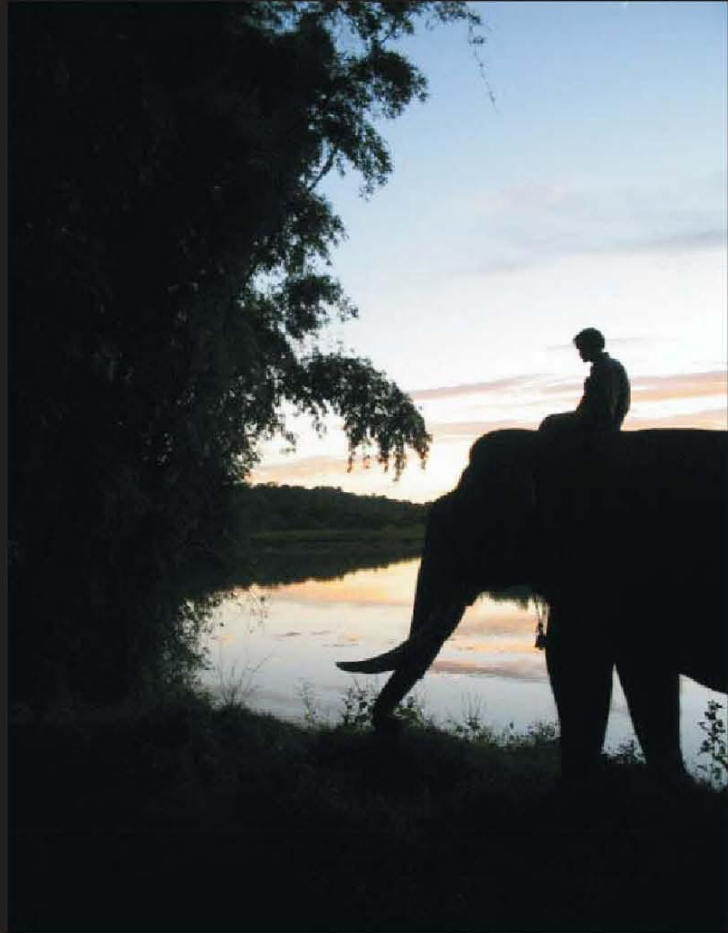


Welfare and Management of Elephants in Captivity



Proceedings of a Workshop on Welfare Parameters and their Significance for Captive Elephants and their Mahouts in India

Editors: Surendra Varma and Deepika Prasad



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PREFACE

The Workshop on Welfare Parameters and their Significance for Captive Elephants and their Mahouts in India was organised in May 2008 at Bangalore under the auspices of the Project Elephant Directorate, Ministry of Environment and Forests (MoEF), New Delhi. The workshop was the outcome of an all-India survey conducted by Compassion Unlimited Plus Action (CUPA), Bangalore, in technical collaboration with the Asian Nature Conservation Foundation (ANCF), Bangalore, sponsored by World Society for Protection of Animals (WSPA), U.K.

The survey was initiated in 2005. The broad objective of the survey was to study the management and welfare conditions of captive elephants and their mahouts in various management regimes in India. The study revealed the necessity to formally elaborate on the parameters that are critical to the welfare and healthy physical and psychological life of elephants in captivity. Initially, parameters and their properties were identified and ratings for each parameter and its property were assigned. Later, the entire process was critically reviewed by experts through this workshop. To formalise the above, parameters had been identified and the document on the concept developed by ANCF/CUPA research teams was formally reviewed and modified in a listing of priorities. This was agreed upon by a consensus of the people who had been invited for their knowledge and experience in the field of elephant ecology, healthcare, mahout/cawadi/owner and management of elephants in captivity.

