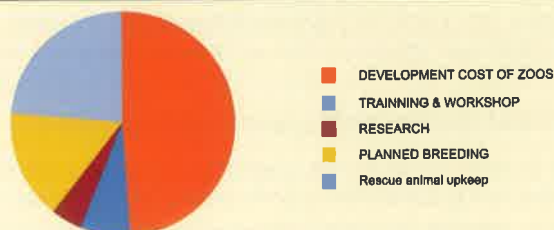
The Central Zoo Authority has also issued advisory that no Dolphinariums and or Oceanariums (including other marine animals) shall be established in the country in view of the fact that past endeavours in this regard have not been very encouraging.

9) DEVELOPMENT OF ZOOS:

A) FINANCIAL ASSISTANCE FOR DEVELOPMENT OF ZOOS

The development of zoos to enhance their role in conservation education and ex-situ conservation continued to be the core function of the Central Zoo Authority as will be evident from the break-up of the financial grants[Please indicate what the figures in the table indicate (such as lakhs of rupees).] given to zoos, a summary of which is given here:

Items	2010-11	2011-12	2012-13	2013-14	Total
Developmental cost of zoos	672.04	593.09	1049.61	891.55	3206.29
Training & workshop	160.74	96.70	124.54	96.70	478.68
Research	90.91	84.34	25.21	84.34	284.80
Planned breeding	131.66	439.13	250.10	216.95	1037.84
Rescue animal upkeep	489.52	392.46	335.69	315.69	1533.36
Total	1544.87	1605.72	1785.15	1605.23	6540.97



B) LIST OF ZOOS THAT ARE MAJOR BENEFICIARIES OF THE CENTRAL ZOO AUTHORITY'S FINANCIAL ASSISTANCE FOR DEVELOPMENT

Sl. No.	Name of the zoo	Remarks
1	Assam State Zoo, Guwahati	Construction of kitchen, improvement of enclosures, road and parking area
2	Biological Park, Itanagar	Improvement of animal enclosures, up-gradation of veterinary facilities
3	State Zoo Nagaland,	Construction of animal enclosures Rangapahar and other animal upkeep and health care facilities, creation of visitor and zoo education facilities
4	Malsi Zoo, Dehradun	Mini zoo developed in to full-fledged zoo and rescue center
5	Padmaja Hamalayan Zoo, Darjeeling	Construction & up-gradation of animal enclosures and zoo signage and visitors facilities
6	Aizwa I Zoo	Security wall and animal enclosures
7	National Zoological Park, Delhi	Animal enclosures and other facilities
8	Alipore Zoo ,Calcutta	Animal enclosures
9	Indira Gandhi Zoological Park, Vishakapatnam	Animal enclosures and other facilities
10	M.C. Zoological Park, Chhatbir (Punjab)	--do--
11	Arignar Anna Zoolo gical Park ,Chennai	Animal enclosures

C) IDENTIFYING RIGHT PRIORITIES

Over the years the number of zoos (large, medium and small) has increased along with the number of activities to be carried out by the zoos. The demand for funds from the Central Zoo Authority is always on the rise. For ensuring the release of funds to zoos in a transparent and rational manner, the Central Zoo Authority has issued detailed guidelines about the activities that are to be supported on a priority basis. The detail guidelines are reproduced in the following:

(i) Guidelines for Prioritizing Grant of Financial Assistance to Zoos

Considering the large number of zoos now operating in the country and the limited funds available with the Central Zoo Authority for supporting them, the technical committee decided to form a subcommittee to suggest modalities to prioritize zoos and activities that should be

supported by the Central Zoo Authority in order to bring in a quantum improvement in the general condition of important zoos, to facilitate conservation breeding and management of endangered species and to stimulate research and education.

Although the primary responsibility of the management of zoos is with state governments, municipal corporations, zoo owners and zoo operators, over a period, the Central Zoo Authority has been providing financial assistance to recognized zoos willing to be developed as modern zoos subject to the availability of funds and EFC approval.

Two broad categories of prioritization were identified for providing financial assistance to zoos.

- (A) Activity-wise prioritization
- (B) Institution-wise (zoo-wise) prioritization.

