

Welfare Assessment of Wildlife Animals and Birds in Central Zoo of Kathmandu, Nepal



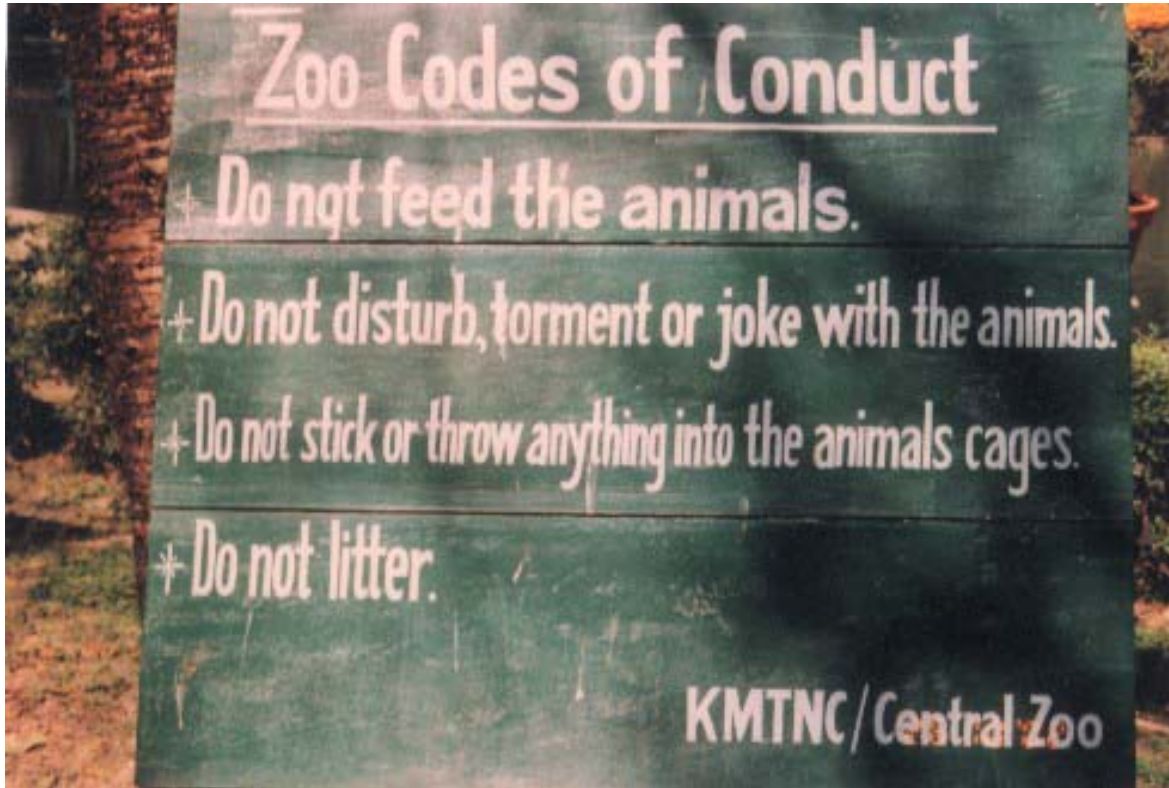
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**National Zoonoses and Food Hygiene Research Centre
Kathmandu, Nepal**

World Society for Protection of Animals (WSPA), UK

2007

Welfare Assessment of Wildlife Animals and Birds in Central Zoo of Kathmandu, Nepal



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**Conversion Table from Nepali Calendar Year to Gregorian Calendar year.
B.S to A.D**

Nepali Month Conversion Table	
Nepali Calendar Month	Gregorian Calendar Equivalent
Baishak	Middle of April to middle of June
Jestha	Middle of May to middle of July
Asadh	Middle of June to middle of July
Srawan	Middle of July to middle of August
Bhadra	Middle of August to middle of September
Aswin	Middle of September to middle of October
Kartik	Middle of October to middle of November
Mangsir	Middle of November to middle of December
Poush	Middle December of to middle of January
Magh	Middle of January to middle of February
Falgun	Middle of February to middle of March
Chaitra	Middle of March to middle of April

Nepali Year Conversion Table	
Nepali Calendar Year (Begins in Mid April)	Gregorian Calendar Year
B.S. (Bikram Samvat)	A.D.
2048	1991/92
2049	1992/93
2050	1993/94
2051	1994/95
2052	1995/96
2053	1996/97
2054	1997/98
2055	1998/99
2056	1999/2000
2057	2000/2001
2058	2001/2002
2059	2002/2003
2060	2003/2004
2061	2004/2005
2062	2005/2006
2063	2006/2007

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PREFACE & ACKNOWLEDGEMENT

The Central Zoo was established about seventy years back, it was in the outskirts of the city with clean non-polluted environment. Today's central zoo sits 'land locked' right in the center of busy, polluted Jawalakhel area unable to develop further due to lack of space. While the central zoo serves the needs of the people for recreation and education and even to greater extent conservation through various programmes it is not and will not be able to convert to the modern concepts of safaris and large exhibits. In recent years Kathmandu has developed and grown tremendously and in the process of growing, many require another big branch of central zoo some distance away, preferably within Kathmandu valley or very close to valley, where natural habitats for animal could be created with conservation education, wildlife research and entertainment including night safaris - a demand of present tourist industry.

"Animal welfare is the physical and psychological state of an animal as it regards its attempt to cope with its environment" has been defined by Professor Donald Broom, Chair of Animal Welfare, Department of Clinical Veterinary Medicine, University of Cambridge, UK (WSPA, UK, 2001). To understand the basic needs of wildlife in captivity is the first step in conducting an assessment. These needs are explained by Dr. Rob Laidlaw in his paper presented in WSPA meeting April 2-6, 2001. On the basis of this NZFHRC developed a project proposal to study the welfare assessment of wildlife animals and birds in the Central Zoo of Kathmandu, Nepal. This project was then approved and supported by WSPA, UK.

The Objectives of the project were as follows:

- 1) To assess the basic needs of zoo animals and birds in Kathmandu Zoo. These basic needs are as follows:
 - Freedom from hunger and thirst by ready access to fresh water and diet to maintain full health and vigour.
 - Freedom from thermal and physical discomfort by providing an appropriate environment including shelter and a comfortable resting area.
 - Freedom from injury and disease and pain by prevention or rapid diagnosis and treatment.
 - Freedom to express most normal patterns of behaviour by providing sufficient space, proper facilities and company of the animal's own kind.

- Freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering
- 2) To get the evidence of bad treatment and cruelty towards animals and birds in Kathmandu Zoo.
 - 3) To develop and recommend animal welfare plan for zoo of Kathmandu.

The study was completed in six months of time from June to November 2002. An attempt has been made in this study to document the conditions of the captive animals housed in the Jawalakhel Zoo through an assessment of Five freedoms.

Being the first study on captive animals at the central zoo, it gives an insight into the conditions of animals housed in the zoo that has the best resources and draws out a frank appraisal of animal welfare at the zoo. Furthermore this will help the upcoming private zoos in Dhankuta and Hetauda or other places of Nepal.

I am most grateful to WSPA particularly Ms Pei-feng Su, Manager of Member Societies, Asia, Dr. Victor Watkins, Liberty Director, Mr. Robert Laidlaw, Projects Manager, Ms Dawn Peacock, Programme Coordinator for their kind technical and financial support. I must thank Dr. Bhola Mehar Shrestha, Consultant, Dr. Bimal Chhetri, Veterinary Surgeon, Ms. Minu Sharma, Programme Officer and Ms. Meena Dahal, Computer Analyst and Mr. Mahendra Maharjan, Research Officer of NZFHRC for their hard work done in completion of this research study.

I am most obliged to all the staff of the Jawalakhel Central Zoo who have supported our field survey inside the Zoo.

Dr. Durga Datt Joshi
Principal Investigator

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ACRONYMS

AZA	American Zoo and Aquarium Association
CBSG	Conservation Breeding Specialist Groups
CVH	Central Veterinary Hospital
DLS	Department of livestock services
GO	Government Organisation
HMG	His Majesty's Government
I.U.	International Unit
IUCN	International Union for Conservation of Nature
JT	Junior Technician
JTA	Junior Technical Assistant
KMTNC	King Mahendra Trust for Nature Conservation
KTM	Kathmandu
NGO	Non Governmental organisation
NZFHRC	National Zoonoses and Food Hygiene Research Centre
SAZARC	South Asian Zoos Association for Regional Cooperation
SSC	Special Survival Committee
WSPA	World Society for Protection of Animals

Welfare Assessment of Wildlife Animals and Birds in Central Zoo of Kathmandu, Nepal

1. Background information

1.1 The Country

Nepal is a land-locked country bordered by China to the north and India to the west, south and east. Its dimensions are roughly 885 km (east to west) by 193 km (mean width) with a total land area of 147,181 km². Politically, Nepal is divided into 5 developmental regions, 14 zones, and a total of 75 districts. The population was 18,491,097 in 1991 and is growing at a rate of 2% a year. For such a small country, Nepal is a land of extremes, and can be divided into 4 main geographic regions. The Himalayan Mountain region in the north contains the world's tallest peak, Sagarmatha (Mt. Everest) at 8,848 meters, and 8 of the world's 14 highest peaks. In sharp contrast is the lowland Terai region to the south, which ranges in altitude from only 100 to 300 meters above sea level. The other 2 geographic regions are the hill region, which includes the Siwalik and Mahabharat ranges, and Valley region, which includes the Kathmandu and Pokhara Valleys. The Terai region is the primary agricultural region of the country and has a hot tropical climate with high seasonal rainfall and lush natural vegetation. Poor internal transportation, communication and extremely rugged topography are major physical constraints to the development. These are further aggravated by socio-economic constraints. 42% of the population lives below the poverty line. Recent data published by CBS indicate that about 61% of the country's population are illiterate. Despite efforts to diversify its direction of trade, Nepal handicapped by a geographically unrestricted border with India, which precludes independent economic management.

1.2 Historical review of the Jawalakhel Zoo

The history of the zoos goes back to very ancient times in China and in the Middle East. The King Emperor and Royalties attached with places initiated the collection of animals and birds for a variety of reasons: for intellectual Curiosity, for demonstrating power and prestige, hunting, for private, public spectacle or entertainment etc. Other individuals or institutions that could afford to do so also kept collection of animals and birds for nearly the same reason over the centuries.

The first modern Zoo was established in Vienna (Austria) in the year 1752 followed by Paris (France) in 1793, London Zoo (England) in 1826,

Philadelphia Zoo (U.S.A.) in 1874 and Hamburg Zoo (Germany) in 1907. In Nepal, the then Prime Minister Juddha Shumsher Jung Bahadur Rana established Zoo in 1932 as a private collection of animals and birds. The Zoo was started with basic infrastructure such as premises holding cages, pond, water supply and sanitation, which formed a launching pad for a full-fledged Zoo in the same compound. It spreads over an area of approximately 6.5 Hectares. Out of this over 1/5 of its area is occupied by historic pond constructed in 16th century during Malla King Period. Religious valued (2) temples are present within the zoo compound. Since then the zoo has undergone many additions and modifications.

After the end of Rana Regime in 1951 A. D., the facility was takeover by His Majesty 's Government of Nepal and opened to the public in 1956 after converting it to today's central zoo (Sadar Chidiyakhana in Nepali). Over the years management of zoo was under various departments of Ministry of Agriculture and Ministry of Forestry of many years due to uncoordinated approach, lack of proper planning, inadequate finance, the growth of zoo was stagnant. Each year condition of the zoo was deteriorating. Though primary aim of the zoo was to display the captive animals and birds of different species, it also served as a significant social and cultural center - a place for large cultural, social and religious gatherings at different times of the year. The central zoo has approximately one million visitors per year and in festivals like Bhote Jatra about 34000 people visit the central zoo in a single day.

On December 29, 1995, His Majesty's Government of Nepal handed over the management of the central zoo to King Mahendra Trust for Nature Conservation (KMTNC), on the occasion of Golden jubilee celebrations of His Majesty the late king Birendra Bir Bikram Shah Dev's auspicious birthday for a period of 30 years with the first five years of financed support. Now from July 16, 2001 A.D. central zoo is more or less self sustained under KMTNC management.

After the takeover of the central zoo by KMTNC, efforts have been underway for its improvement. Within a short period of time the central zoo management has improved the old structure, beautified the area, placed new tools for entertainment, added few new species of animals and birds notably Siamong, Ostrich, Hippopotamus, Parrots, Cockatoo and has designed a long term plan for the future growth and development of the central zoo (Joshi, 2001).



Photograph 1. Two Male Black bucks basking in the sun



**Photograph 2. Display board for visitors with information on the exhibits
(Here: Black buck)**

The zoos in the developing nations have been subject to criticism for pathetic conditions of animal welfare (Nurshahid et al, 2002). When the central zoo was established about 70 years back, it was in the outskirts of the city with clean non polluted environment. Today's central zoo sits ' land locked ' right in the center of busy, polluted Jawalakhel area unable to develop further due to lack of space. While the central zoo serves the needs of the people for recreation and education and even to a grater extent conservation through various programmes it is not and will not be able to convert to the modern concepts of safaris and large exhibits. In recent years Kathmandu has developed and grown tremendously and in the process of growing, many require another big branch of central zoo some distance away, preferably within Kathmandu valley or very close to valley, where natural habitats for animal could be created with conservation education, wildlife research and entertainment including night safaris - a demand of present tourist industry.

1.3 Animal welfare

"Animal welfare is the physical and psychological state of an animal as it regards its attempt to cope with its environment" has been defined by Professor Donald Broom, Chair of Animal Welfare, Department of Clinical Veterinary Medicine, University of Cambridge, UK (WSPA, UK, 2001).

General guidelines for keeping the animals in such a way that welfare can be measured are contained in the five freedoms. These freedoms are ideal states rather than an attempt to define standards for acceptable welfare.

Five freedoms simply put mean that animal enjoys;

- Freedom from hunger and thirst by ready access to fresh water and a diet to maintain full health and vigor.

This is regarded as the basic need-the method of food presentation, the frequency of feeds and the nutritional balance must be taken into account. Food should be presented in a manner and frequency to commensurate with the natural behavior of the species as well as taking nutritional requirements into account.

- Freedom from thermal and physical discomfort by providing an appropriate environment including shelter and a comfortable resting area.

Areas of importance are shelters from rain, heated enclosures consistent with species' requirements, cool and shaded areas for species such as penguins. The nature of the physical environment should be taken into account. Animals that dig and root must be provided with suitable substrates,

climbers must be provided with three-dimensional environments. A balance must be struck between hygiene and the species' biological requirements.

- Freedom from injury and disease and pain by prevention or rapid diagnosis and treatment. The enclosure design should minimize the risk of injury as should group composition. The design should ensure that animals could get away from each other. In mixed species' exhibits care should be taken that one species cannot injure another. Enclosures should be designed to minimize the risk of predators entering the exhibits. Proper arrangements for curative and preventive veterinary medicine must be in place and operational. Every effort must be made to provide a correct diet and to provide a suitably hygienic environment from which pathogens are excluded or controlled.
- Freedom to express most normal patterns of behavior by providing sufficient space, proper facilities and company of the animals own kind.
- Freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering.

There is an overlap with other four freedoms. Particular areas to look at are: group composition, sex ratio and numbers of animals in the enclosure. Space and furniture in both indoor and outdoor areas, zoo animal are often confined for long periods in indoor area and the group composition should reflect this. Enclosure design should be such that it allows normal behavior and areas to escape from other animals. Animals often benefit from mixed species exhibits however interspecies conflict can cause stress & this needs to be monitored & recorded.

The five freedoms form a logical and comprehensive framework for the analysis of welfare, together with the steps and compromises necessary to safeguard and improve welfare. The five freedoms are a useful tools for assessing wildlife in captivity situations, but they do not address many of the moral concerns surrounding the keeping of wildlife in captivity such as whether or not it is ethical to keep animals in captivity at all.

2. Objectives

1. To assess the basic needs of zoo animals and birds in Kathmandu Zoo.

These basic needs are as follows:

- Freedom from hunger and thirst by ready access to fresh water and diet to maintain full health and vigour.
 - Freedom from thermal and physical discomfort by providing an appropriate environment including shelter and a comfortable resting area.
 - Freedom from injury and disease and pain by prevention or rapid diagnosis and treatment.
 - Freedom to express most normal patterns of behaviour by providing sufficient space, proper facilities and company of the animal's own kind
 - Freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering
2. To get the evidence of bad treatment and cruelty towards animals and birds in Kathmandu Zoo.
 3. To develop and recommend animal welfare plan for zoo of Kathmandu.