In this workshop, a specific technical session was conducted by dividing the participants into four working groups. Each group was given a broad topic out of the 114 parameters listed in a document exclusively developed for it. All four groups deliberated on parameters ranging from the origins of the elephants to the size, space, exercise, area of sleep, rest area, interaction, work, food, crop raiding patterns, healthcare, veterinary records, management issues and record keeping. Apart from the working group's collective inputs on the topic specific to them, a separate document containing all the parameters listed and their definition was distributed to experts for their individual inputs, consensus and acceptance or rejection of the projected parameters. Ratings that were initially used were also under critical review; a document with a list of parameters was distributed to the experts who were asked to rate each parameter on a 1–10 scale. The objective of this exercise was to incorporate expert opinion on individual parameters and arrive at a mean rating for each parameter as against only of 0–10. With the mean value of each parameter, the properties of parameters could be rated further.

On the second day, the four working groups' documents were deliberated on and the suggestions provided were recorded. Inputs or suggestions were translated into a draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India. The document has been referred to as a draft concept as it may provide an opportunity for other experts to give their critical inputs. This is an evolving process and the new ratings identified by the experts will be incorporated to develop a final document on the subject. The final document will also have refinement in the concepts, and new ratings as against only 0–10. The exercise of introducing the significance of welfare parameters, subsequent review process, formal presentations on specific topics by experts, informal discussions at the tea break, lunch/dinner tables, and workshop sessions gave an opportunity to develop the proceedings.

The proceedings of the workshop are divided into three sections. Under welfare parameters, Section 1 has three chapters such as identifying and defining welfare parameters, draft concept note on welfare parameters and insights and recommendations identified based on formal and informal discussions at various levels. Section 2 has 14 chapters and deals with sharing of experiences of studying and managing captive elephants and their mahouts across India. The first two chapters describe the vision for captive elephant management and care centers. The concept of care centers evolved from Kerala is presented here, as it is assumed that by solving Kerala's captive elephant management problems a major portion of the captive elephant environment can be improved.

The next three chapters describe the state-wise status of captive elephants; the following two chapters speak about the historical and cultural perspective as well as the management dilemma of keeping captive elephants. These two chapters are followed by a description of government initiatives. The abstracts are placed towards the end of this section and they start with a vision of an NGO (actively involved in captive elephant management), followed by the state-wise captive elephant status. Section 3 provides a unique observation of a volunteer, who came as an observer and presented her experience of attending the workshop through informal notes.

The workshop has been an invaluable source of diverse and relevant information and enriches the knowledge of elephant keeping. The proceedings have now been finalised as a knowledge document on the subject, and is presented here under its current thematic title. We hope that it will be a source of ready information and reference on the welfare and other parameters essential for keeping elephants in a captive environment.

ACKNOWLEDGEMENTS

The CUPA-ANCF team meeting with the Ministry officials in May 2008 led to the presentation on the status of captive elephants in India and subsequently to the suggestion that welfare parameters need to be urgently identified for positive changes to take place. The initiative and interest of the Secretary of Ministry of Environment and Forests (MoEF), Meena Gupta, and her team of officers from the Ministry on the subject of captive elephants was the trigger that led to the All-India Workshop on Welfare Parameters for Elephants in Captivity.

Our (Project Elephant-PE/Compassion Unlimited Plus Action-CUPA/Asian Nature Conservation Foundation-ANCF) foremost thanks are to Meena Gupta, the ex-Secretary of MoEF, without whose support the entire exercise may not have been possible. Raman Sukumar (Professor at the Indian Institute of Science - IISc), with his knowledge of wild elephants, helped and guided us to put captive elephant situations in perspective. The Principal Chief Conservator of Forests (Wildlife) Assam, M.C. Malakar and the Principal Chief Conservator of Forests (Wildlife), Karnataka, I.B. Srivastava helped to throw light on the dilemmas faced by officials in the handling of captive elephants in their States. Thomas Mathew, Executive Director, ANCF, provided institutional support.