[A] ACTIVITY-WISE PRIORITIZATION

In 2007, before the commencement of the 11th 5-year plan, it was decided that 100% assistance would be provided for some activities (Category-A), and 50% assistance was envisaged for the activities mentioned under Category-B in the following.

Category-A (100% assistance)

Construction of new animal enclosures/modernization of existing animal enclosures for endangered species, creation/upgradation of veterinary facilities, conducting research activities (under Small Grant Fellowship Programme) and providing training of zoo personnel.

Category-B (50% assistance)

Development/improvement of infrastructure in zoos, such as footpaths, electricity network, water distribution network, drainage/sewage system, security fence/boundary wall and educational facilities

Category-C (proposed for consideration of 50% assistance)

Development of visitors' facilities (of non-commercial use), Construction of administrative buildings, residential quarters for staff, ticket counters and structures of commercial use will continue to be the sole responsibility of the zoo operators. No financial assistance will be provided for creation of new zoos. However, existing zoos which are being relocated to new sites shall be provided assistance on the pattern of existing zoos.

Various major activities identified are listed below in order of priority:

Activities

- A1. Enclosure/housing facilities for endangered species
- A2. Veterinary care
- A3. Preparation of master plan
- A4. Conservation breeding
- A5. Creation of rescue centres
- A6. Environment enrichment

- A7. Zoo research
- A8. Zoo education
- A9. Visitors' facilities (non-commercial)
- A10. Infrastructure (perimeter wall, sewers, drainage, pathways, etc.)
- A3. Preparation of master plan

Long term -master plans are essential for the planned development of any zoo. Hence all zoos preparing master plans should be assisted by the Central Zoo Authority up to the limit prescribed for each category. However, this quantum needs upward revision for obtaining the services of professionals in surveying, mapping, designing, etc. The present limits as fixed by the Central Zoo Authority are the following: large Zoos, Rs.4.00 lakhs; medium sized zoos, Rs.3.00 lakhs; small zoos, Rs.2.00 lakhs; and mini zoos, Rs.1.00 lakh.

A6. Environment enrichment

Most zoos in the country suffer from a lack of environment enrichment of enclosures. This causes monotony and psychological problems in zoo animals. Environment enrichment can be supported by the Central Zoo Authority up to the following limits if the concerned zoo provides a broad plan of action and cost.

Large enclosures (> 500 m2)	Max. Rs. 50,000.00
Medium sized enclosures (100-500 m2) __	Max. Rs. 20,000.00
-Small enclosures (<100 m2) _	Max. Rs. 10,000.00

However, The-maximum limits may be reviewed in specific cases on the basis of realistic enrichment plans.

A7. Zoo research

Funding for research shall be according to the pattern in column A 7 of the Table II.

A8. Zoo education

Expenditure for signage and interpretative material and for setting up interpretation centres is included in this item, and 50% of the cost shall be borne by the first four categories of zoos as indicated in the table..

A9. Visitors' facilities

Visitors' facilities, such as toilets, drinking water points, places for resting, shaded places/shelters, cloak rooms and transport for physically challenged persons shall be funded under this head subject to a maximum of 50% of the total cost. No construction for commercial activities shall be funded by the Central Zoo Authority. Besides, as it is mandatory to earmark 15% of the Central Plan funds for states of the North-east, at least the same percentage of Central Zoo Authority funding should go to those states.

[B] ZOO-WISE/INSTITUTION-WISE PRIORITIZATION

But considering the availability of funds with the Central Zoo Authority, if all the zoos are supported for all the activities mentioned, the essential activities [This sentence is incomplete. Please check.] in the major zoos of the country, which play or can play crucial role in conservation, research. Public awareness and education may not get the desired attention, and the funding will be spread too thin to make any tangible impact.

Hence it is absolutely essential to prioritize funding to selected zoos that can be improved to international standards and make positive contributions to achieve the stated objectives of the zoos. This is more important and urgent in view of the fact that India has been assigned the task of hosting the annual meeting of WAZA (World Association of Zoos and Aquariums) in 2014.

The Central Zoo Authority has also prepared 'Vision 2020' for ex-situ conservation and planning and improvement of zoos and has worked out the financial involvement involved in carrying out such works by 2020. This has also been taken into consideration in prioritizing funding support.

The prioritization of support shall be as follows.