❖ Objectives Rationale:

To understand the basic needs of wildlife in captivity is the first step in conducting an assessment. These needs are explained by Dr. Rob Laidlaw in his paper presented in WSPA meeting April 2-6, 2001 which are as follows:

- The need to lead natural lives through the development and use of their natural adaptations and capabilities.
- The need to feel well by being free from intense fear and other negative states, & by experiencing normal pleasures.
- The need to function well, in the sense of satisfactory health, growth and normal functioning of psychological and behavioural systems.

So far nobody has made any assessment in animal welfare in Kathmandu Zoo. This study was the first attempt to assess the physical conditions of the zoo and welfare of Zoo animals.

3. Methodology:

The entire process of assessment was done by the following methods.

1. Secondary information was collected from documents from Zoo or other offices.
2. Primary survey study was carried out with the help of checklist, observations, photography and interviewing with zoo authority and staff.
3. Enrichment items for different kinds of animals and bird species were used during study period to assess behavioural modifications.
4. Analysis of present standards for the accommodation and care of animals in Kathmandu Zoo was done taking into account:-
 - Structures –
 - shade and shelter
 - environmental conditions
 - cleanliness
 - Stimulation
 - food and water
 - furnishings - fixed and non-fixed
 - environmental enrichment
 - Safety and security
 - Accommodation and care of animals
 - Animal health and care
 - Prevention of stress or harm to animals
 - Access for the public
 - Emergency first - aid
 - Insurance against liability for damage or injury caused by animals.
 - Transportation and movement of live animals within and outside Zoo.
 - List of animals with their scientific name and common name with numbers.
5. Assessment of the physical and psychological well being of Zoo animals.
 - Behaviour

- aggression
 - fear and anxiety
 - stereotypes and other disturbed behaviour
 - Physical condition
6. A detailed checklist was prepared for the assessment.

4. Results and Discussions

4.1. Jawalakhel Zoo under KMTNC

KMTNC is committed to develop central zoo as center of excellence for ' conservation education and wild life research' under principles of modern zoo philosophy.

- To improve animal health and care and welfare by creating natural habitat and providing food according to their dietary requirements.
- To encourage research and provide conservation education through first hand experience of wild animals
- To raise public awareness about the importance of nature conservation.



Photograph 3. A display board on spotted deer

4.1.1 Present programmes and exhibits

To fulfill the above objective the central zoo has presently initiated following programmes

- i. Conservation education programme
 - a) Based on school request and,
 - b) Based on membership (Friends of the zoo)
- ii. Animal collection and management through exchange of surplus animals and birds and through purchase.
- iii. Animal sponsorship programme. The sponsorship cost varies from 170 US\$ to 3340 US\$, mainly to support feeding.

Presently the central zoo houses about 792 animals of 125 species. Among these are 32 mammals, 9 reptiles, 21 species of fish and 63 bird species.

Mammals

i. Native - 27 species	32 species		234 Nos.
ii. Exotic - 5 species			

Reptiles

i. Native - 7 species	9 species		19 Nos.
ii. Exotic - 2 species			

Fishes

i. Exotic - 21 species	21 species	246 Nos.
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Birds

i. Native - 45 species	63 species		293 Nos.
ii. Exotic - 18 species			

Total **125 species 792 Nos.**

➤ **List of animal and bird species housed in the central zoo**

A. Mammals

i. Native mammals

S.N.	Nepali Name	Common Name	Scientific Name
1.	Chittal	Spotted Deer	<i>Axis axis</i>
2.	Barasingha	Swamp Deer	<i>Cervus duvaucelli</i>
3.	Krishnasar	Black Buck	<i>Antelope cervicapra</i>
4.	Dhwanse Chituwa	Clouded Leopard	<i>Neofelis nebulosa</i>
5.	Kalo Nir Biralo	Large Indian Civet	<i>Viverra zibetha</i>
6.	Kasturi Biralo	Himalayan Palm Civet	<i>Pagumma larvatta</i>
7.	Nir Biralo	Common Palm Civet	<i>Paradoxurus hermaphroditus</i>
8.	Koiralo	Flying Squirrel	<i>Petaurista petaurista</i>
9.	Lokharke	Common Squirrel	<i>Funnambulus palmarum</i>
10.	Thulo Lokharke	Indian Giant Squirrel	<i>Ratufa indica</i>
11.	Laguna	Hog Deer	<i>Axis porcinus</i>
12.	Ratuwa Mirga	Barking Deer	<i>Muntiacus muntjak</i>
13.	Langure Bandar	Common Langur	<i>Presbitis entellus</i>
14.	Angora Kharayo	Angora Rabbit	<i>Oryctolagus cuniculus</i>
15.	Kharayo	Native Rabbit	<i>Oryctolagus cuniculus</i>
16.	Bagha	Royal Bengal Tiger	<i>Panthera tigris</i>
17.	Gaında	One Horned Rhinoceros	<i>Rhinoceros unicornis</i>
18.	Nyauri Musa	Mongoose	<i>Herpestes nepalensis</i>
19.	Kalo Bhalu	Himalayan Black Bear	<i>Selenarctus thibetanus</i>
20.	Kathe Bhalu	Sloth Bear	<i>Melurus ursinus</i>
21.	Hundar	Striped Hyena	<i>Hyaena hyaena</i>
22.	Chituwa	Common Leopard	<i>Panthera pardus</i>
23.	Hatti	Asian Elephant	<i>Elephas maximus</i>
24.	Arna	Wild Buffalo	<i>Bubalus bubalis</i>
25.	Asami Rato Badar	Assamese Monkey	<i>Macaca assamensis</i>
26.	Ghod Gadha (Nilgai)	Blue Bull	<i>Boselaphus tragacamelus</i>
27.	Ban Biralo	Jungle Cat	<i>Felis chaus</i>

ii. Exotic mammals

S.N.	Nepali Name	Common Name	Scientific Name
1.	Gini Pig	Guinea Pig	<i>Cavia aparea</i>
2.	Shinha Puchchhar Ban	Lion Tailed Macaque	<i>Macaca silenus</i>
3.	Kalo Bandar	Francios Langur	<i>Trachypithecus franciosi</i>
4.	Ban Manchhe (Simang)	Siamang	<i>Hylobates syndactylus</i>
5.	Jal Gaında	Hippopotamus	<i>Hippopotamus amphibious</i>

B. Reptiles

i. Native Reptiles

S.N.	Nepali Name	Common Name	Scientific Name
1.	Gharial Gohi	Gharial Crocodile	<i>Gavialis gangeticus</i>
2.	Thotari	Yellow Headed Turtle	<i>Indotestudo elongata</i>
3.	Padani Kachuwa	Pond Turtle	<i>Melanochelys trijuga</i>
4.	Padani Kachhuwa	Tricarinate Hill Turtle	<i>Melanochelys tricarinata</i>
5.	Darkhechuwa	Indian Roofed Turtle	<i>Kachuga tectum</i>
6.	Ajingar	Asiatic Rock Python	<i>Python morulus</i>
7.	Goman	Cobra	<i>Najus naja</i>

ii. Exotic reptiles

S.N.	Nepali Name	Common Name	Scientific Name
1.	Thulo Bhuin Kachuwwa	Giant Land Tortoise	<i>Testudo gigantia</i>
2.	Chhiniya Alligator	Chinese Alligator	<i>Alligatoridae sinensis</i>

B. Exotic fishes

S.N.	Nepali Name	Common Name	Scientific Name
1.	-	Yellow and Blue Artus	<i>Pseudotropheus auratus</i>
2.	-	Tiger Barb	<i>Barbus tetrazona</i>
3.	-	Silver Dollar	<i>Metynnis roosevelti</i>
4.	-	Yellow Sivrum	-
5.	-	Black Tiger Shark	<i>Morulus chrysophekadion</i>
6.	-	White Tiger Shark	-
7.	-	Swordtail Goldfish	-
8.	-	Gold Fish	<i>Carratius auratus</i>
9.	-	Rayking Goldfish	-
10.	-	Radcap Goldfish (Twintail)	-
11.	-	Black Moor Goldfish	-
12.	-	Pearlskill Goldfish	-
13.	-	Subun King	<i>Carrassius spp.</i>
14.	-	Koi and Manila Carp	<i>Cyprinus spp.</i>
15.	-	Blue Gourami	<i>Trichogaster sumatranus</i>
16.	-	Kissing Gouramui	<i>Helostoma temmincki</i>
17.	-	Tinfoil Barb	<i>Barbus schwanenfeld</i>
18.	-	Firemouth	<i>Firemouth cichlid</i>
19.	-	Oskar White	<i>Astronotus ocellatus</i>
20.	-	Koi and Zebra Angel	-
21.	-	Red Oranda	-

C. Birds

i. Native birds

S.N.	Nepali Name	Common Name	Scientific Name
1.	Mayur	Blue Peafowl	<i>Pavo cristatus</i>
2.	Chamcha Hansh	Spoonbill	<i>Palatalea leucorodia</i>
3.	Sawari	White Ibis	<i>Therekiornis melanocephala</i>
4.	Thulo Bakulla	Grey Heron	<i>Ardrea cinerea</i>
5.	Raj Giddha	King Vulture	<i>Torgus calvus</i>
6.	Giddha	Eurasian Vulture	<i>Gyps bengalensis</i>
7.	Saras	Sarus Crane	<i>Grus antigone</i>
8.	Saras	Common Crane	<i>Grus grus</i>
9.	Karyangkurung	Demossile Crane	<i>Anthropoides virgo</i>
10.	Kaloghantiwala Stork	Black Necked Stork	<i>Xenerhynchus asiaticus</i>
11.	Seto Stork	White Stork	<i>Ciconia ciconia</i>
12.	Sano Garud	Lesser Adjutant Stork	<i>Leptoptilos javanicus</i>
13.	Danphe	Impeyan Pheasant	<i>Lophophorus impejanus</i>
14.	Nepali Kalij	Nepali Kaliz	<i>Lophura leucomelana</i>
15.	Chyakhura	Chukor Partridge	<i>Alectoris graeca</i>
16.	Dhanesh	Pied Hornbill	<i>Anthracocercus malabaricus</i>
17.	Rabin	Robin	-
18.	Gulabi Myna	Rosy Pastor	<i>Sternus roseus</i>
19.	Myna	Common Myna	-
20.	Bolne Myna	Talking Myna	-
21.	Lampuchhre	Red Billed Blue Magpie	<i>Urocissa erythrorhyncha</i>
22.	Krishnasir Koter	Black Headed Munia	<i>Lonchura malacca</i>
23.	Lal Koter	Red Munia	<i>Amandava amandava</i>
24.	Setokanthi Koter	White Throated Munia	<i>Lonchura malabarica</i>
25.	Thople Koter	Spotted Munia	<i>Lonchura punctulata</i>
26.	Rato Kanthi Suga	Rose Ringed Parakeet	<i>Psittacula krameri</i>
27.	Karal Suga	Alexandrine Parakeet	<i>Psittacula eupatria</i>
28.	Suga	Red Breasted Parakeet	<i>Psittacula alexandri</i>
29.	Nataka Hans	Comb Duck	<i>Sarkidiornis melanotos</i>
30.	Garampar Hans	Spotbill Duck	<i>Anas poecilorhyncha</i>
31.	Sim Kukhura	Purple Gallinule	<i>Porphyrio porphyrio</i>
32.	Til Hansh	Lesser Whistling Teal	<i>Dendrocygma javanica</i>
33.	Khoya Hans	Bar Headed Goose	<i>Anser indicus</i>
34.	Malewa	Blue Rock Pigeon	<i>Columba livea</i>

S.N.	Nepali Name	Common Name	Scientific Name
35.	Lakka Parewa	Fantail Pigeon	Family : Columbidae
36.	Haleso	Bengal Green Pigeon	<i>Treron phenicoptera</i>
37.	Seto Dhukur	White Dove	<i>Columba sp</i>
38.	Raj Hansh	Comm On Greylag Goose	<i>Anser anser</i>
39.	Pelican Hans	White Pelican	<i>Pelecanus onocrolatus</i>
40.	Hunchil	Great Horned Owl	<i>Bubo bubo</i>
41.	Lato Kosero	Barn Owl	<i>Tyto alba</i>
42.	Chil	Dark Or Black Kite	<i>Milvus migrans</i>
43.	Baj	Falcon	<i>Falcon peregrinus</i>
44.	Baj	Common Kestrel	<i>Falco tinnunculus</i>
45.	Chil	Crested Serpent Eagle	<i>Spilornis cheela</i>

ii. Exotic birds

S.N.	Nepali Name	Common Name	Scientific Name
1.	Setoghantiwala Saras	White Naped Crane	<i>Grus cipio</i>
2.	Seto Kaliz	Silver Pheasant	<i>Lophurea nectinea</i>
3.	Mikado Kaliz	Mikado Kaliz	<i>Syrmaticus mikado</i>
4.	Elliot Kaliz	Elliot Pheasant	<i>Syrmaticus ellioti</i>
5.	Sunaula Kaliz	Golden Pheasant	<i>Chrysolophus pictus</i>
6.	Lady Amherst Kaliz	Lady Amherst Pheasant	<i>Chrysolophus amherstiae</i>
7.	Ostrich	African Ostrich	<i>Struthio camelus</i>
8.	Wood Duck	Wood Duck	<i>Aix sponsa</i>
9.	Japani Bentam	Japanese Bantam	Family: Phasianidae
10.	Hamburg Kukhura	Hamburg Fowl	Family: Phasianidae
11.	Kakatuwa	Pink-Crested Cockatoo	<i>Cacatua moluccensis</i>
12.	Kakatuwa	Sulphur Crested Cockatoo	<i>Kakatoe galerita</i>
13.	Kakatuwa	White Cockatoo	-
14.	Ratosuga	Lorikeet	-
15.	Kaktil	Cockateil	<i>Nymphicus hollandicus</i>
16.	Badgerigar (Bajij)	Budgeriar	<i>Mellopsitacus undulatus</i>
17.	Premi Chara	Love Bird	<i>Agapornis personata</i>
18.	Bhangera	Java Sparrow	<i>Padda oryzovora</i>

4.1.2 An Overview of the existing condition of the central zoo.

Altogether there are 72 plus posts to run the central zoo

- 7 executives including the post of director, central zoo
- 45 field staff
- 11 security
- 9 administration/account and store

72 total no. of staff.

The central zoo maintained properly Rs 20 million (2 crores) income and expenditure budget.

4.1.2.1 Display: The exhibits at central zoo are not based on any display theme. However in the masterplan, care has been well taken to follow the international norms.

4.1.2.2 Physical Facilities:

- **Parking:** Outside the boundary on the northeastern side parking area for vehicles are provided. For employees and central zoo own vehicle the parking area is available in the administrative compound.
- **Entrance:** Entrance and exit for visitors are through the main gate. The main entrance with one big iron gate is occasionally used for VIP vehicles; and two small gates along the southern and northern side of main gate serve as entry and exit point for visitors. There is another gate mainly for staff and guest in the office area. The main entrance houses a ticket window shelters for guards and small room for record keeping and account of daily ticket sale.
- **Walkways:** Walkways are sufficient wide for average number of visitors, concrete pavement, small stone gravel, brick soling have been used for construction. Flowers and green cover along the walkways is insufficient.
- **Exhibits:** Some of the exhibit facilities are very old. The new ones built lack the norms. Some new constructions are up to the mark.



Photograph 4. A commune of spotted deer



Photograph 5. A display board on Hog deer

- **Pond:** Built in the 16th century during the Malla regime, the pond holds approximately 1/5th of the area of the total zoo. Pond water has not been cleaned since over 10 years ago. The pond water is in need of cleaning and proper recycling.
- **Electrification:** In the exhibit area natural illumination has been provided. Artificial lighting is practically nil. There is no back up power or emergency power.
- **Water supply:** Water supply is from water supply corporation through seven connections, connected with several surface and underground water tanks. There is no provision for water treatment and recycling of water.
- **Banners and signs:** Conventional type of banners and signs has been used in central zoo exhibits.

4.1.2.3. Services: Apart from display of exhibit the central zoo offers following services to visitors.

- i. Children play ground with various playing equipment i.e. slide, swings, rotating chairs, see-saw, merry go round in a garden with benches and resting chairs.
- ii. Zoo restaurant
- iii. Souvenir shop
- iv. Paddle boat and rafting
- v. Picnic shed
- vi. Elephant ride and
- vii. Fishing

4.1.2.4. Communications: No proper internal communication exists, except a few phone links and mobiles. There is no provision of electronic surveillance and public announcement except during Bhote Jatra festival.