K.C. Panicker (retired Professor, College of Veterinary and Animal Sciences, Kerala Agricultural University), made the supreme effort of driving down from Kerala, in spite of poor health, to participate and give us the benefit of his vast experience and knowledge. Kushal Sarma from Assam gave us a true insight into the captive elephant situation in North East India. The presentation by Ajay A. Desai (Co-Chair IUCN/SSC Asian Elephant Specialist Group) helped to put in perspective the contradictions inherent in the situation which need corrections before challenges can be addressed to upgrade the lives of captive elephants. A.J.T. Johnsingh (Wildlife expert) gave expert guidance on the parameters and the possibilities of change.

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Savitha Nagabhushan, Managing Committee Member, CUPA and Santosh, Assistant, CUPA for helping to make the workshop a success and for the completion of the parameters on welfare. Mr. Jeroen (Wildlife Management Student from Amsterdam), and Roger Mann (Elephant Nature Foundation, U.K.) are deeply appreciated for their interest and support in various ways during the study.

The investigation on the status and welfare of captive elephants and their mahouts was possible through formal and informal support provided by many experts and institutions. Support included travel grant provided to one of the research team members by the WWF- AREAS to attend the Zoo Keepers meeting in Australia. Constructive support through interactive meetings with many keepers and experts motivated us to develop a concept note for the identified welfare parameters. Special thanks are also due to Fred Kurt, member, IUCN/SSC Asian Elephant Specialist Group, Amrithraj C. Williams, Coordinator, Asian Rhino and Elephant Action Strategy (AREAS) WWF-International, Ellen S. Dierenfeld, Manager, Sustainable Program Research Novus International, Inc., USA, John M. Ray, Deputy Director, Twycross Zoo, UK, Scott Wilson, North of England Zoological Society, UK, Barbara Gerard, Director, Grande Gesture, Ltd., USA, Avanti Mallapur, Animal Behaviour and Welfare Group, School of Veterinary Studies, University of Edinburgh, UK, Steve Martin Natural Encounters Inc., USA, Hank Hammatt, Elephant Care International, USA, Alan Roocroft, Elephant Business, USA, Jody Watkins, Elephant Manager, Virginia Zoo, USA, Paul Howse, Steering Committee Member, International Conference of Zoo Keepers (ICZ), USA, for their inputs and other support.

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Section 1: Welfare Parameters and their Significance

Identifying and defining welfare parameters for captive elephants and their mahouts in India

Surendra Varma¹

Abstract

India supports a large population of captive elephants. However, detailed investigations of the status of captive elephants and their management are not available. A study focusing on the ecology and management of the Asian elephant was initiated in 2005 that aimed at identifying and defining welfare parameters for the Asian elephant in captivity in India. A total of 1200 elephants were sampled using a specifically developed datasheet and then reviewed by national and international experts. The data collected has been used in creating elephant profiles, individual identification, body measurements, body condition, information on injury occurrence (also through photographs), assessing population status, and identification of a number of parameters and their welfare significance for both elephants and their handlers.

The data obtained helped in identifying specific data-processing protocols. The total number of parameters available for data-processing across a management regime ranged from 50 to 83. These parameters were rated on a scale of 0–10 with zero representing bad welfare conditions and ten representing satisfactory welfare conditions. The patterns of mean ratings of elephants for different management regimes ranged from 2.4 for the category of travel–begging elephants to 7.9 for forest camp elephants. Assessing the welfare status by investigating the percentage occurrence of zero or ten for different management regimes, it was observed that ten values dominated for forest camps followed by zoos, private ownership, temples, circuses and travel–begging. The investigation also provided insights into the influence of extreme values in identification of welfare status. The results indicate that as the percentage of ten scores increases, mean-ratings also increases. In addition, the study reveals the possibility of significant difference in the data collected by different observers and greater availability of data influencing the welfare status of the animal. The data also has very specific scope for developing welfare definitions for welfare parameters.