B.I. Improvement of zoos

B.I. (a) Development of model zoos

The following zoos, in different regions of the country, should be given attention so that they are improved significantly and can support conservation breeding and zoo education and research.

Table I. Region-wise list of zoos to be developed as model zoos

S.No.	Northeast	East	North	West	South	Central	Islands
1	Assam Sate Zoo, Gauwahati (Assam)	Nandan-kanan Zoo, Bhubaneswar (Orissa)	M.C. Zoological Park, Chhatbir (Punjab)	Sakkarbaug Zoo, Janagadh (Gujarat)	Nehru Zoological Park, Hyderabad (Andhra Pradesh)	Van Vihar National Park Zoo, Bhopal (Madhya Pradesh)	Biological Park, Chidiyatapu (A&N Island)
2	Sepahijala Zoological Park, Sepahijala (Tripura)	Zoological Garden, Alipore, Kolkata (West Bengal)	National Zoological Park, New Delhi (Delhi)	Rajiv Gandhi Zoological Park & Wildlife Research Centre, Pune (Maharashtra)	Arignar Anna Zoological Park, Vandalur, Chennai (Tamil Nadu)	Kanan Pendari Zoo, Bilaspur (Chhattisgarh)	
3	Biological Park, Itanagar (Arunachal Pradesh)	Sanjay Gandhi Biological Park, Patna (Bihar)	Kanpur Zoological Park, Kanpur (Uttar Pradesh)	Bondla Zoo, Bondla (Goa)	Sri Chamarajendra Zoological Gardens, Mysore (Karnataka)		

4	Aizawl Zoo, Aizwl (Mizoram)	Padmaja Naidu Himalaya Zoological Park, Darjeeling (West Bengal)	Pt. Govind Ballabh Pant Zoo, Nainital (Uttarakh -and)	Jaipur Zoo, Jaipur (Rajasthan) Kerala)	Thiruvananth Apuram Zoo, Thiruvana-Thapuram		
5	Dimapur Zoo, Dimapur (Nagaland)	Bhagwan Birsa Biological Park, Ranchi (Jharkhand)					
6	Himalayan Zoological Park, Gangtok (Sikkim)						
Grand total: 26 zoos							

Each state is to identify one zoo as a model state zoo. Some of the other important zoos are:

1. Lion Safari, Vasona, Dadra & Nagar Haveli
2. Rohtak Zoo, Rohtak, Haryana
3. Himalayan Nature Park, Kufri, Himachal Pradesh
4. Jammu Zoo, Jammu, Jammu & Kashmir
5. Manipur Zoological Park, Imphal, Manipur
6. Lady Hydari Park Animal Land, Shillong, Meghalaya (new zoo site)
7. Lucknow Zoological Garden, Lucknow, Uttar Pradesh
8. Malsi Deer Park, Dehradun, Uttarakhand

Considering their importance, these zoos need to be developed as model zoos to bring them to international standards. Assistance is to be provided to them for all eligible activities for which they need assistance, depending on the availability of funds with the Central Zoo Authority.

B.1 (b) North-eastern zoos

All other zoos of the North-eastern states (other than those of Categories 1, 2 and 4 of Table II) should be supported for other proposed activities if they can be accommodated within the balance of 15% as allocated for North-eastern states or funds are remaining unutilized from the rest of the country.

B.1 (c) Small and medium sized zoos other than private zoos

These zoos shall be supported in the scale of zoos in category A, subject to the following maximum limits:

(i)	Large and medium sized zoos	-	Rs. 15.001 lakhs
(ii)	Smallzoos	-	Rs.10.00 lakhs
(iii)	Mini zoos	-	Rs 5.00 lakhs

B.I (d) Old zoos to be relocated

Some very old cramped zoos with old fashioned cage-type enclosures do not serve any conservation objective and send a very negative message to visitors. The Central Zoo Authority has recommended that they be upgraded to modern zoos at large, spacious sites. The zoo operators have accepted this and are developing the zoos in new, spacious sites. No funding shall be provided by the Central Zoo Authority for species other than those that are housed at the original location, subject to the condition that these zoos strictly adhere to plans/detailed designs approved by the Central Zoo Authority for all identified activities.