4.1.2.5 Administration: Situated at northeastern part of central zoo premises. The administration area has a separate gate, parking area and surrounded by a compound formerly a part of radio Nepal. It has offices of;

- i. Office of director of zoo
- ii. Office of animal management and conservation education
- iii. Office of administration and finance
- iv. Visitors' center
- v. Library and
- vi. Veterinary structure.

4.1.2.6. Education: Visitor center located within the administration area serve for educational facility and also for holding meetings, seminars and workshop. This center is equipped with audiovisual facility. Presently the central zoo offers two types of conservation education to schoolchildren and to members of friends of central zoo. Sometime on the request of friends of central zoo some program for non-member is also offered like slide and video shows, zoo-guided tour, zoo treasure walk and zoo patrol volunteer programme. Educational programme at central zoo also includes:

1. Wildlife essay competition
2. Wildlife drawing competition
3. Quiz competition
4. Educational tour to national parks
5. Winter day camp
6. Summer camp
7. Animal feeding at central zoo
8. Zoo news letter publication (3 publication/year)



Photograph 6. A resting male hog deer

4.1.2.7. Training: Central zoo sends its staff for training to Jersey (U.K.), and for basic training to India. International student exchange program of central zoo also helps to train staff, short term training on bird watching, aquarium management, Vermi-composting training is provided to member of friends of zoo, is offered by central zoo.

4.1.2.8. Husbandry and Veterinary care: American Zoo and Aquarium Association (AZA) along with Conservation Breeding Specialist Groups and Species Survival Committee (CBSG/SSC) of world conservation union (IUCN) have set up minimum husbandry practice of zoos based on generally accepted zoo requirements. Central zoo is committed to follow the "Animal Welfare Minimum Standards" set by South Asian Zoos Association for Regional Cooperation (SAZARC). Exhibits should provide the amount of space necessary to promote natural and normal behavior within the social group.



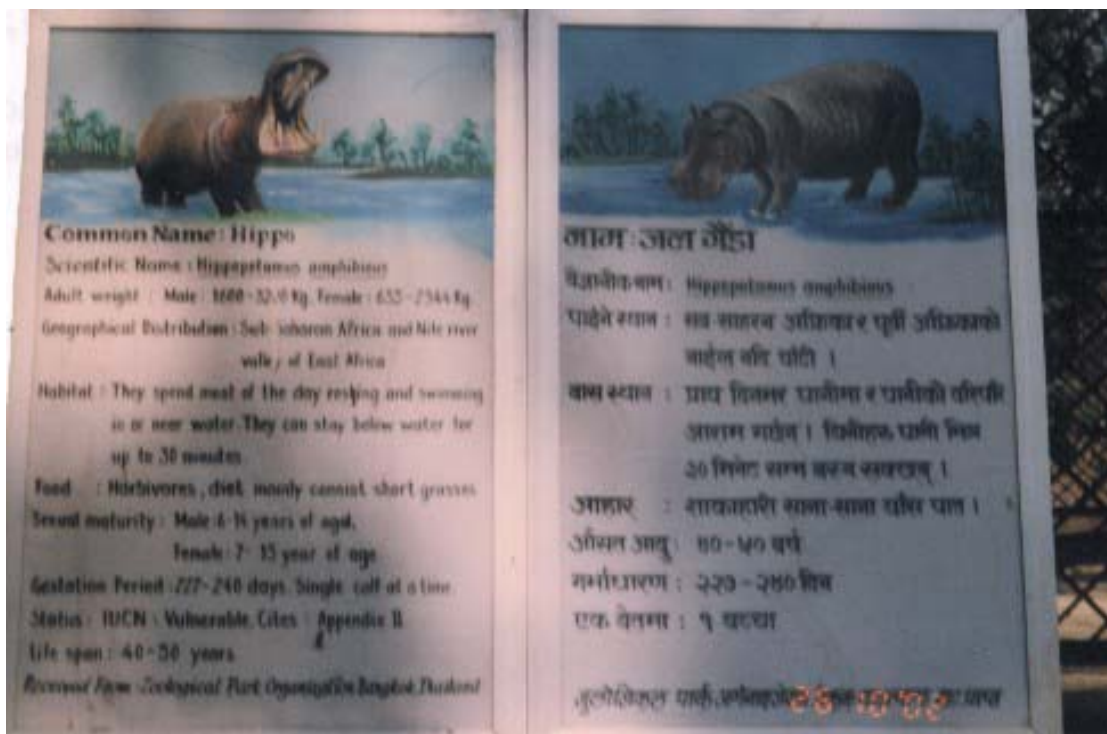
Photograph 7. A board with directions for the visitors

4.1.2.9. Enclosure requirement: Enclosure should be designed and constructed of suitable materials and should be structurally sound. Enclosures constructed should have no sharp points or edges, should be free of rust, should protect animals from injury, prevent accidental escape and keep unwanted animals or humans away. Carrying capacity of each enclosure should be considered.

4.1.2.10. Exhibit size: Enclosure size depends upon minimum husbandry standards of different exhibits.

4.1.2.11. Exhibit furnishing: Some animals are extremely destructive and attempt to disseminate or chew apart any object inside. Furnishing depends on the species of animals. Cages should be furnished with horizontal pathways, shelves and comfortable perches above floor level. In some enclosures swings, ropes crossed and tied to different angles, non-toxic artificial or natural tree branches should be provided. The use of hay/straw on the floor for some animals is also required

4.1.2.12. Enrichment: An appropriate plan for environmentally enriching the enclosure is needed to promote the psychological well being of animals. The plan must be in accordance with currently accepted professional standards and as directed by attending veterinarian.



Photograph 8: A display board on newly acquired Hippopotamus.

4.1.2.13. Environmental requirement: The following environment requirements should be followed at all times. This requirement differs from species to species of animals and birds:

- | | | |
|----------------|--------------|-------------------------------|
| i. Temperature | ii. Lighting | iii. Ventilation and humidity |
| iv. Food | v. Water | vi. Sanitation |

4.1.2.14. Veterinary care: Services of experienced veterinarian and paraveterinary staffs trained to treat wild animals should be available. Periodic (minimum twice a year) faecal examination and cultures should be completed twice a year and pathogenic findings be treated accordingly. Chronic diarrhoea (more than two times a day) may require veterinary intervention. Annual intradermal tuberculin tests should be performed. Annual health assessment should include a thorough physical examination including dental examination, blood collection, radiograph if possible and rectal culture for certain pathogenic bacteria. Body weight should be reviewed whenever chance arises. For large animals upper respiratory tract infection and digestive system bacterial cultures be monitored. Proper quarantine procedures must be followed for new arrivals.

4.2. Assessment Five Freedoms of animals at the central zoo, Kathmandu

The assessment of five freedoms was based on visual observations according to parameters of assessment for different freedoms of animals. The following sections present the observations made during the assessment of five freedoms of animals in the central zoo. The detailed checklist prepared during assessment is presented in the annexe.

4.2.1. Provision of food and water

Table No 1 to 6 and Graph No.1 to 6 below present the conditions of the animals of the central zoo with regard to provision of food and water.

- **Native Mammals**

Being native to Nepal, the zoo is able to suffice the dietary requirement of each native mammals of the central zoo i.e. preserve the unique dietary requirements of the animals. All the native mammals receive (100%) species specific diet. Most of them are fed following safe methods that simulate their natural feeding behaviour. However there have been constraints regarding control of indiscriminate feeding and pestering of animals by the visitors. (See table 1 and graph no. 1).



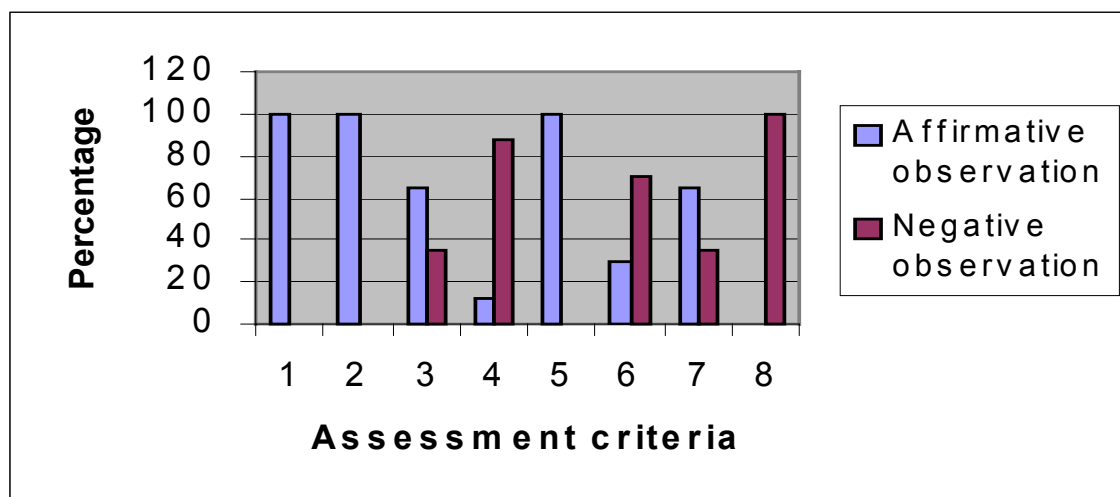
Photograph 9: A Monkey holds ready a visitor's offerings.



Photograph 10: Lonesome Falcon on a perch

Table No. 1: Parameters for assessment of adequate provision of food and water for native mammals and the observations

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Animals receiving species specific diet	17	100	0	0.0
2.	Provision of drinking water	17	100	0	0.0
3.	Natural feeding catered for	11	64.71	6	35.29
4.	Multiple feeding stations for group animals	2	11.76	15	88.24
5.	Safe feeding methods	17	100	0	0.0
6.	Hygienic food/ water provided	5	29.41	12	70.59
7.	Feed provided multiple times daily	11	64.71	6	35.29
8.	Provision of controlled feeding by visitors	0	0.00	17	100.00



Graph 1. Assessment of adequate provision of food and water for native mammals

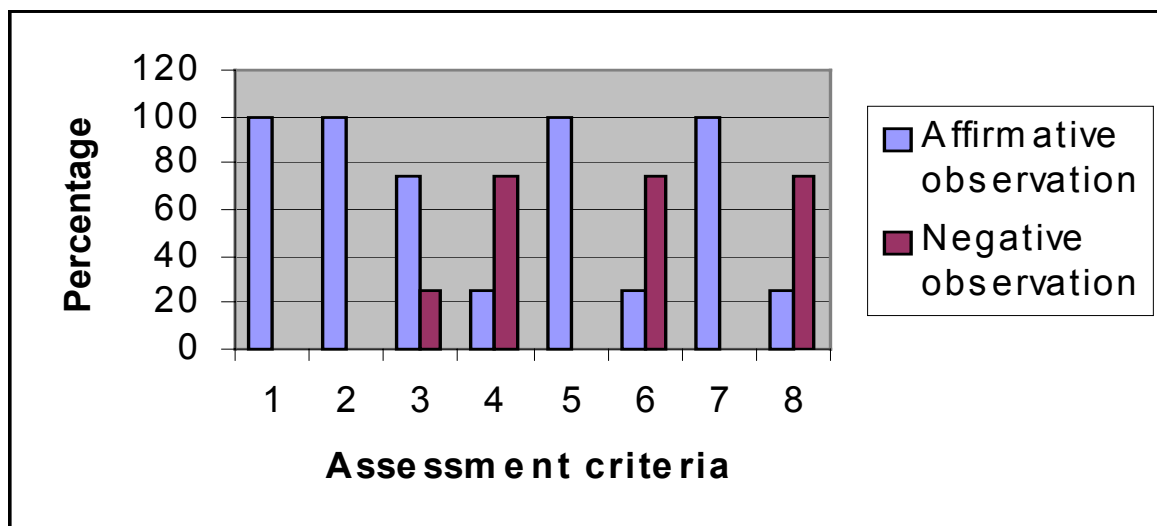
- Exotic Mammals**

Exotic mammals receive more attention and are more prized collection of the central zoo therefore these mammals enjoy better care and attention than their native counterparts. Though the zoo is able to suffice the species-specific dietary requirement of all four exotic mammals but simulating conditions to preserve the natural feeding habits has been difficult. Feeding methods are safe however the provision for multiple feeding stations for gregarious animals is

lacking and so is the need to control indiscriminate feeding by visitor which also often leads to pestering and enraging the animals housed. The Table 2 and Graph 2. below give a brief insight into the conditions of exotic animals regarding the provision of food and water.

Table No. 2: Parameters for assessment of adequate provision of food and water for exotic mammals and the observations

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Animals receiving species specific diet	4	100	0	0
2.	Provision of drinking water	4	100	0	0
3.	Natural feeding catered for	3	75	1	25
4.	Multiple feeding stations for group animals	1	25	3	75
5.	Safe feeding methods	4	100	0	0
6.	Hygienic food/ water provided	1	25	3	75
7.	Feed provided multiple times daily	4	100	0	0
8.	Provision of controlled feeding by visitors	1	25	3	75



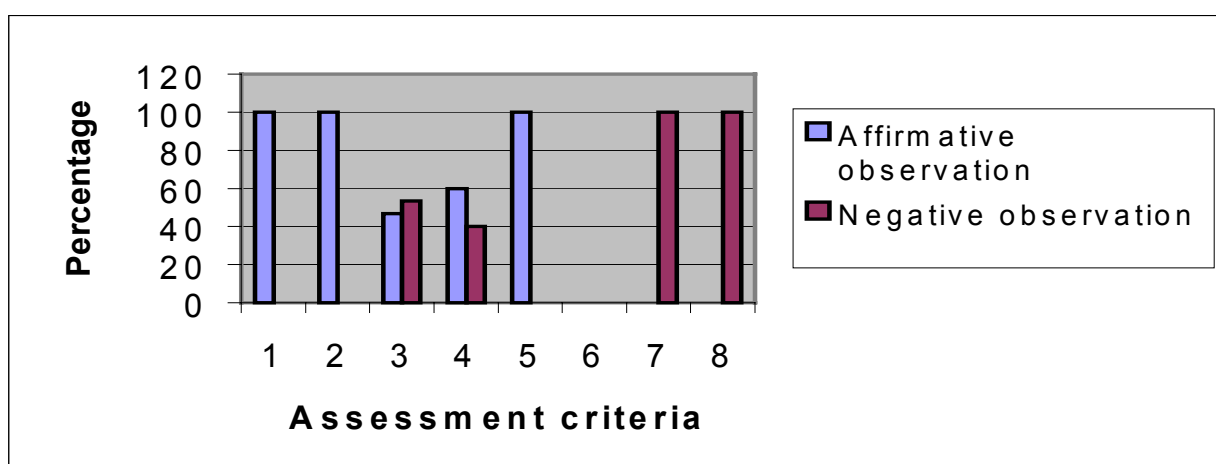
Graph 2. Assessment of adequate provision of food and water for exotic mammals

- **Native Birds**

The Table and Graph no 3 shows the assessments of provision of feed and water for native birds. As shown in the table there have been provisions to suffice almost all the parameters laid down. Even the multiple feeding stations have been laid down taking into account the group feeding behaviour. However there have been restrictions in provision of feed. No provision exists for feeding the birds multiple times daily.