Introduction

India supports a large population of captive elephants (Bist et al., 2001; Sukumar et al., 1997; Kurt et al., 2004). Historically, elephants were used for warfare, however, currently they are being used to patrol protected forest areas, for cultural, religious and commercial purposes, and as zoo exhibits (Bist et al., 2001). At present, they are kept in forest department's elephant camps, in temples, in state zoological gardens, and in circuses. They are also owned by private individuals. With a few exceptions, inadequate space, facilities, funding, manpower, water, food, and a combination of the lack of trained mahouts and suitable employment have adversely influenced the quality of management, psychological condition (Kurt, 2005) and life of the captive elephant (Kurt et al., 2004; Mallapur, 2005). The status of captive elephants and their management has not been investigated in detail and it is important that these aspects are studied to suggest improved systems of husbandry. A study on care and management was initiated in 2005 to focus on identifying and defining welfare parameters for the Asian elephant in captivity in India. Each parameter thus identified and defined could then be used to determine the overall welfare of the captive animal based on divergence in these parameters from those in the wild.

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Our investigation

The data collection for the study was based on two workshops that were conducted for developing a methodology to assess the status of elephants and to identify welfare parameters for the species in captivity. Overall, 22 national and international experts of the species provided their inputs during this exercise. Based on this, a 25-page 'passport' (covering 32 parameters) was developed for each elephant. The 'passport' covered 813 questions (can also be referred to as variables and sub-variables) with an average number of 23 (SE = 4.46, N=32, CV % = 19, ranging from 1 to 100) variables/parameters (Table 1). These parameters reflect the diverse aspects of elephants' condition in captivity and their overall welfare status.

Type of data obtained and data-processing protocols

A total of 1200 elephants were sampled. Data was collected by observation of the elephants and interview of available personnel in each location. Quality and quantity of data available varied for each individual elephant and/or management regime. The number of parameters or variables that were studied varied from animal to animal depending on age, sex and other criteria such as free ranging status, origin, diet, reproductive status, and other factors. The data for each elephant was also influenced by a variety of factors such as availability of elephant, manager, veterinary doctor, owner, mahout, their interests towards data contribution, and other aspects. The data covers 279–512 variables and many factors cause variations in it, factors or combination of factors influence the variation in data available or what could be obtained is presented in Table-1 (see A, B, C of Table-1). This data is usable to build elephant profiles, for body measurements, photographic details for identification, to evolve body condition index, injury occurrence, status of pigmentation and other aspects. Although a total of 32 parameters were identified for data collection, the number of parameters that were used for assessing the significance of the welfare were 25 (the parameters that were used are highlighted in Table-1). Such parameters include a number of variables/sub-parameters which can vary depending on the situation. Here parameters refer to characteristics of a particular aspect of a captive situation that is made of several components/sub-parameters. For instance, 'water' is a parameter made of sub-parameters such as: availability of perennial source of running water, distance to water source, quantity of water provided for drinking, etc. Each parameter and their sub-parameters may have different properties, for example, source of water could be river or lake or water tank or tap, etc. and the distance to the nearest water source may vary from 0 to several kilometres.

Table 1. Variables/sub-variables considered for captive elephants and their handlers

Sl no.	Parameters	Number of variables/sub-variables	Factors or combinations of factors		
			A	B	C
1	Profile	15	15	15	15
2	Animal details and Measurement	20	20	20	0
3	Photograph and details	6	6	6	0
4	Origin (source) of Elephant*	22	8	6	0
5	Purpose of keeping*	1	1	1	1
6	Elephant stay in given state	1	1	1	1
7	Mahout (keeper) change	5	5	5	0
8	Enclosure*	39	19	39	39
9	Water*	21	21	21	21
10	Major activities*	8	8	8	8