B.I (e) Mini zoos

Mini zoos shall not normally be supported, but in exceptional cases, subject to the availability of funds, the Technical Committee of the Central Zoo Authority may decide to provide support for selected works up to a maximum limit of around Rs.5.00 lakhs per annum.

B.I (f) Zoos and rescue centres run by private bodies/registered societies/trusts

Private zoos and zoos of corporate bodies other than public undertakings should ordinarily not be preferred. However, in special cases the Technical Committee may decide to provide support if this can contribute to conservation breeding or conservation education, research, etc.

B.II Rescue and rehabilitation

B.II (a) Rescue centres for circus animals

All such centres operated due to the Central Zoo Authority's initiatives shall continue to be fully supported as long as they continue to operate for the purpose of rescuing circus animals.

B.II (b) Rescue centres for wildlife (within existing zoos)

Rescue centres which are being operated within existing zoos shall be supported fully for items B1, B2, B5, B6 and B7 of Table II only.

B.II (c) New rescue centres outside existing zoos

No funding support shall be provided for such centres by the Central Zoo Authority.

B.III Conservation breeding centres

Many centres have been identified by the Central Zoo Authority for conservation breeding of endangered species as either coordinating or participating zoos. All funds required by such zoos for such purposes.

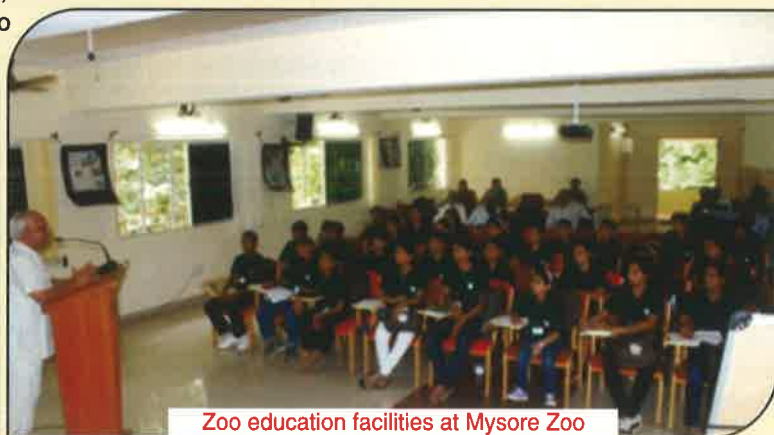
10) UPGRADING THE EVALUATION PROCESS

The basic objective of the development of zoos is to ensure that the animal housing, upkeep and health care facilities are in conformity with the Recognition of Zoo Rules and the civic amenities are up to the expectations of visitors. It has to also be ensured that zoos give the right conservation message in a loud and clear way and that zoos are operated in a manner that leaves minimum carbon footprints in and around the zoo area. To achieve these goals it is crucial that the zoos be evaluated in an objective manner so that the action points to be implemented are pinpointed and action for redressing the same can be taken up. Since each zoo is evaluated by a

separate set of evaluators, the evaluation reports invariably tend to vary in content and intent. To safeguard against these inadequacies, an objective type of format in question-answer form was developed by the Member Secretary and other members of the Central Zoo Authority. The Central Zoo Authority convened a 2 day workshop at Pune in February 2012 for getting the views of the zoo evaluators, zoo directors, scientists and other members of the Central Zoo Authority. The proposed format was discussed at length, and all the amendments were duly considered, and those found in the interest of the planned development of zoos were accepted. The workshop, after detailed deliberations, adopted the proposed format with appropriate amendments.