Table No. 3: Parameters for assessment of adequate provision of food and water for native birds and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Animals receiving species specific diet	15	100	0	0
2.	Provision of drinking water	15	100	0	0
3.	Natural feeding catered for	7	46.67	8	53.33
4.	Multiple feeding stations for group animals	9	60	6	40
5.	Safe feeding methods	15	100	0	0.00
6.	Hygienic food/water provided	-		-	
7.	Feed provided multiple times daily	0	0	15	100
8.	Provision of controlled feeding by visitors	0	0	15	100

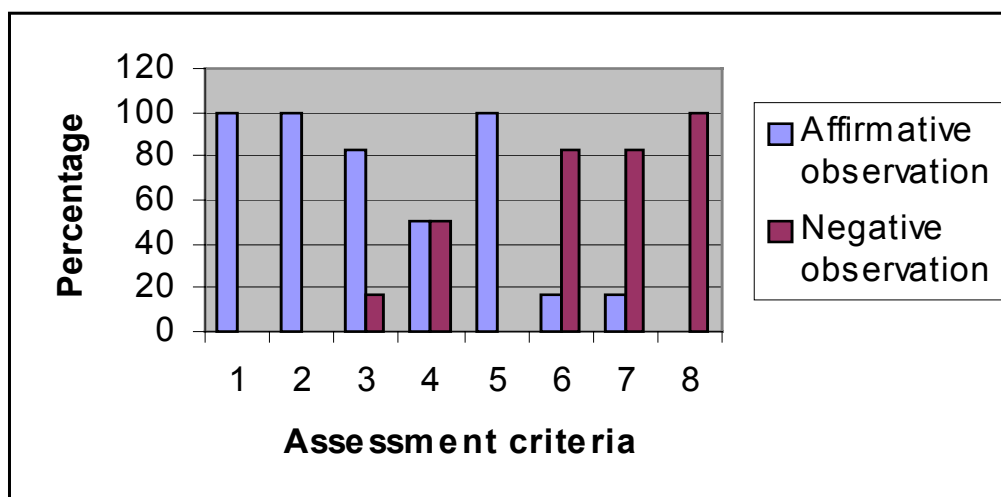


Graph 3. Assessment of adequate provision of food and water for native birds

- **Exotic Birds**

Table No. 4: Parameters for assessment of adequate provision of food and water for exotic birds and the observations

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Animals receiving species specific diet	6	100	0	0
2.	Provision of drinking water	6	100	0	0
3.	Natural feeding catered for	5	83.33	1	16.67
4.	Multiple feeding stations for group animals	3	50.00	3	50.00
5.	Safe feeding methods	6	100	0	0
6.	Hygienic food/ water provided	1	16.67	5	83.33
7.	Feed provided multiple times daily	1	16.67	5	83.33
8.	Provision of controlled feeding by visitors	0	0	6	100



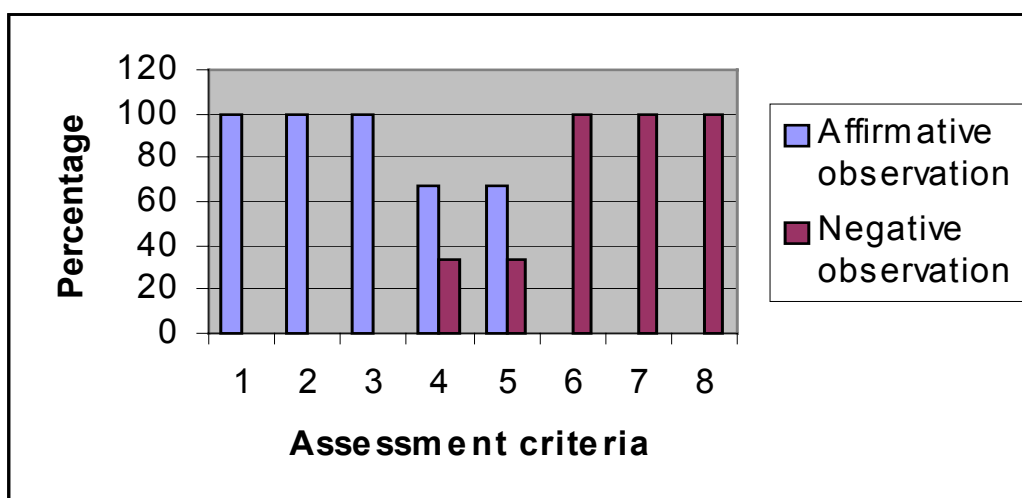
Graph 4. Assessment of adequate provision of food and water for exotic birds

- **Native reptiles**

Table No. 5: Parameters for assessment of adequate provision of food and water for native reptiles and the observations

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Animals receiving species specific diet	3	100	0	0.00

2.	Provision of drinking water	3	100	0	0.00
3.	Natural feeding catered for	3	100	0	0.00
4.	Multiple feeding stations for group animals	2	66.67	1	33.33
5.	Safe feeding methods	2	66.67	1	33.33
6.	Hygienic food/ water provided	0	0.00	3	100.00
7.	Feed provided multiple times daily	0	0.00	3	100.00
8.	Provision of controlled feeding by visitors	0	0.00	3	100.00



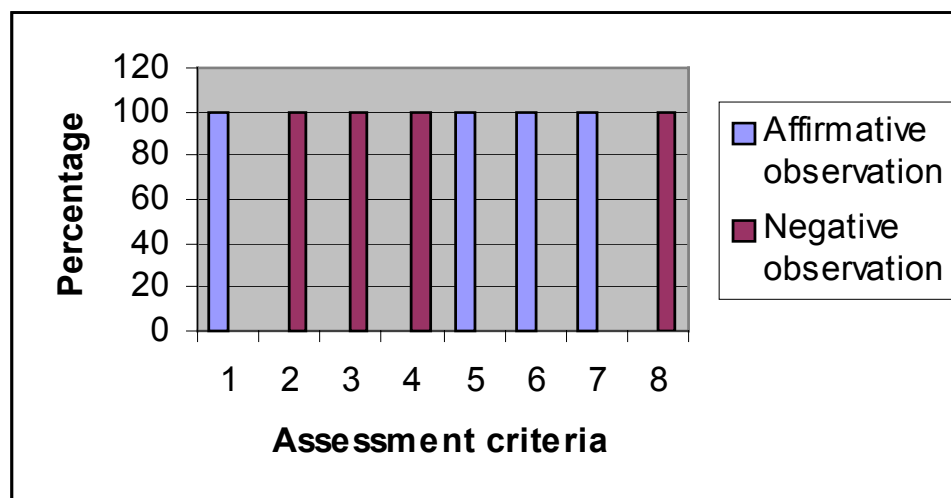
Graph 5. Assessment of adequate provision of food and water for native reptiles

- Aquarium**

Table No. 6: Parameters for assessment of adequate provision of food and water for fishes in the aquarium and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Animals receiving species specific diet	1	100	0	0.00
2.	Provision of drinking water	0	0.00	1	100
3.	Natural feeding catered for	0	0.00	1	100
4.	Multiple feeding stations for group animals	0	0.00	1	100

5.	Safe feeding methods	1	100	0	0.00
6.	Hygienic food/ water provided	1	100	0	0.00
7.	Feed provided multiple times daily	1	100	0	0.00
8.	Provision of controlled feeding by visitors	0	0.00	1	100



Graph 6: Assessment of adequate provision of food and water for fishes in the aquarium

4.2.2 Provision of suitable environment

Table No 7 to 13 and Graph No.7 to 13 below presents the conditions of the animals of the central zoo with regard to provision of suitable environment.

- Native mammals**

The native mammals are housed in cages usually the single ones or that are potentially dangerous for public safety e.g. sloth bear, usually the harmless and group animals as Cheetal are housed open enclosures to provide them enough space and shelters. Zoo is relatively small and density of animals housed exceeds the norms of space required, therefore the caged conditions coupled with inflow of visitors makes the zoo noisier and with lesser space.

Only 47% of native mammals enjoy appropriate lighting, temperature and ventilation. 64% of the animals housed have the liberty of outside access i.e. to move in and around the open enclosures and almost 94% of animals enjoy sufficient shelters.



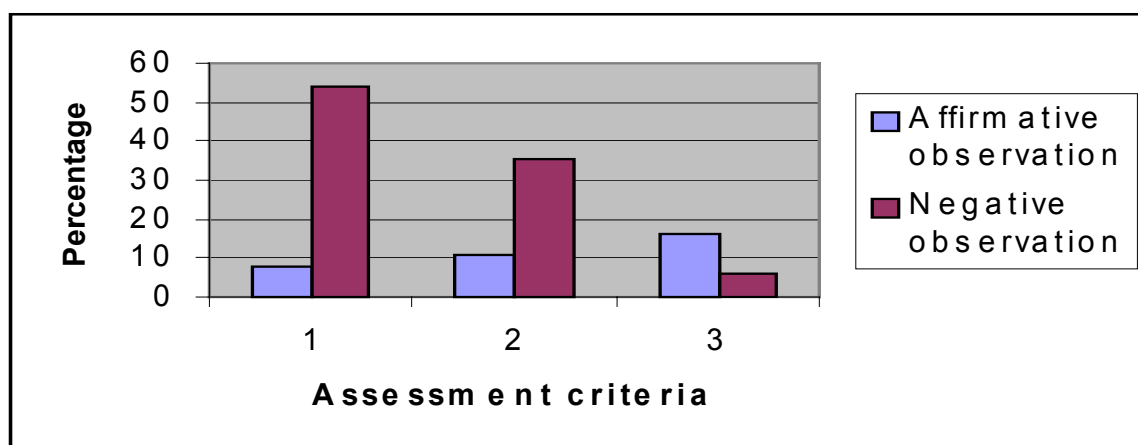
Photograph 11: A display board on Sloth Bear



Photograph 12: A Sloth Bear in its enclosure

Table no 7. Observations made during assessment of native mammals' enclosure for adequate environment.

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Appropriate temperature, ventilation, lighting and noise levels.	8	47.06	9	53.94
2.	Outside access provided	11	64.71	6	35.29
3.	Sufficient shelter	16	94.12	1	5.88



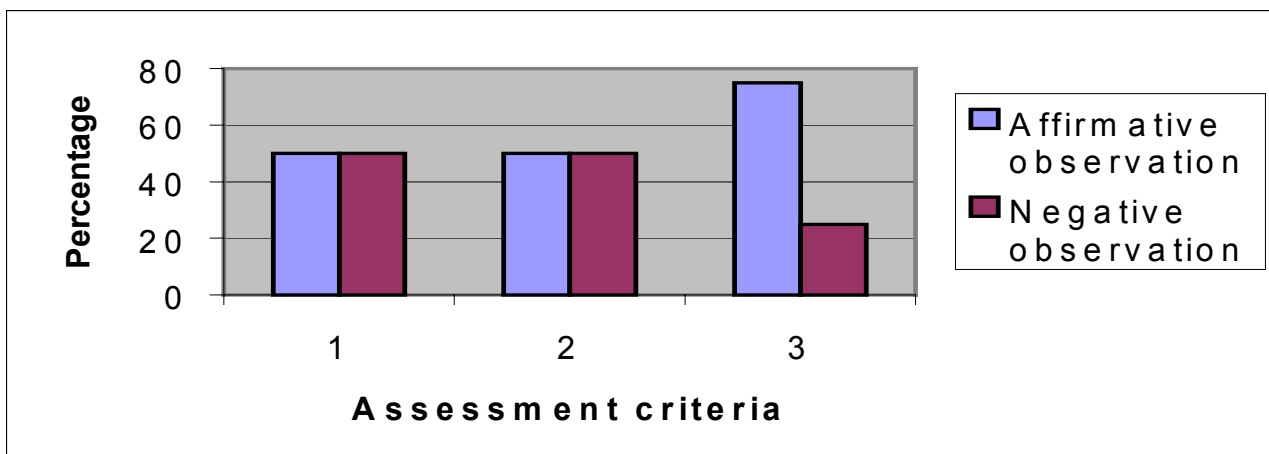
Graph no 7. Assessment observations of native mammals' enclosure for adequate environment.

- Exotic mammals**

Besides newly acquired hippopotamus, most of the exotic mammals are caged with adequate space, sufficient shelter and access to outside area. See table no 8 and graph 8.

Table no 8. Observations made during assessment of exotic mammals' enclosure for adequate environment.

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Appropriate temperature, ventilation, lighting and noise levels.	2	50	2	50
2.	Outside access provided	2	50	2	50
3.	Sufficient shelter	3	75	1	25



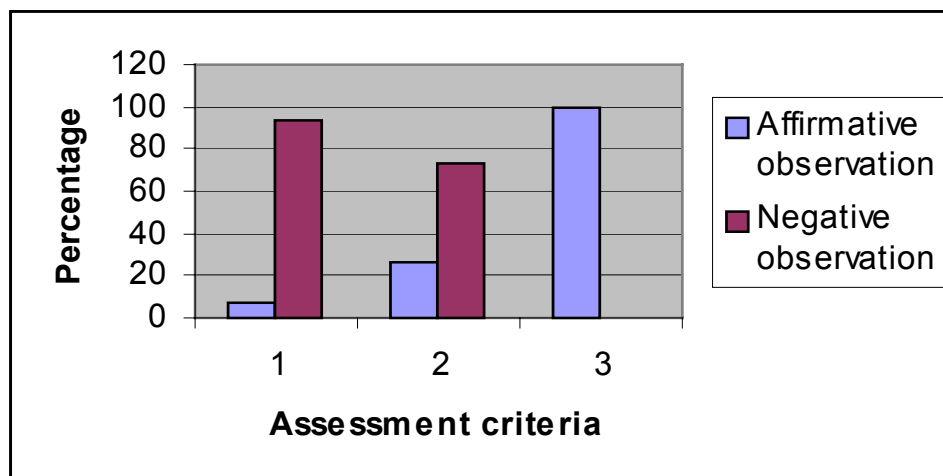
Graph no 8. Observations made during assessment of exotic mammals' enclosure for adequate environment.

- Native birds**

While most of the birds are kept in cages and closed aviaries, some of the birds such as Raj Hans, Pelican are kept in open spaces with no enclosed restrictions. Caged birds are disadvantaged with regard to species specific temperature, ventilation, lighting and noise levels, they have little movement space compared to their natural habits but have sufficient shelter to serve as nests (see table and graph no 9).

Table no 9. Observations made during assessment of native birds' enclosure for adequate environment.

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Appropriate temperature, ventilation, lighting and noise levels.	1	6.67	14	93.33
2.	Outside access provided	4	26.67	11	73.33
3.	Sufficient shelter	15	100	0	0.0



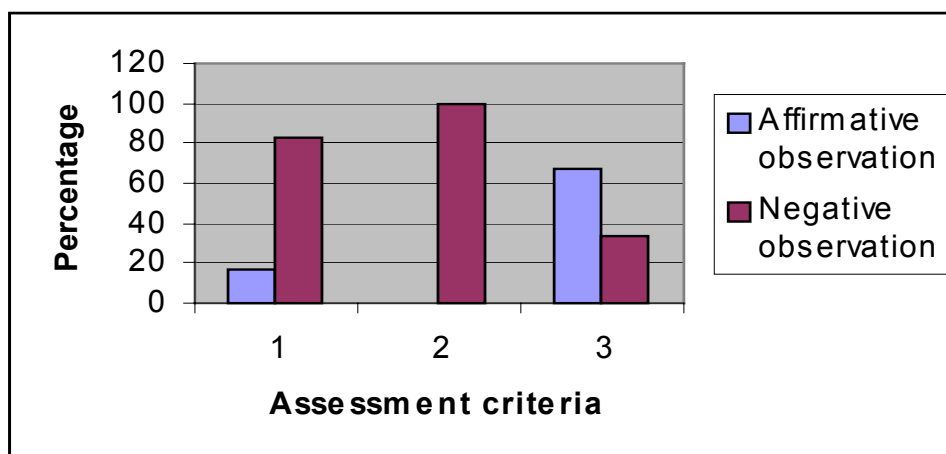
Graph no 9: Observations made during assessment of native birds' enclosure for adequate environment.

- **Exotic birds**

Excepting for ostrich, all exotic birds are kept in cages and are in need of better management regarding appropriate temperature, ventilation, lighting and noise levels. However they enjoy enough shelter to nest (see table 10 and graph 10)

Table no 10. Observations made during assessment of exotic birds' enclosure for adequate environment.

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Appropriate temperature, ventilation, lighting and noise levels.	1	16.67	5	83.33
2.	Outside access provided	0	0.00	6	100
3.	Sufficient shelter	4	66.67	2	33.33



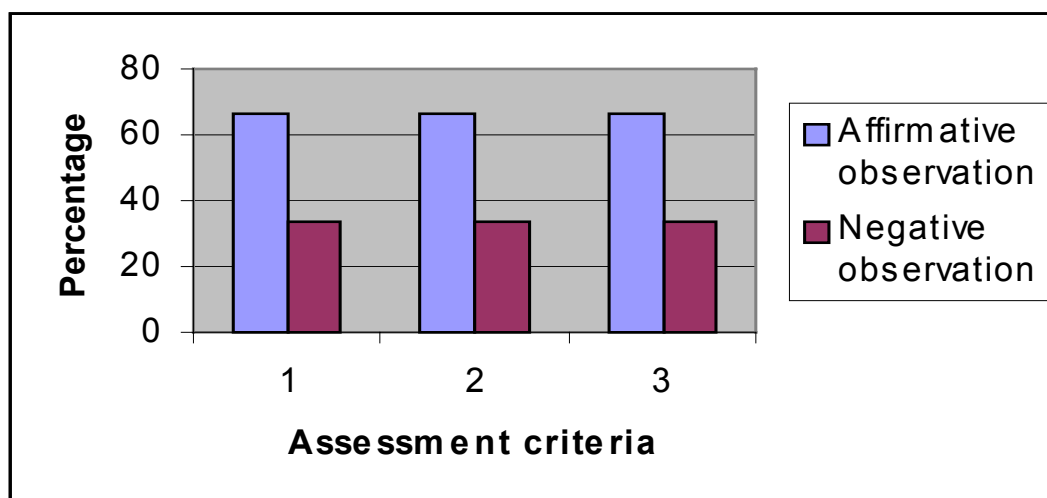
Graph no 10. Observations made during assessment of exotic birds' enclosure for adequate environment.