11	Rest*	8	8	8	8
12	Sleep*	10	10	10	10
13	Walk*	9	9	7	7
14	Exercise*	5	0	0	0
15	Interaction*	11	11	0	0
16	Training*	14	14	0	0
17	Free ranging and chaining*	18	18	6	6
18	Behaviour and personality*	26	5	8	26
19	Work*	57	2	4	5
20	Food*	45	45	9	5
21	Reproduction*	99	0	0	0
22	Disease/disorder*	11	0	11	11
23	Body condition, including				
	Pigmentation/injury	28	28	28	28
24	Medical problem*	100	9	18	27
25	Veterinary care*	20	20	1	1
26	Facilities*	28	28	0	0
27	Manpower*	24	24	1	1
28	Fund*	18	18	1	0
29	Observation	1	1	1	1
30	Mahout/ Cawadi*	96	96	96	96
31	Owner*	52	52	5	5
32	Registration*	10	10	5	5
Number of variables		813	512	293	279
Mean		23.9	14.6	8.4	8.0
CV %		18.64	17.3	23.0	26.1

* Parameters used for assessing the significance of welfare.

A = Captive born, free ranging, young animal (no reproduction), no abnormal behaviour including stereotype, no work, no disease, only one medical problem, with veterinary doctor and assistant.

B = Capture, kept under manmade system, no walk, no exercise, no interaction, no training, no killing, but stereotype, work involves performing only 'pooja', no reproduction, only one medical problem, no doctor, no veterinary assistance, no facilities, no manpower.

C = No animal details, no photo, purchased, no detail of mahout change, no walk, no exercise, no interaction, work in festivals, no reproduction, no details of fund, no cawadi.

The data revealed maintenance of elephants under different management types. The elephants were grouped based on ownership. Among owners, further classification was done based on the predominant feature of captivity: use for work. Hence, we have the classes of forest camps, zoos, temples, circuses (private ownership where elephants perform for the public), private (where elephants are not primarily maintained for work) and Travel-Begging elephants (private owners who use their elephants in travelling and begging).

Assessment of welfare through ratings

Apart from a detailed investigation of the welfare aspects through identification of parameters of welfare significance, each of the parameters was rated on a scale of 0–10 as a measure of the welfare status of the elephant under study. Ten represented satisfactory condition and zero bad condition for the animal for that parameter (Varma et al., 2008). The suitability of a parameter depended on the replication of near natural conditions for the animal. Any feature which provided conditions experienced by the animal in the wild was given a rating of ten. The greater the deviation from the natural condition or environment, the lower was the rating accorded (Table 2).

Table 2: Welfare classification of the ratings

Sl No	Score	Quality of Score
1	10 to 7.5	Satisfactory
2	7.4 to 5	Moderate
3	4.9 to 2.5	Poor
4	2.4 to 0	Bad

For instance, if the elephant is exposed to natural running water (since running water has less contamination), the parameter for ‘water quality’ was given a score of 10. If the source of water is not natural (such as a water-trough) and the water is prone to contamination, a score of 0 is given. The provision of hard surfaces such as stone or concrete floors gets a score of 0 as compared to the availability of natural substrates like an earthen floor. Low score for hard surface is meant to reflect the ill-effects of such substrates on the health of the animal, specifically the feet of an animal as large as an elephant.

Patterns of ratings

In order to evaluate the welfare conditions effectively, each of the parameters was considered individually, independent of the influence of other factors. For example, if the parameter ‘interaction’ is considered, it may evaluate whether or not an elephant has the opportunity to interact with other elephants. If an elephant is not in a free range setting, but is allowed to interact with another elephant, then the ‘interaction’ parameter gets a rating of 10, even though it is unable to roam freely and choose its partner. However, if an elephant is in a free-range system but does not have the opportunity to interact with other elephants, then the ‘interaction’ parameter will get a rating of 0.

Anything that is sacrificed from a semi-natural condition receives 50% of the score. For example, if a semi-natural condition gets a score of 10, a housing situation inferior to a semi-natural condition, such as a thatched roof, will receive a rating of 5. Consequently, anything worse than a thatched roof, such as a house made of concrete/asbestos, will receive a score 2.5.