During the workshop, some members of the Expert Group of the Central Zoo Authority mooted the idea of adopting quantifiable parameters for effective evaluation on the lines suggested by the Toranga Zoo, Sydney a few years back at the meeting of the World Association of Zoos and Aquariums. A draft format was also placed before the participants for their consideration. The idea was widely acclaimed. However, some of the participants expressed doubts about the effectiveness of the proposed format in reliable evaluation of zoos. The workshop recommended that the idea of quantitative evaluation should be accepted. The format for quantitative evaluation should be further fine-tuned at the level of the Central Zoo Authority. The format was referred by the Central Zoo Authority to a sub-committee comprising of the Member Secretary, Central Zoo Authority, Shri S.K. Patnaik, Member, Central Zoo Authority, Dr. P.C. Tyagi, Faculty Member, Wildlife Institute of India, Dehradun, Shri S.C. Sharma, Member of the Expert Group on Zoo Designing and a representative of the Civil Construction Unit (CCU) of the Ministry of Environment & Forests (Shri C.S. Thakur). The sub-committee met on 14 March 2012 and fine-tuned the format for quantitative evaluation of zoos. Both the formats were finally approved by the Technical Committee of the Central Zoo Authority. The evaluators are now carrying out qualitative evaluation of zoos using the revised format. To test the efficacy of the format for quantitative evaluation of zoos, the Central Zoo Authority appointed a committee comprising Shri S.C. Sharma, Shri S.K. Patnaik, Shri B.C. Choudhury, Dr. Navin Kumar and Dr. Romel Mehta. The committee was requested to evaluate 11 large zoos of the country. The evaluation has been completed, and

the Central Zoo Authority has been appraised of the findings. The use of the quantitative parameters has yielded reliable data on the overall performance of zoos. The same method can be used for evaluation of other zoos also.



Zoo education facilities at Mysore Zoo

11) FINANCIAL SELF SUFFICIENCY AND SMOOTH FUND FLOW

The financial discipline of the state governments and the central government stipulates that an organization must spend every penny it has on the last day of March every year and then wait for a release of fresh grants to carry out any activity in the next financial year. This causes a lot of difficulty in the smooth functioning of zoos. Further, the absence of any linkage between the revenue earned by the zoo and the grants received by the zoo hardly provides employees any motivation for improving their performance and making the zoo visitor friendly. Against this background, the Central Zoo Authority has been persuading state governments to either establish state zoo authorities under the Societies Act to control, operate and develop all the zoos in the state or small trusts to operate and develop individual zoos. In either case, the entities created may be asked to primarily rely on the revenue earned to meet the operational costs of the zoo. For developmental costs, the authorities/committees could rely on grants received from the Central Zoo Authority and the state government. They should also have the freedom of tapping the support of the corporate sector/local zoo enthusiasts through innovative and socially responsible marketing. With a view to providing zoo directors an idea of the benefits of adopting such a strategy and the methodology to be adopted for effective marketing of zoos, the Central Zoo Authority organized a workshop, "Ex-Situ Conservation, Marketing, Fund Raising and Resource Management", at Kolkata in April 2010.



Zoo marketing workshop, Kolkata

The Director, Singapore Zoo and faculty members shared their experiences with the zoo directors on the subject. They appraised the members of the good work done by the Karnataka Zoo Authority in this regard. The Central Zoo Authority circulated a draft strategy for creating a state zoo authority/zoo trusts. Enthused and convinced about the merits of creating such a mechanism, the state governments of Tamil Nadu and West Bengal have established state zoo authorities. All the fund flows to zoos takes place through these authorities. Some other states are willing to follow suit. Several state governments have permitted zoos to use the revenue earned by them for operational costs. Several zoos have involved the private sector in a big way

in the upkeep of zoo animals. It is notable that the Karnataka/Tamil Nadu zoo authorities are financially self-sufficient and do not rely on grants for operation/development of the zoos under their administrative control.

12) MAKING ZOOS ENVIRONMENT FRIENDLY

The Central Zoo Authority has been impressing upon the zoos that they must convince visitors to shun wasteful utilization of electricity and water and to recycle waste products effectively. To achieve this goal, zoos will have to lead from the front and demonstrate in the field the use of the latest environment friendly technologies. It is heartening to note that several zoos of the country have taken appropriate measures for recycling of water and reducing the demand for electricity for day-to-day zoo operations. The Chamarajendra Zoological Garden, Mysore is harnessing water from Karanji Lake after purifying it by planting suitable species. Further, harvesting of rain water is being done in a very effective manner. It has been reported that the water consumption of the zoo in recent years has been reduced by 90% of the original consumption. Similarly, Arignar Anna Zoo, Vandalur is trying to meet the problem of a shortage of water in its wells by creating percolation tanks.