- **Native reptiles**

Central zoo's housed native reptiles include Gharial crocodiles, turtle and snakes. Enough attention has been given to these animals with regard to provision of suitable environment. While Gharials have been housed in open enclosures with enough artificial thatched hut shade for resting, cobras and python are caged and provided with artificial lighting and ventilation. Reptiles have been provided with better environment than average animals (see table 11 and graph 11)

Table no 11. Observations made during assessment of native reptiles' enclosure for adequate environment.

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Appropriate temperature, ventilation, lighting and noise levels.	2	66.67	1	33.33
2.	Outside access provided	2	66.67	1	33.33
3.	Sufficient shelter	2	66.67	1	33.33



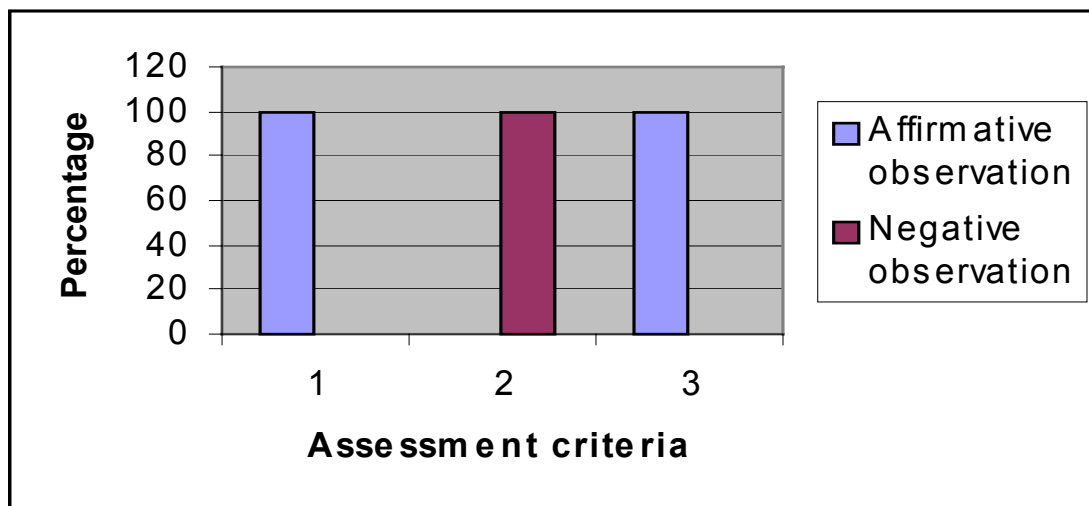
Graph no 11. Observations made during assessment of native reptiles' enclosure for adequate environment.

- **Aquarium**

The aquarium houses different species of fishes (see checklist). The aquariums have been maintained with sophisticated equipment to maintain suitable aquatic environment. There is adequate provision of temperature, ventilation, lighting and noise levels and shelter (see table and graph no 12).

Table no 12. Observations made during assessment of aquarium for adequate environment.

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Appropriate temperature, ventilation, lighting and noise levels.	1	100	0	0.00
2.	Outside access provided	0	0.00	1	100
3.	Sufficient shelter	1	100	0	0.00



Graph no 12. Observations made during assessment of aquarium for adequate environment.

4.2.3. Provision of opportunity to express normal behaviour

Table No 13 to 18 and Graph No.13 to 18 below present the conditions of the animals of the central zoo with regard to provision of opportunity to express normal behaviour.

- Native Mammals**

The zoo has not been able to maintain a suitable environment for the native mammals with regard to provision of necessary environment and opportunity to express normal behaviour. Table and graph no 13 below present the observations made with regard to assessment of provision for opportunity to express normal behaviour.

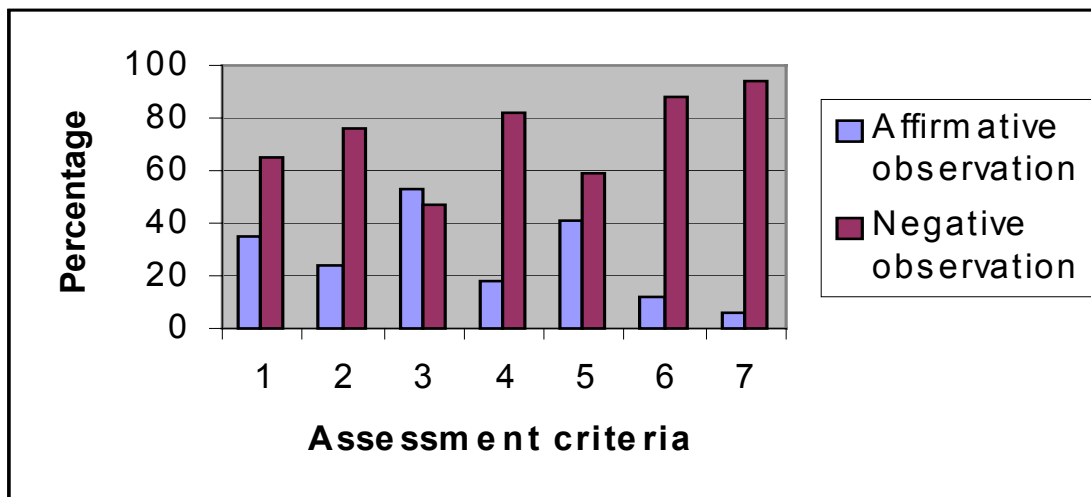


Photograph 13: A Langur in its artificially enriched enclosure

For some species like the Royal Bengal Tiger expensive enclosures and enriched environment has been created like open spaces, cesspools, ponds and dens, similarly rope perches and trees have been maintained for monkeys however most of the cages suffer from lack of suitable enrichments and environment to simulate their natural behavioural needs (see table 13).

Table 13: Parameters for assessment of adequate provision of opportunity to express normal behaviour for native mammals and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Accommodation caters to adequately to biological and behavioural needs of the animals	6	35.29	11	64.71
2.	Complexity of animals' environment	4	23.53	13	76.47
3.	Animals housed in appropriate social group	9	52.94	8	47.06
4.	Enriched environments	3	17.65	14	82.35
5.	Appropriate cage furnishings provided	7	41.18	10	58.82
6.	Appropriate renewal of cage furnishings	2	11.76	15	88.24
7.	Signs of stereotypical/self directed behaviours in animals	1	5.88	16	94.12



Graph no. 13: Observations made during assessment of adequate provision of opportunity to express normal behaviour for native mammals

- **Exotic Mammals**

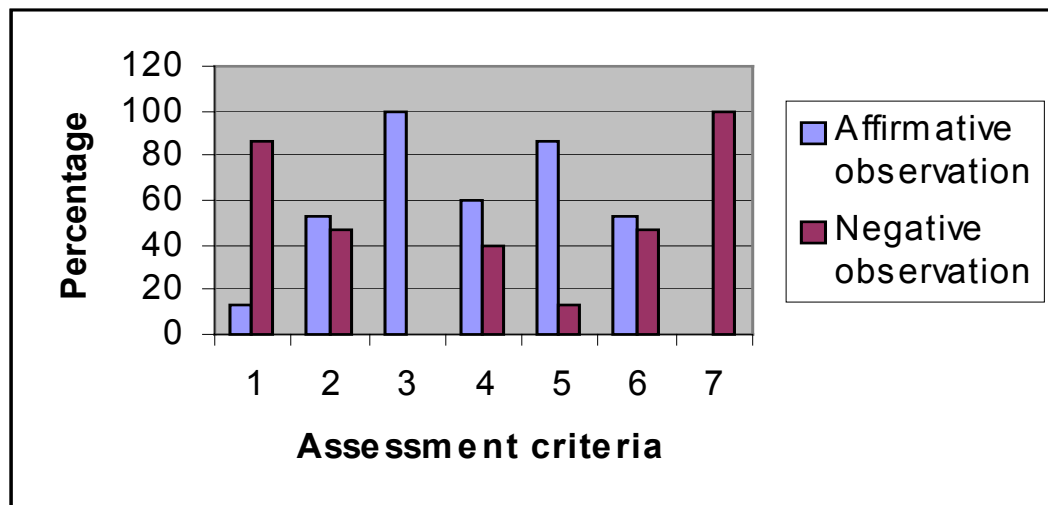
Though the exotic mammals have been provided with better environment than their native counterparts, all exotic animals do not have suitable environments to cater to their natural habits with regard to space and enrichments. However most animals do enjoy appropriate environment simulating their natural habitats and habits. The following table and graph show the observations.



Photograph 14. A leopard yawns in its cage.

Table No. 14. Parameters for assessment of adequate provision of opportunity to express normal behaviour for exotic mammals and the observations

S.N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Accommodation caters to adequately to biological and behavioural needs of the animals	2	13.33	13	86.67
2.	Complexity of animals' environment	8	53.33	7	46.67
3.	Animals housed in appropriate social group	15	100	0	0.0
4.	Enriched environments	9	60	6	40
5.	Appropriate cage furnishings provided	13	86.67	2	13.33
6.	Appropriate renewal of cage furnishings	8	53.33	7	46.67
7.	Signs of stereotypical /self directed behaviours in animals	0	0.0	15	100



Graph no. 14: Observations made during assessment of adequate provision of opportunity to express normal behaviour for exotic mammals

- **Native Birds**

The table no 15 and graph no 15 below show the observations regarding provision of opportunity to express normal behaviour for native birds. Though aviaries and cages are small efforts have been made to enrich the environments to cater to the natural habits of the birds.

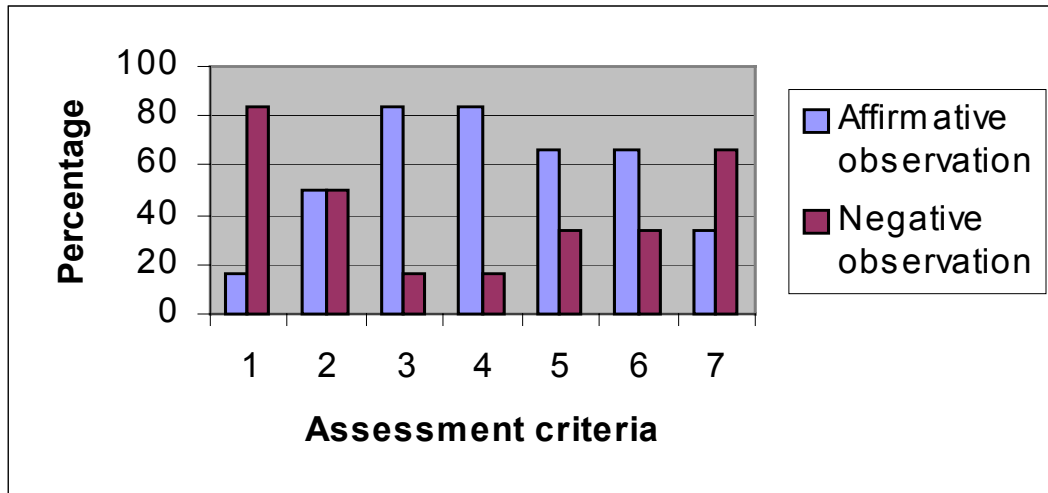


Photograph 15. A peacock in its enclosure.

Trees, perches and other provisions have been made and appropriate cage furnishings have been provided in most cases in an effort to make complex the environment. However, 33.33% of the birds show self directed or stereotypical behaviours necessitating appropriate intervention from the zoo management.

Table 15: Parameters for assessment of adequate provision of opportunity to express normal behaviour for native birds and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Accommodation caters to adequately to biological and behavioural needs of the animals	1	16.67	5	83.33
2.	Complexity of animals' environment	3	50.00	3	50.00
3.	Animals housed in appropriate social group	5	83.33	1	16.67
4.	Enriched environments	5	83.33	1	16.67
5.	Appropriate cage furnishings provided	4	66.67	2	33.33
6.	Appropriate renewal of cage furnishings	4	66.67	2	33.33
7.	Signs of stereotypical /self directed behaviours in birds	2	33.33	4	66.67



Graph no. 15: Observations made during assessment of adequate provision of opportunity to express normal behaviour for native birds

- **Exotic Birds**

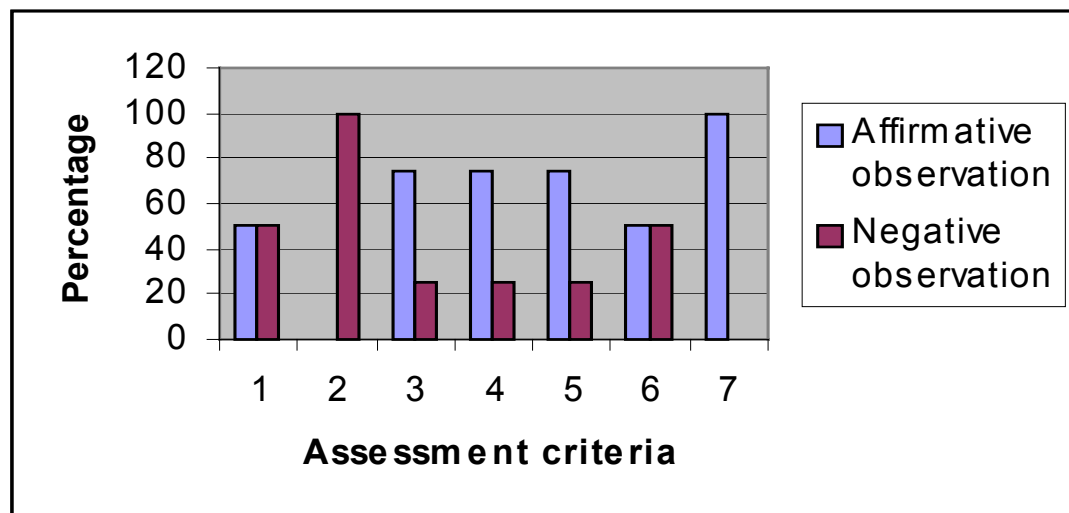
Exotic birds have better provision of opportunities to express their normal behaviour than their native counterparts. The table and graph below present the observations.



Photograph 16: Spoonbills in their enclosure.

Table No. 16: Parameters for assessment of adequate provision of opportunity to express normal behaviour for exotic birds and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Accommodation caters to adequately to biological and behavioural needs of the animals	2	50	2	50
2.	Complexity of animals' environment	0	0	4	100
3.	Animals housed in appropriate social group	3	75	1	25
4.	Enriched environments	3	75	1	25
5.	Appropriate cage furnishings provided	3	75	1	25
6.	Appropriate renewal of cage furnishings	2	50	2	50
7.	Signs of stereotypical /self directed behaviours in animals	0	100	4	0



Graph no. 16: Observations made during assessment of adequate provision of opportunity to express normal behaviour for exotic birds.

- **Native Reptiles**

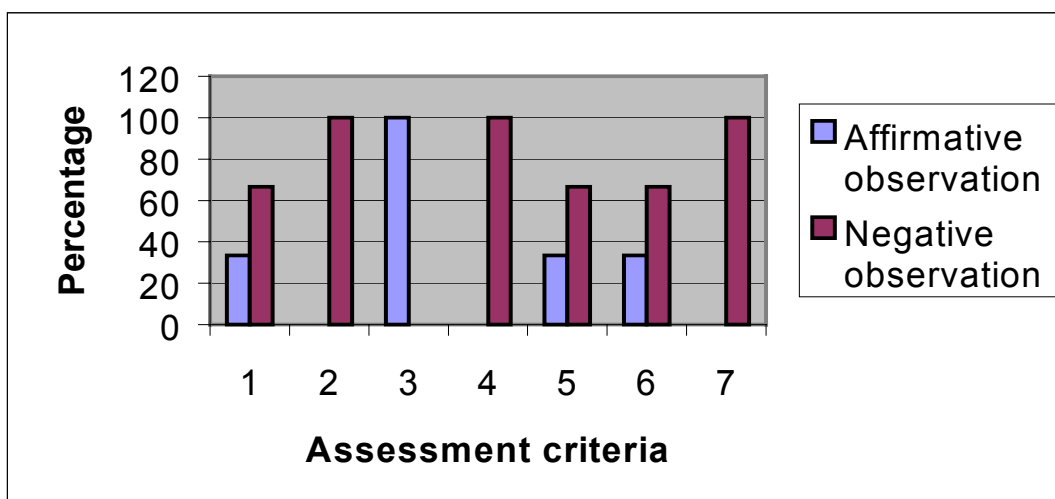
As shown in Table no 17 and graph 17, the native reptiles with few exceptions are housed in poor environments with regard to their natural habits and habitats and no provision for enrichment of their cage or enclosure environments.