Karanji Lake, Mysore Zoo

Reducing the power requirement is another challenge. The Central Zoo Authority, on its part, is advocating zoos to adopt innovative designs for zoo facilities in such a manner that the demand of air-conditioners, water coolers and electric lighting is minimized. Most of the zoos have switched over to the use of LED lights, solar panels and timers/sensors that switch off the power when it is not required. Ahmedabad Zoo, in its reptile section, is using earthen tube heat exchangers to reduce the temperature and thereby avoid the use of air-conditioners/coolers.

Recycling of waste for useful purposes is being encouraged. Arignar Anna Zoo, Vandalur is recycling all the faecal matter from the animal enclosures as well as washing from the enclosures for providing organic manure to the fodder crops in their farm for enhancing productivity. Similar efforts are being made by Nandankanan Zoo also.

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13) RESEARCH AND EDUCATION

A) RESEARCH ACTIVITIES

1. The Central Zoo Authority awarded a 5 year research project, "Conservation of Endangered Species of Wild Animals Based on Genetic Polymorphism Studies and Assisted Reproduction" to LaCONES, Hyderabad at a projected cost of Rs.327 lakhs. Three instalments of Rs.65 lakhs each have already been released for the purpose.
2. The Central Zoo Authority is signing a memorandum of understanding with Smithsonian Research Institute (National Zoological Park, U.S.A.) on an exotic and wild animal veterinary research project.
3. A tripartite agreement for research on contraception and population control measures for the Rhesus Macaque has been signed with the Wildlife Institute of India and University of California, Davis.
4. C.C.U. of the Ministry of Environment & Forests has been given a small grant fellowship for preparing a manual, "Standard Designs of Zoo Enclosures", at a cost of Rs.6.75 lakhs.
5. A project for identification, sexing and marking turtles, tortoises and terrapins submitted by the Madras Crocodile Bank and Turtle Survival Alliance has been approved.

B) EDUCATION

1. The Vulture Conservation and Breeding Center has published a Manual on Conservation Breeding of Vultures. The same has been circulated to all zoos.
2. Guidelines on "Utilization of Volunteers in Zoo Management in India" and "Guidelines for Housing and Management of Exotic Animals in India" have been published and circulated to Zoos.
3. Guidelines for housing Hippos, Elephants and exotic bird finalized and are being enforced.
4. Guidelines for "Developing a Framework Mechanism for Mobilizing Corporate Financial Support for Supplementing the Management of Zoos finalized.



14) PUBLICATIONS

1. With a view to ensuring better communication and coordination between zoos and dissemination of knowledge and experience between zoos, the Central Zoo Authority is bringing out a quarterly news letter, "Ex-Situ Updates", which highlights major happenings and development activities in zoos of the country and abroad. Rules and guidelines issued by the Central Zoo Authority from time to time are also highlighted in the newsletter.
2. On the basis of research work carried out under projects awarded by the Central Zoo Authority, the Indian Veterinary Research Institute, Bareilly has published manuals titled "Prevention, Diagnosis & Treatment of Diseases in Zoo Animals" and "Standardization of Diet for Animals in Indian Zoos".
3. Guidelines on the upkeep of reptiles in Indian zoos have been developed by Pune Zoo.
4. The Central Zoo Authority has published a booklet titled "Zoos of India" containing legislation, policies, guidelines and strategies related to zoo development. The booklet was released by the Hon'ble Minister of Environment and Forests at a meeting of the Central Zoo Authority held on 12 September 2014.

Besides this, several small publications giving details of research findings from projects awarded to zoos by the Central Zoo Authority have also been published.

15) HUMAN RESOURCE DEVELOPMENT

Training programmes and workshops for upgrading the technical skills of zoo personnel continue to be a high priority activity from 2010–2011 to date. The programmes were made more focused and target oriented. Details of workshops organized for zoo directors have already been given in the relevant foregoing sections, except the workshop organized at Chamarajendra Zoo, Mysore in December 2013, "Zoos: A Window to Biodiversity". The workshop was quite useful in sensitizing zoo directors to making the zoo environment nature immersing.