Photograph 17. A crocodile by the side of enclosures' 'greenish' pond.

Table No. 17. Parameters for assessment of adequate provision of opportunity to express normal behaviour for native reptiles and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Accommodation caters to adequately to biological and behavioural needs of the animals	1	33.33	2	66.67
2.	Complexity of animals' environment	0	0.00	3	100.00
3.	Animals housed in appropriate social group	3	100.00	0	0.00
4.	Enriched environments	0	0.00	3	100.00
5.	Appropriate cage furnishings provided	1	33.33	2	66.67
6.	Appropriate renewal of cage furnishings	1	33.33	2	66.67
7.	Signs of stereotypical /self directed behaviours in animals	0	0.00	3	100.00



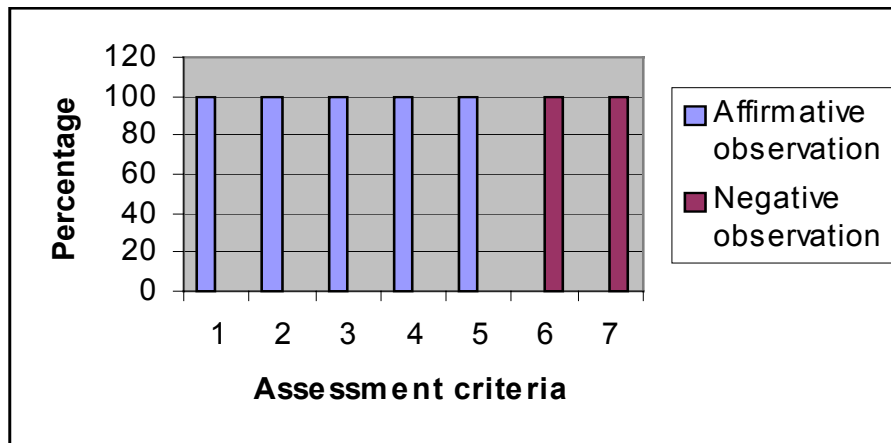
Graph no. 17: Observations made during assessment of adequate provision of opportunity to express normal behaviour for native reptiles.

- Aquarium**

The modern aquarium ensures provision for appropriate environment simulating the natural environment for fishes housed in the aquarium. The accommodation adequately caters to the biological and behavioural needs of the fishes. The aquarium has appropriate furnishings and complexity of the aquarium's environment has also been maintained (table and graph no 17).

Table No. 18: Parameters for assessment of adequate provision of opportunity to express normal behaviour for fishes in the aquarium and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Accommodation caters to adequately to biological and behavioural needs of the animals	1	100	0	0.00
2.	Complexity of animals' environment	1	100	0	0.00
3.	Animals housed in appropriate social group	1	100	0	0.00
4.	Enriched environments	1	100	0	0.00
5.	Appropriate cage furnishings provided	1	100	0	0.00
6.	Appropriate renewal of cage furnishings	0	0.00	1	100
7.	Signs of stereotypical /self directed behaviours in animals	0	0.00	1	100



Graph no. 18: Observations made during assessment of adequate provision of opportunity to express normal behaviour for fishes in the aquarium.

4.2.4. Provision of protection from fear and distress

Table no. 19 to 24 and Graph no.19 to 24 below present the conditions of the animals of the central zoo with regard to provision of protection from fear and distress.

- **Native Mammals**

Table and graph no 19 below show the provision of protection from fear and distress for native mammals. Provisions have been made for prevention of stressful interaction between animals and between animals housed and public by keeping aggressive and dominant animals in separate enclosures and facility to retreat from public view.



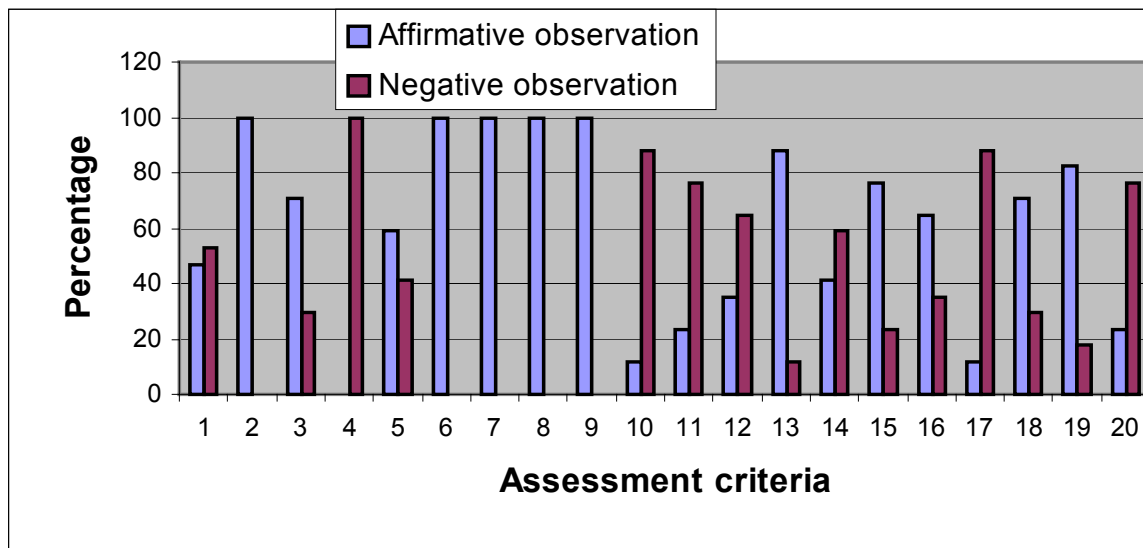
Photograph 18: One of the zoo's prized collection -Nepal's One Horned Rhino at its feeding spot.

Enough visual screenings have been provided for animals in adjacent cages. However, no escape routes are made available in enclosures with group animals to facilitate escape of subordinate animals during aggression by the dominant animals of the group. A fair percentage of stressful interactions among animals have also been noted (table 19).

Table No. 19: Parameters for assessment of adequate provision of protection from fear and distress for native mammals and the observations

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
1.	Effective prevention of contact between public and animals		8	47.06	9	52.94
2.	Effective visual screening between adjacently housed species		17	100	0	0.00
3.	Facility to retreat from public view		12	70.59	5	29.41
4.	Escape routes for subordinate animals		0	0.00	17	100
5.	Presence of stressful interactions		10	58.82	7	41.18
6.	Availability of 3-D space for use by animals		17	100	0	0
7.	Animals are shut	Onto exhibit for 1 day	17	100	0	0
8.		For the night	17	100	0	0
9.		Sufficient shade	17	100	0	0
10.		On natural substrates	2	11.76	15	88.24
11.		Sufficient nesting boxes	4	23.53	13	76.47
12.		Bathing areas	6	35.29	11	64.71
13.		Adequate bedding	15	88.24	2	11.76
14.		Safe furnishings	7	41.18	10	58.82
15.	Sufficient space in the enclosures		13	76.47	4	23.53
16.	Satisfactory cleaning of enclosures		11	64.71	6	35.29
17.	Adequate maintenance of		2	11.76	15	88.24

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
	buildings and fences				
18.	Effective to contain animals enclosed	12	70.59	5	29.41
19.	Enclosure safe for the animals	14	82.35	3	17.65
20.	Adequate drainage in the enclosures	4	23.53	13	76.47



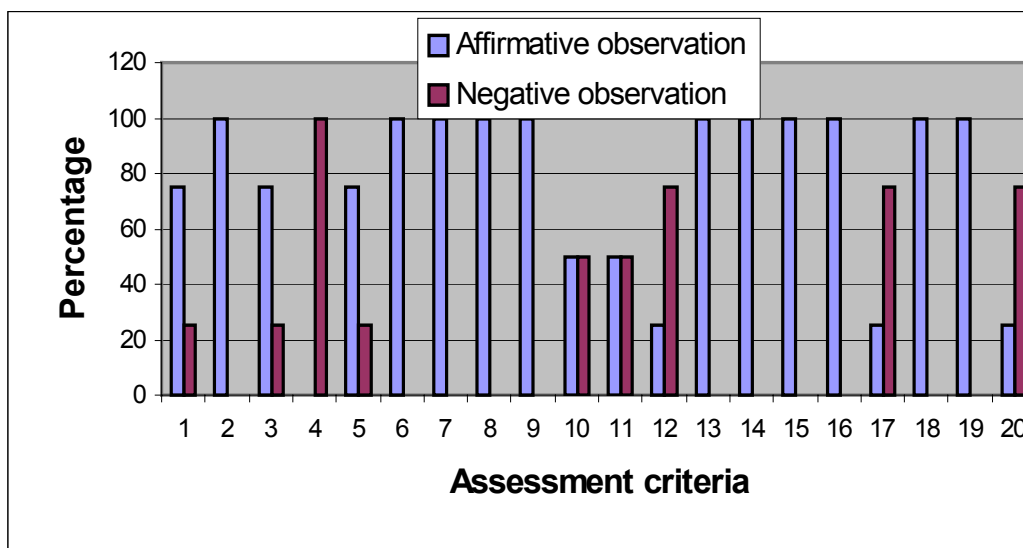
Graph no. 19: Observations made during assessment of protection from fear and distress for native mammals

B. Exotic Mammals

The exotic mammals are also housed similarly with regard to provision of protection from fear and distress. Arrangements in enclosure and cage architecture are such that there is minimal conflict between adjacently housed species also with the public (Table 20, assessment criteria 1 through 3). Not enough provisions have been made to evade stressful interactions that often occur in-group animals neither are there enough escape routes for subordinate animals. Attendants' intervention is often required in acts of aggressions by dominant animals in the enclosures. However the enclosures are effective in containing animals as well as safe. However the cleaning and maintenance of buildings is not satisfactory.

Table No. 20: Parameters for assessment of adequate provision of protection from fear and distress for exotic mammals and the observations

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
1.	Effective prevention of contact between public and animals		3	75	1	25
2.	Effective visual screening between adjacently housed species		4	100	0	0
3.	Facility to retreat from public view		3	75	1	25
4.	Escape routes for subordinate animals		0	0	4	100
5.	Presence of stressful interactions		3	75	1	25
6.	Availability of 3-D space for use by animals		4	100	0	0
7.	Animals are shut	Onto exhibit for 1 day	4	100	0	0
8.		For the night	4	100	0	0
9.		Sufficient shade	4	100	0	0
10.		On natural substrates	2	50	2	50
11.		Sufficient nesting boxes	2	50	2	50
12.		Bathing areas	1	25	3	75
13.		Adequate bedding	4	100	0	0
14.		Safe furnishings	4	100	0	0
15.	Sufficient space in the enclosures		4	100	0	0
16.	Satisfactory cleaning of enclosures		4	100	0	0
17.	Adequate maintenance of buildings and fences		1	25	3	75
18.	Effective to contain animals enclosed		4	100	0	0
19.	Enclosure safe for the animals		4	100	0	0
20.	Adequate drainage in the enclosures		1	25	3	75



Graph no. 20: Observations made during assessment of protection from fear and distress for exotic mammals.

C. Native Birds

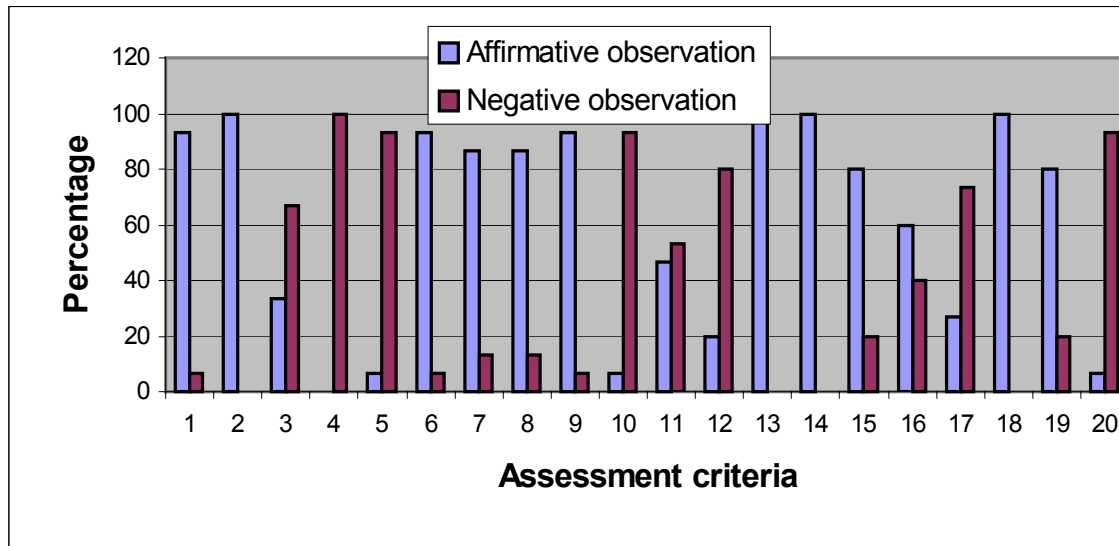
The architecture of aviaries and cages housing the birds effectively prevents contact between the birds and between the public and animals (Table No 21 and Graph No 21). However, in most of the enclosures, except for the nests there are no furnishings provided that the birds could use to retreat from public view. Stressful interactions between the housed birds have been noted. Most of the bird enclosures have sufficient space, safety and effective to contain the birds enclosed. However the cleaning and maintenance of the enclosures is not satisfactory.



Photograph 19: A display board on Ostrich

Table No. 21: Parameters for assessment of adequate provision of protection from fear and distress for native birds and the observations

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
1.	Effective prevention of contact between public and animals		14	93.33	1	6.67
2.	Effective visual screening between adjacently housed species		15	100	0	0.00
3.	Facility to retreat from public view		5	33.33	10	66.67
4.	Escape routes for subordinate animals		0	0.00	15	100
5.	Presence of stressful interactions		1	6.67	14	93.33
6.	Availability of 3-D space for use by animals		14	93.33	1	6.67
7.	Animals are shut	Onto exhibit for 1 day	13	86.67	2	13.33
8.		For the night	13	86.67	2	13.33
9.		Sufficient shade	14	93.33	1	6.67
10.		On natural substrates	1	6.67	14	93.33
11.		Sufficient nesting boxes	7	46.67	8	53.33
12.		Bathing areas	3	20	12	80
13.		Adequate bedding	15	100	0	0.00
14.		Safe furnishings	15	100	0	0.00
15.	Sufficient space in the enclosures		12	80	3	20
16.	Satisfactory cleaning of enclosures		9	60	6	40
17.	Adequate maintenance of buildings and fences		4	26.67	11	73.33
18.	Effective to contain animals enclosed		15	100	0	0.00
19.	Enclosure safe for the animals		12	80	3	20
20.	Adequate drainage in the enclosures		1	6.67	14	93.33



Graph no. 21: Observations made during assessment of protection from fear and distress for native birds.

D. Exotic Birds

The provisions for exotic birds are more or less similar to native enclosed birds except for ostrich that enjoys better conditions. The following table and graph no 22 shows different observations regarding provisions of protection from fear and distress for exotic birds.