a) TRAINING WORKSHOPS FOR DIRECTORS, VETS AND SUPERVISORS

Sl.No.	Year	Venue	Course Organizer	Target Group	Course Focus
1	2010-11	Patna	Sanjay Gandhi Biological Park	Zoo Educators	Conservation Education and Zoos
2	2010-11	Bhubaneswar	Nandankanan Zoo	Zoo Biologists	Endangered Species Management
3	2011-12	Chennai	Madras Veterinary College and Arignar Anna Zoo	Zoo Vets	Protocol for safety & veterinary Care during transport of zoo animals with special reference to deer species
4	2012-13	Bhopal	Van Vihar Zoo, Bhopal	Zoo Educators	Conservation & Zoo Education
5	2013-14	Jaipur	Nahargarh Biological Park	Zoo Biologists	Zoo as tool for Scientific Management of Animals with special focus on research.
6	2013-14	Mysore	Sri Chamarajendra Zoo, Mysore	Zoo Directors	Zoos Window to Biodiversity



b) ZOO KEEPERS TRAINING

Two week training programmes were organized for zoo keepers as per the details given here:

Sl.No.	Year	Venue	Focus of the Course	Remark
1	2010-11	Sarhan Pheasantry (H.P) Sri ChamrajenDr.a Zoo Mysore, Kamla Nehru Zoological Park, Ahmedabad Assam State Zoo, Guwahati	Management of Birds in Captivity,	Total 100 Zoo Keepers were trained
2.	2011-12	SriVenkateshwar Zoo, Tirupati Sakkarbaug Zoo, Junagarh Sepahijhala Zoo, Agartala Nandankanan Biological Park, Bhubaneswar	Management of Carnivores in Captivity	Total 100 Zoo Keepers were trained
3	2012-13	Assam State Zoo Guwahati	Restraint of Zoo Animals and their transport	More than 20 keepers trained
4	2013-14	Assam State Zoo, Guwahati Kamala Nehru Zoo, Ahmedabad Sri Chamrajenra Zoo, Mysore M.C.Zoological Park, Chhatbir G.B. Pant Zoo, Nainital, Nandankanan Zoo, Bhubaneswar	Management of Wild Animals trained in Captivity	More than 100 Zoo Keepers were

c) WORKSHOPS OF A SPECIALIZED NATURE

Sl. No.	Dates of workshop	Organizers' of the workshop	Focus of the workshop	Stake-Holders/ Participants
1	30-01-2012	Indian Veterinary Research Institute, Bareilly	Standardization of animal diet in Indian Zoo	Zoos Zoo Directors, Vets and Members of Expert Group of C.Z.A
3	3rd to 5th May 2012	Vulture Breeding Center, Pinjore	Vulture Conservation in Asia	Representatives of various Countries and C.Z.A experts
4	26th to 30th November 2012	M.O.E.F, C.Z.A, W.I.I and Wildlife Trust of India	International Conference on Research and Management of Bears	In-situ managers and zoo managers
5	8th to 12th July 2013	C.Z.A, LaCONES Hyderabad and Nandankanan Zoo	Conservation Breed- ing and Species Recovery Planning	Zoo Directors and the Expert Group of C.Z.A

6	16th to 19th Septembers, 2013	C.Z.A, LaCONES and Nehru Zoo Hyderabad	--do---	---do---
7	10th to 13th December	Durrell Wildlife Conservation Trust, U.K and C.Z.A	Building up of National Capacity for Conservations and Ex-Situ Management of Amphibians	Zoo Personnel and Zoo Directors
8	28th Jan, 2014	C.Z.A and Vulture Breeding Center	Conservation Breeding Programme for India	Zoo Directors and Breeding Expert
9.	17th to 21st November, 2012	CZA, Durrell Conservation Academy, Jersey and Padmaja Naidu Himalayan Zoological Park Darjeeling	training programme on "Endangered Species Recovery	

d) INTERNATIONAL EXPOSURE AND TRAINING

To provide zoo Directors and zoo veterinarians with international exposure, the practice of deputing one zoo director and one zoo veterinarian to the 3 week training programme on conservation at Jersey Wildlife Preservation Trust, U.K. continued, and the following officers were trained there:

S N	Year	Name	Position
1	2010-11	Dr. Sudarshan Panda Sri B.K.Gogoi	Director, Nandankanan, Zoo Pathologist, Assam State Zoo, Guwahati
2	2011-12	Dr. V.K.Srinivas	Veterinary Officer, Indira Gandhi Zoo Vishakhapatnam
3	2012-13	Dr. Arvind Kumar	Veterinary Officer, Jaipur Zoo
4	2013-14	Sri Chandan Bora Dr. Ajay Kumar	Director, Assam State Zoo, Guwahati Veterinary Officer, Bhagwan Birsa Biological Park, Ranchi, Jharkhand

16) INTERNATIONAL COOPERATION

- 1) The Central Zoo Authority has been sending one zoo director and one zoo veterinarian to the 3 week course at Durrell's Academy, U.K. However it was felt that the number of persons so trained was inadequate to meet the requirement of scientific management of all the zoos in the country. Therefore the Central Zoo Authority signed a memorandum of understanding with the academy to conduct training programmes in India. The course contents are decided giving due regard to the technical needs of Indian zoos. The academy organized the first training programme, "Endangered Species Recovery", from 17 to 19 November 2011 at Darjeeling. Twenty-six zoo directors and veterinarians

participated. With the collaboration of the SARC Secretariat, zoo personnel from Sri Lanka and Nepal also participated in the programme. The academy organized the second training programme, "Ex-Situ Conservation and Management of Amphibians", between 10 and 13 December 2012 at Guwahati. Sri Lanka and Nepal also participated in the programme. The Academy organized the second training programme in 10-13 December 2012 at Guwahati on "Ex-situ Conservation and Management of Amphibians".



- 2) The Central Zoo Authority has entered a memorandum of understanding with the Singapore Government. The Central Zoo Authority and the Wildlife Reserve, Singapore will cooperate with each other in human resource development, capacity building and animal exchange. Shri K.S.V.P. Reddy, Director, Arignar Anna Zoo and Shri A.K. Bhowmik, Director, Sepahijala Zoo attended a training programme on animal enrichment at the Singapore Wildlife Reserve under this programme. Dr. Abraham Mathews, of Singapore Wildlife Reserve, also attended the training programme for zoo biologists at Bhubaneswar.



Signing of MoU between the Central Zoo Authority & Wildlife Reserve Singapore

- 3) The Central Zoo Authority signed a memorandum of understanding with the National Trust for Nature Conservation, Nepal for cooperation with all countries of the region on issues related to human resource development and research issues. Under this agreement, zoos of all SARC countries will work hand in hand to improve the zoos of the region.
- 4) The Member Secretary continued to be in touch with the authorities of the World Association of Zoos and Aquariums to give final touches to the programme for the ensuing annual conference at Delhi.
- 5) India signed a memorandum of understanding with Leipzig Zoo, Germany for exchanges of technical expertise and animals of identified species in the best interest of their conservation



Member Secretary CZA with Executive Director WAZA, Dr. Jerald Dick & Future Organizers of WAZA (Czech Republic, Disney World US, India & Australia) annual meeting

17) FUTURE VISION

In a country like India, the justification of zoos will always lie on their success in mustering people's support for national conservation efforts by creating amongst them empathy for nature and appraising them about the intricate linkages between the existence of wilderness areas the life support system of the planet. This will involve making visits to zoos rewarding and educative for all sections of society. Displaying healthy animals in nature immersing enclosures will play a crucial role in this regard. The zoo personnel will have to perfect the science of developing self sustaining populations of genetically, behaviourally and physically healthy animals and designing nature immersing exhibits. They will also have to upgrade their communication skills to such an extent that the conservation message to the visitors is loud and clear.



Meeting of Central Zoo Authority on 12-09-2014

The Central Zoo Authority has made significant efforts in this direction by dint of sincere efforts of the members of the authority and the support of the Government of India. Yet we still have to go a long way. However, the success of this journey will depend on the state governments, who are the main operators of the zoos in the country, They have to be sensitive to the needs of the zoos for finances, and the continued availability of technically qualified, committed zoo personnel. Research Institutes have to come forward to augment the technical knowhow available with the zoos. The corporate sector can also play a crucial role in the plan development of zoos. All the stakeholders must work in tandem to develop zoos into centres of excellence in both conservation education and conservation breeding. The World Association of Zoos and Aquariums (WAZA) and other international organizations working in ex-situ conservation should also facilitate the process of planned development of zoos.



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Zoos must keep on developing...