Photograph 20: An ostrich in its appealing enclosure

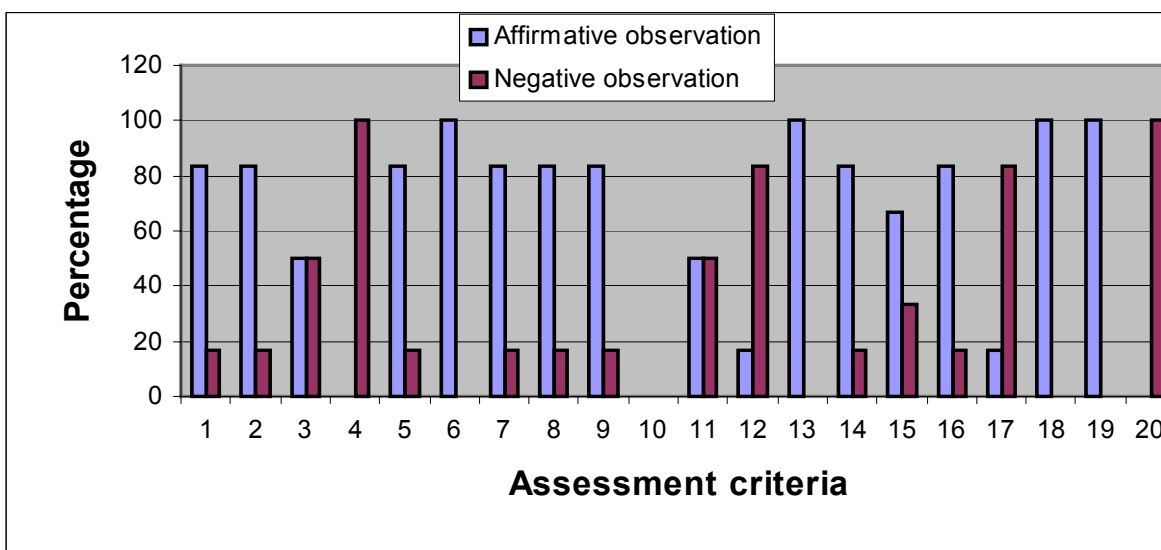


Photograph 21. A pair of pelicans

Table No. 22. Parameters for assessment of adequate provision of protection from fear and distress for exotic birds & the observations

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
1.	Effective prevention of contact between public and animals		5	83.33	1	16.67
2.	Effective visual screening between adjacently housed species		5	83.33	1	16.67
3.	Facility to retreat from public view		3	50.00	3	50.00
4.	Escape routes for subordinate animals		0	0.00	6	100
5.	Presence of stressful interactions		5	83.33	1	16.67
6.	Availability of 3-D space for use by animals		6	100	0	0.00
7.	Animals	Onto exhibit for 1 day	5	83.33	1	16.67
8.		For the night	5	83.33	1	16.67
9.		Sufficient shade	5	83.33	1	16.67
10.		On natural substrates	2		4	

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
11.	are shut	Sufficient nesting boxes	3	50.00	3	50.00
12.		Bathing areas	1	16.67	5	83.33
13.		Adequate bedding	6	100	0	0.00
14.		Safe furnishings	5	83.33	1	16.67
15.	Sufficient space in the enclosures		4	66.67	2	33.33
16.	Satisfactory cleaning of enclosures		5	83.33	1	16.67
17.	Adequate maintenance of buildings and fences		1	16.67	5	83.33
18.	Effective to contain animals enclosed		6	100	0	0.00
19.	Enclosure safe for the animals		6	100	0	0.00
20.	Adequate drainage in the enclosures		0	0.00	6	100



Graph no. 22: Observations made during assessment of protection from fear and distress for exotic birds.

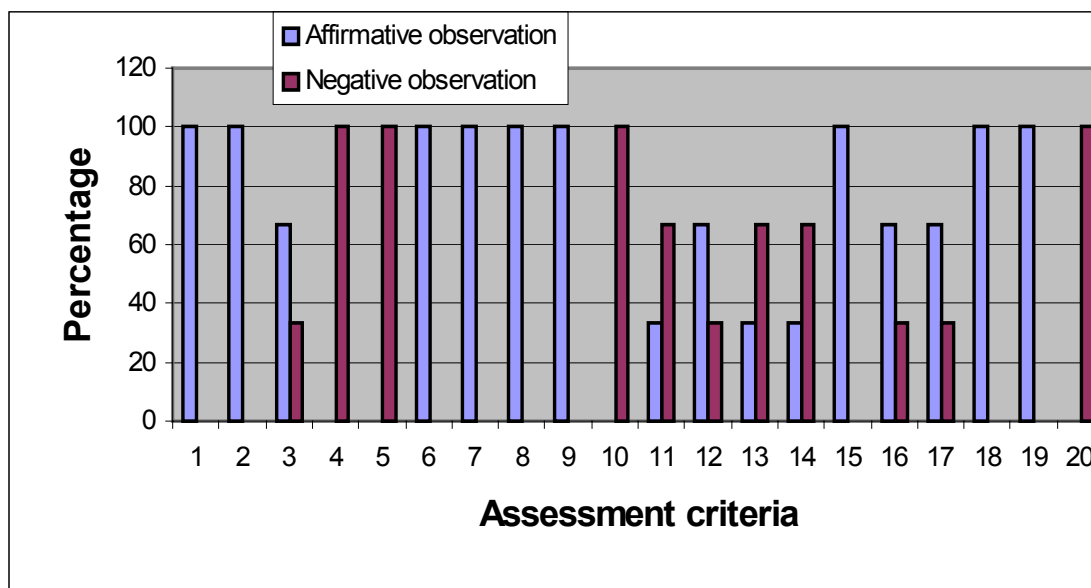
E. Native Reptiles

The reptiles especially the python and other snakes have been kept in highly safe enclosures with adequate attention given to public safety. All the enclosures prevent contact between the animals and with the public. Most of the animals have facility to retreat from public view. Sufficient provisions are made

to cater to behavioural needs of the reptiles to ensure minimal stress (see Table No 23, assessment criteria 6 through 14). Enclosures are effective in containing the animals, are safe but the cleanliness and maintenance of the enclosures are not satisfactory.

Table No. 23: Parameters for assessment of adequate provision of protection from fear and distress for native reptiles and the observations

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
1.	Effective prevention of contact between public and animals		3	100.00	0	0.00
2.	Effective visual screening between adjacently housed species		3	100.00	0	0.00
3.	Facility to retreat from public view		2	66.67	1	33.33
4.	Escape routes for subordinate animals		0	0.00	3	100
5.	Presence of stressful interactions		0	0.00	3	100.00
6.	Availability of 3-D space for use by animals		3	100.00	0	0.00
7.	Animals are shut	Onto exhibit for the day	3	100.00	0	0.00
8.		For the night	3	100.00	0	0.00
9.		Sufficient shade	3	100.00	0	0.00
10.		On natural substrates	0	0.00	3	100.00
11.		Sufficient nesting boxes	1	33.33	2	66.67
12.		Bathing areas	2	66.67	1	33.33
13.		Adequate bedding	1	33.33	2	66.67
14.		Safe furnishings	1	33.33	2	66.67
15.	Sufficient space in the enclosures		3	100.00	0	0.00
16.	Satisfactory cleaning of enclosures		2	66.67	1	33.33
17.	Adequate maintenance of buildings and fences		2	66.67	1	33.33
18.	Effective to contain animals enclosed		3	100.00	0	0.00
19.	Enclosure safe for the animals		3	100.00	0	0.00
20.	Adequate drainage in the enclosures		0	0.00	3	100.00



Graph no. 23: Observations made during assessment of protection from fear and distress for native reptiles.

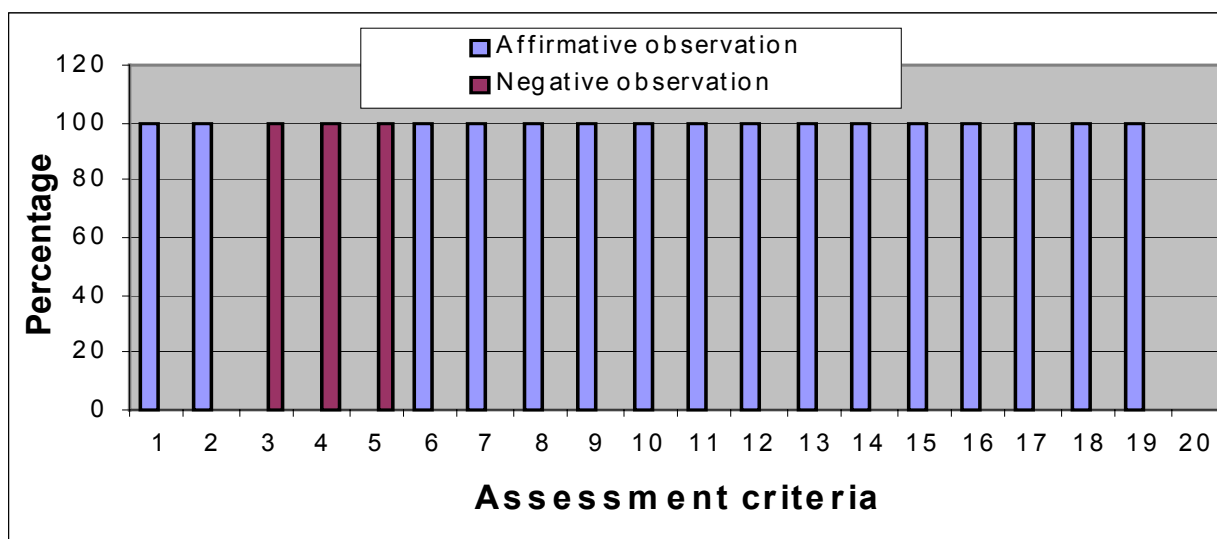
F. Aquarium

The provision of protection from fear and distress for fishes is more or less satisfactory as shown in the following table no 24 and graph no. 24

Table No. 24: Parameters for assessment of adequate provision of protection from fear and distress for fishes in the aquarium and the observations

S. N.	Assessment criteria		Affirmative observation	%	Negative observation	%
1.	Effective prevention of contact between public and animals		1	100	0	0.00
2.	Effective visual screening between adjacently housed species		1	100	0	0.00
3.	Facility to retreat from public view		0	0.00	1	100
4.	Escape routes for subordinate animals		0	0.00	1	100
5.	Presence of stressful interactions		0	0.00	1	100
6.	Availability of 3-D space for use by animals		1	100	0	0.00
7.	Animals are shut	Onto exhibit for 1 day	1	100	0	0.00
8.		For the night	1	100	0	0.00
9.		Sufficient shade	1	100	0	0.00

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
10.	On natural substrates Sufficient nesting boxes Bathing areas Adequate bedding Safe furnishings	1	100	0	0.00
11.		1	100	0	0.00
12.		1	100	0	0.00
13.		1	100	0	0.00
14.		1	100	0	0.00
15.	Sufficient space in the enclosures	1	100	0	0.00
16.	Satisfactory cleaning of enclosures	1	100	0	0.00
17.	Adequate maintenance of buildings and fences	1	100	0	0.00
18.	Effective to contain animals enclosed	1	100	0	0.00
19.	Enclosure safe for the animals	1	100	0	0.00
20.	Adequate drainage in the enclosures	-		-	



Graph no. 24: Observations made during assessment of protection from fear and distress for native mammals.

4.2.5 Provision of Health care

Table No 25 to 30 and Graph No.25 to 30 below presents the conditions of the animals of the central zoo with regard to provision of food and water.

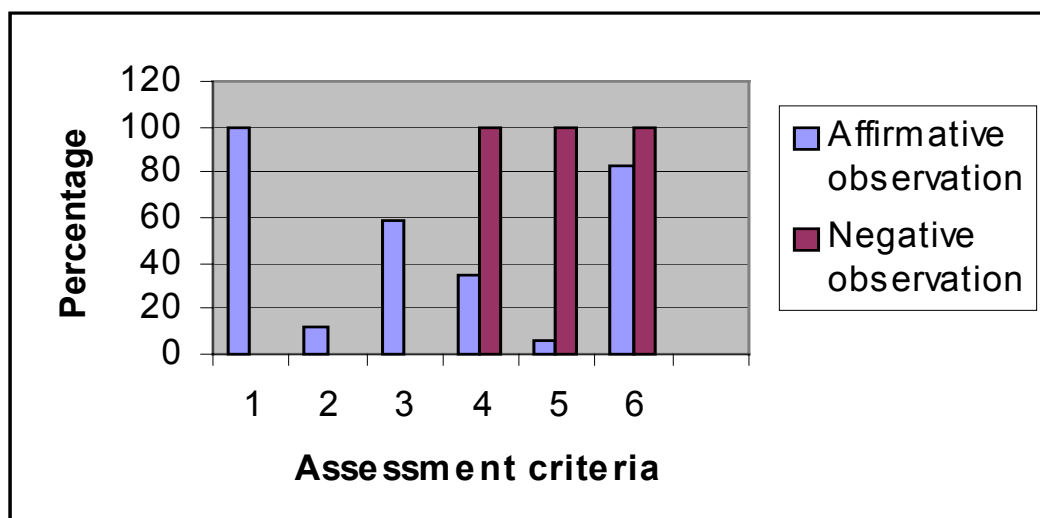
A. Native Mammals

The table no 25 and graph 25 present the provision of health care for native mammals. The veterinary clinic at the central zoo takes care of the sick animals and is equipped with basic facilities. A regular observation is done to trace out

sick animals and treat them accordingly. However, some long-standing diseases have been encountered in those native mammals where it was difficult to dart and handle the animals (11.76 %). Due to relative variation in size of the housed mammals, isolation quarters are not available for all sick native mammals. Some of the males are segregated under captive breeding programmes to prevent overproduction due to management constraints.

Table No. 25: Parameters for assessment of adequate provision of health care for native mammals and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Regular observations on animal conditions and health	17	100		0.00
2.	Presence of old, unattended or disease problems	2	11.76	15	88.24
3.	Presence of reserve accommodation for isolation of sick animals for treatment	10	58.82	7	41.18
4.	Captive breeding to control overproduction	6	35.29	11	64.71
5.	Signs of ineffective pest control	1	5.88	16	94.12
6.	Enclosures prevent social interaction problems.	14	82.35	3	17.65



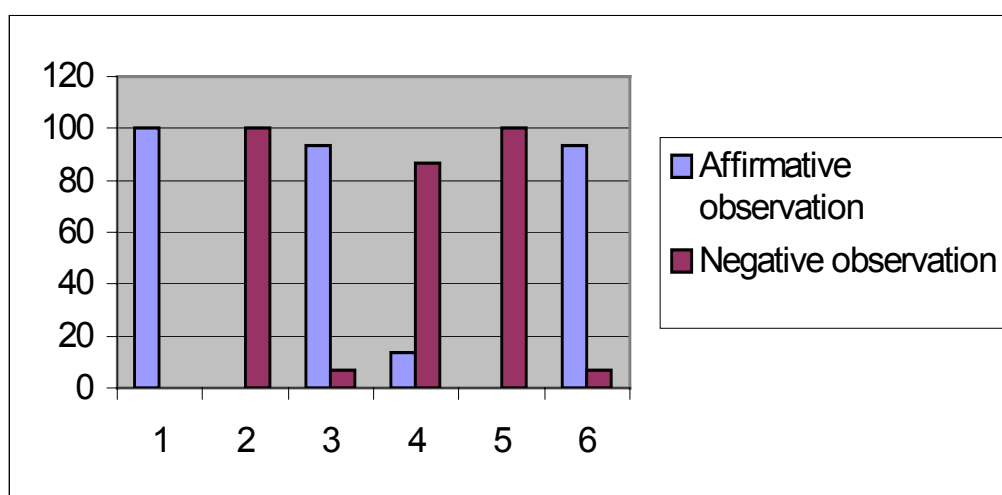
Graph no. 25: Observations made during assessment of adequate provision of health care for native mammals.

- **Exotic Mammals**

For exotic animals too a regular health check up is carried out. No unattended disease problems could be found. Isolation quarters exist for treating most of exotic mammals. Like the native mammals, the males are segregated to prevent overproduction. The arrangements in enclosures for pest control and prevention of acts of aggression are more or less good (table 26 and graph 26).

Table No. 26: Parameters for assessment of adequate provision of health care for exotic mammals and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Regular observations on animal conditions and health	4	100	0	0
2.	Presence of old, unattended or disease problems	0	0	4	100
3.	Presence of reserve accommodation for isolation of sick animals for treatment	3	75	1	25
4.	Captive breeding to control overproduction	2	50	2	50
5.	Signs of ineffective pest control	0	0	4	100
6.	Enclosures prevent social interaction problems.	3	75	1	25



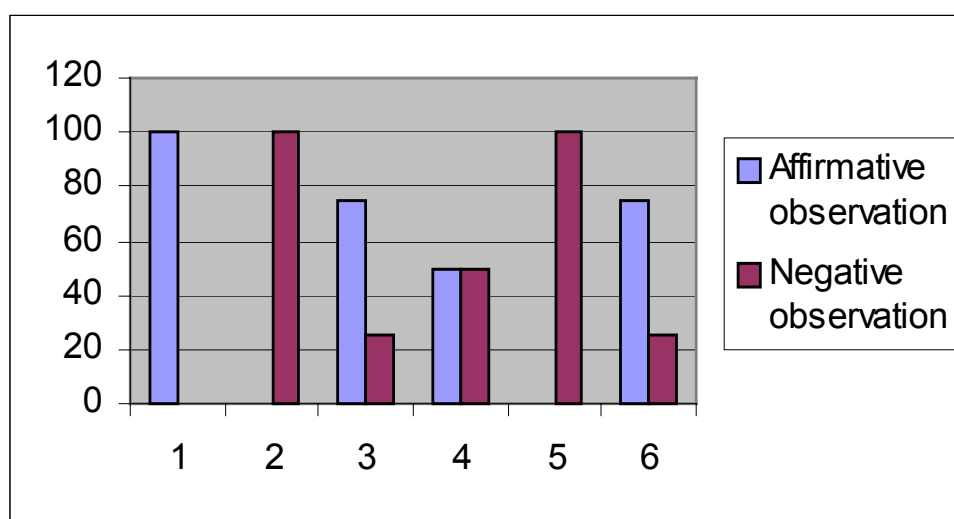
Graph no. 26: Observations made during assessment of adequate provision of health care for exotic mammals.

- **Native Birds**

According to table 27 and graph 27, health problems encountered in the birds are well attended and there is no long standing disease problems present in the bird population. Segregation quarters for sick birds exist and are well taken care of. Overproduction is not a major problem for the bird population however males of some species are subject to segregation (table 27). Enclosure designs cause minimal stressful interaction between the birds and prevent physical injuries.

Table No. 27: Parameters for assessment of adequate provision of health care for native birds and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Regular observations on animal conditions and health	15	100	0	0.00
2.	Presence of old, unattended or disease problems	0	0.00	15	100
3.	Presence of reserve accommodation for isolation of sick animals for treatment	14	93.33	1	6.67
4.	Captive breeding to control overproduction	2	13.33	13	86.67
5.	Signs of ineffective pest control	0	0.00	15	100
6.	Enclosures prevent social interaction problems.	14	93.33	1	6.67



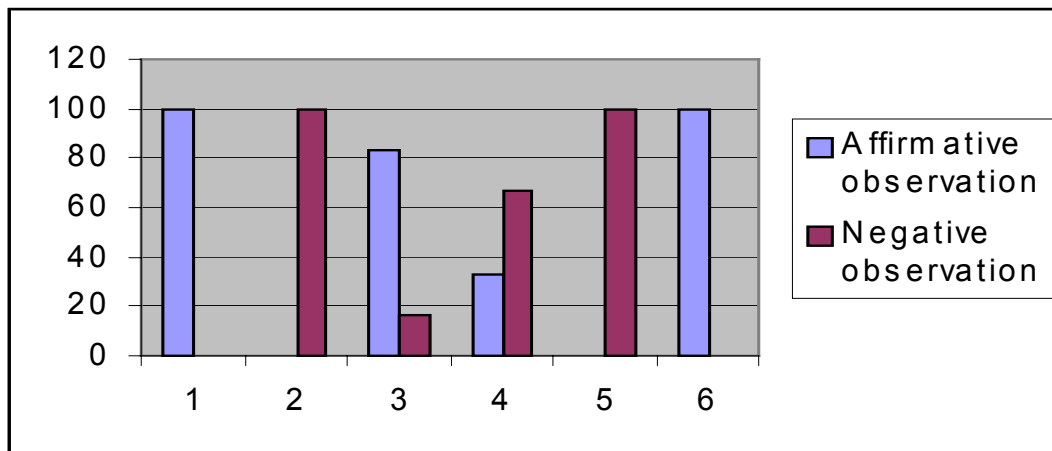
Graph no. 27: Observations made during assessment of adequate provision of health care for native birds.

D. Exotic Birds

The provision of health care for exotic birds is shown in table no 28 and graph 28. A good provision exists for all exotic birds with available clinic facilities.

Table No. 28: Parameters for assessment of adequate provision of health care for exotic birds and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Regular observations on animal conditions and health	6	100	0	0.00
2.	Presence of old, unattended or disease problems	0	0.00	6	100
3.	Presence of reserve accommodation for isolation of sick animals for treatment	5	83.33	1	16.67
4.	Captive breeding to control overproduction	2	33.33	4	66.67
5.	Signs of ineffective pest control	0	0.00	6	100.00
6.	Enclosures prevent social interaction problems.	6	100.00	0	0.00



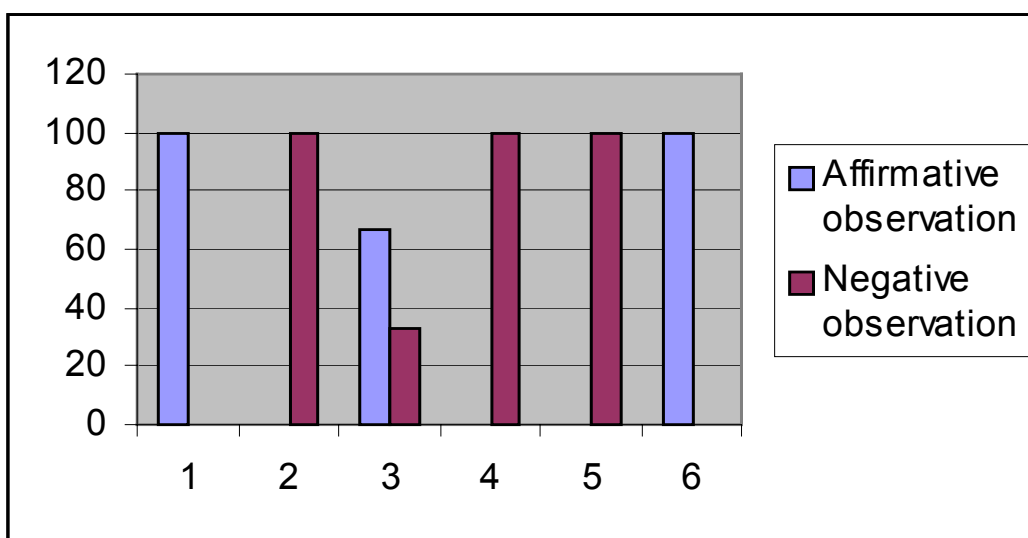
Graph no. 28: Observations made during assessment of adequate provision of health care for exotic birds.

E. Native Reptiles

Like all the animals a regular observation on animals' conditions and health is made. There are no long-standing disease cases. Due to enclosure design, the pest invasion and stressful interaction between the reptiles is absent. Table 29 and graph no 29 present the observations in case of reptiles.

Table No. 29: Parameters for assessment of adequate provision of health care for native reptiles and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Regular observations on animal conditions and health	3	100.00	0	0.00
2.	Presence of old, unattended or disease problems	0	0.00	3	100.00
3.	Presence of reserve accommodation for isolation of sick animals for treatment	2	66.67	1	33.33
4.	Captive breeding to control overproduction	0	0.00	3	100.00
5.	Signs of ineffective pest control	0	0.00	3	100.00
6.	Enclosures prevent social interaction problems.	3	100.00	0	0.00



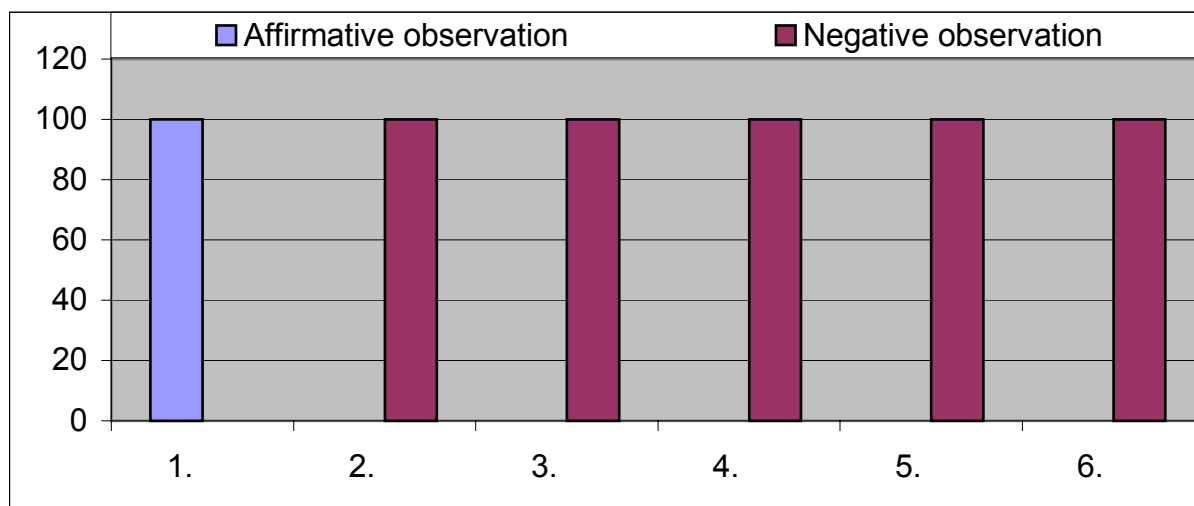
Graph no. 29: Observations made during assessment of adequate provision of health care for native reptiles.

F. Aquarium

There are provisions to provide health care facilities to the fishes in the aquarium though there are several limitations as shown in the Table number 30 and Graph 30.

Table No. 30: Parameters for assessment of adequate provision of health care for fishes in the aquarium and the observations

S. N.	Assessment criteria	Affirmative observation	%	Negative observation	%
1.	Regular observations on animal conditions and health	1	100	0	0.00
2.	Presence of old, unattended or disease problems	0	0.00	1	100
3.	Presence of reserve accommodation for isolation of sick animals for treatment	0	0.00	1	100
4.	Captive breeding to control overproduction	0	0.00	1	100
5.	Signs of ineffective pest control	0	0.00	1	100
6.	Enclosures prevent social interaction problems.	0	0.00	1	100



Graph no. 30: Observations made during assessment of adequate provision of health care for fishes in the aquarium.

5. Future Plans

Zoo is a place to display animals for conservation education, research and entertainment. In our context it also has specific social and cultural role. Central zoo is marching a head for self-sustainability, to meet this requirement central zoo has following future plans:

- Collection of valuable animals especially native endangered species and some of exotic species to attract people.
- Provide better enclosure and better enrichment
- Scientific and systematic care of captive animals.
- Research and Breeding of valuable animals.
- Extension of education activities.
- Extension of visitor facility and recreation.
- Maintenance of visitor flow over one million annually.

In the long-term strategy, the central zoo intends to prepare a master plan for the future growth and development. A masterplan has already for consideration, the financial capacity of the proposed masterplan is estimated to be of 5.95 million U. S. \$. It includes the cost of civil sanitary, electrical, interior furnishing and landscaping works.

❖ **Central Zoo's Proposed master plan:
Design Concept and Consideration:**

Mainly two things have been taken into consideration for making the concept.

1. Physical space constraint - optimize space use.
2. Pound in the focal point of design - because of its prominence and historical significance.

The design concept is as follows,

1. Arrangement of Display based on
 - Ecological
 - Habitat
 - Behavioral theme.
2. Incorporation of Social, Cultural and Religious value to the exhibits and the environment.
3. Better utilization of the Pond.
4. Uncluttered and Attractive Entrance Area.

5. Possibility of Night Safari
6. Educational area tailored to social needs.
7. Accessibility for Handicapped visitors
8. Economy
9. Environment friendly design.

6. Problems and Constraints

Due to a lack of proper planning, the central-zoo has witnessed uncoordinated growth over the past few years. The housing conditions for the animals are far from satisfactory. The main problems faced by the central zoo are:

- Lack of space (land) around to expand. There is only one possibility of expansion its southeast side up to the main road.
- Lack of sufficient fund: From July 16, 2001 central zoo has to depend mostly on its own earning the earning around 20 million rupees is sufficient for day to day expenses. The funds provided is inadequate and repair work.
- Lack of trained man power
- Problem of having to keep extra animals:
Presently there are 10 Barking Deer, 28 Spotted Deer and 89 Black Bucks, similarly some other species are also more in numbers than actually needed for exhibit or breeding. The present management is not in a position to translocate or sell these animals, which is a huge burden for central zoo economically and also using more space.
- General problems also include lack of quarter for veterinary staff, back up power and proper drainage facility.

7. Conclusion

Due to lack of proper planning the central zoo has witnessed uncoordinated growth over the past. The housing conditions for the animals are far from satisfactory. The central zoo is situated in mid of Kathmandu valley without any possibility of extending its area.

After the take over of central zoo by King Mahendra Trust for Natural Conservation some progress is visible inspite of problem and constraints,

1. New attraction of exotic animals and birds have been added, like Siamong (Ban Manchhe), Hippopotamus (Jal Gainda), Kakatuwa, Lorikeet, Ostrich, different varieties of pheasants, and some native specimen.
2. Aquarium in added with nearly 21 species of exotic fishes
3. Beautification of area.
4. Area for entertainment and education has been added.
5. Economical self sustainability has been achieved.
6. Central zoo master plan has been prepared.
7. Fund raising program under King Mahendra Trust for Nature Conservation in conducted in countries like United Kingdom, Germany and Canada.
8. Central zoo is an active member of South Asian Zoo Association for Regional Cooperation (SAZARC) and has organized an inaugural conference on May 2000 in Kathmandu, and is committed to maintain at least Minimum Standard of Animal Display and Welfare in their collection

8. Recommendation:

King Mahendra Trust for Natural Conservation (KMTNC) is determined to improve the condition of central zoo. Visible progress made by central zoo within a short period of time in appreciated by public. Central zoo has pledged to follow the code of Ethics Formulated by south Asian Zoo Association for Regional Cooperation (SAZARC) for its development.

1. The central zoo Master plan submitted by Shah Consult International (Pvt.) ltd. must be taken in to consideration to implement phase wise as in the proposed master plan.
2. Collection of indigenous wild animals and birds has to be initiated
3. Initiation has to be done for removing or finding a place for the relocation of excess number of large animals i. e. Breaking Deer, Spotted Deer, Black Buck etc.

4. Quarantine facility has to be developed and regulation of strict quarantine procedure is started.
5. Sick animal management facility has to be provided.
6. Wild life management is strengthened.
7. Liaison with international zoos and wildlife support organization has to be made to support in financial, technical, human resource development and in animal exchange program.

And it is strongly recommend establishing another zoo preferably within Kathmandu Valley or in the vicinity to accommodate more animals in their natural environment.

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ANNEXE

CHECKSHEET FOR ASSESSING HUSBANDRY AND HOUSING FOR KATHMANDU ZOO ANIMALS AND BIRDS JULY 2002.

Name of Facility Central Zoo		Date		
Species being assessed				
Enclosure Type (e.g. Naturalistic, grotto, nocturnal, barred cage)				
Assessment of Five Freedoms for all Species of Animals and Birds Kept in Jawalakhel Zoo. <p style="text-align: right;">~ Note N/A defined as not applicable or not assessed.</p>				
Provision of Food and Water	Yes	No	N/A	Notes
1. Is a species specific diet supplied?				
2. Is drinking water available?				
3. Is natural feeding behaviour catered for?				
4. Are multiple feeding stations provided for group living species?				
5. Are feeding methods safe?				
6. Are supplies of food and water: Stored hygienically ? Prepared hygienically ? Presented to animal hygienically ?				
7. Is diet provided multiple times daily ?				
8. Is feeding by visitors permitted and properly controlled?				
Provision of Suitable Environment	Yes	No	N/A	Notes
1. Are temperature, ventilation, lighting and noise levels appropriate?				
2. Is outside access provided ?				

3. Enclosure furnishings: sufficient shelter ?				
Provision of Opportunity to Express Normal Behaviour	Yes	No	N/A	Notes
1. Does accommodation adequately cater to meet the biological and behavioural needs of the animals ?				
2. Is the environment complex ?				
3. Is species housed in an appropriate social group ?				
4. Are active efforts made to enrich environment ?				
5. Is appropriate cage furniture provided, e.g. ropes, perching, platforms, etc. ?				
6. Is cage furniture being renewed ?				
7. Are there signs of stereotypic or self-directed behaviours ?				
Provision of Protection from Fear and Distress	Yes	No	N/A	Notes
1. Do enclosure barriers: effectively prevent contact between public and animals, where necessary ? Provide visual screening between (a public and animals or b) adjacently housed species ?				
2. Can animals retreat from public view ?				
3. Are there escape routes/circular flow for subordinate animals ?				
4. Are inter-species and/or intra-species interactions such that they are not excessively stressful ?				
5. Is three-dimensional space available for use by animals, where appropriate ?				
6. Are animals shut: onto exhibit for the day ? in for the night ?				

sufficient shade ?				
natural substrates ?				
sufficient nesting boxes, where appropriate ?				
bathing areas, where appropriate ?				
bedding provided ?				
safe furnishings ?				
4. Does enclosure provide sufficient space ?				
5. Is the cleaning of the area satisfactory ?				
6. Is the standard of maintenance of buildings and fences adequate ?				
7. Are enclosure barriers: effective in containing animals ? safe for animals ?				
8. Is adequate drainage provided ?				
Provision of Health Care	Yes	No	N/A	Notes
1. Are observations of animal condition and health made and recorded ?				
2. Are there signs of old, unattended injuries or disease problems ?				
3. Are enclosures designed so that social interaction problem may be avoided ?				
4. Is adequate reserve accommodation available for isolation of animals for assessment/treatment/recovery ?				
5. Is captive breeding controlled to prevent overproduction ?				
6. Are there signs of ineffective pest control ?				

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