Some parameters were rated based on a ‘Yes-No’ type of information. In such situations the ratings were either 10 or 0 without any scores in between. The rating for each parameter (e.g., sleep) was averaged across its sub-parameters (e.g., duration of sleep, place of sleep, etc) to give a mean value for that feature. Welfare status of the mahout/cawadi (handler/assistant to mahout) was rated by studying his socio-economic profile and experience in handling elephants. The rating scale used was the same as that for the elephants. High ratings imply suitable social and economic conditions and/or experience prevailing for the mahout/cawadi.

Patterns of ratings for different captive elephant managements in India

Welfare assessment of elephants

Among the elephants surveyed, examples of data available for different management regimes are presented below:

- Six types of institution/management types were studied—circus, forest camps, private owners, temples, travel–begging elephants and zoos.
- Number of parameters available for the data processing ranged from 12 to 15. The total number of sub-parameters studied ranged from 50 to 83 (Figure 1).

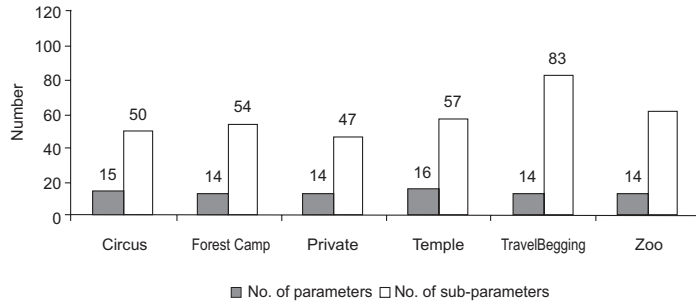


Figure 1: Number of parameters and sub-parameters studied for different management regimes.

The pattern of ratings across different management regimes varied considerably. Mean ratings for elephants (Figure 2) ranged from 2.4 (SE = 0.1, N=830) to 7.9 (SE = 0.1, N=665). When these ratings were arranged from minimum to maximum, the rating for the category of travel-begging elephants appeared to be the lowest, followed by circus, temple, private, zoo and forest camps. These results suggest a need for improvement in welfare status to the extent of 80% for travel-begging elephants, and only 20% for forest camp elephants.

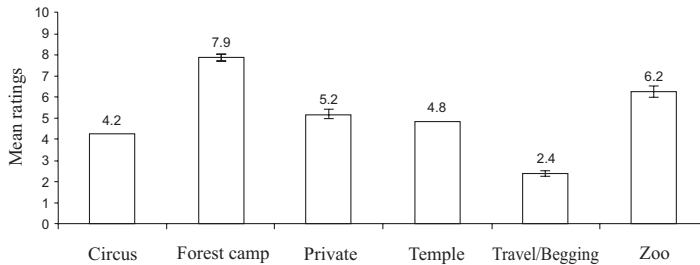


Figure 2: Mean ratings arrived for different management regimes in India.

Among the institutions studied, moderate welfare conditions (Mean rating of 5.2, SE = 0.2, N=375) appear to exist for the category of private elephants. This situation may not be true if the category of private ownership is assessed individually or even collectively. The moderate status of the result is due to the sampled animals being kept close to the forest and they enjoy free-ranging status and other values associated to it.

The same procedure of rating was used for assessing the welfare of elephants which were seized/confiscated (Figure 3). The following results could be seen for an elephant which was kept under temple management regime and later was shifted to a forest camp following the government order (Varma, 2007). When this elephant was in the custody of its pre-seizure owner (temple), mean rating was 3.9 (SE = 0.4, N=107). Following seizure and shift to a forest camp, mean rating was 8.3 (SE = 0.3, N=107), indicating a 40% improvement in its welfare status. If the animal were to continue in the temple, efforts would have had to be made to bring about 60% improvement in its welfare status.

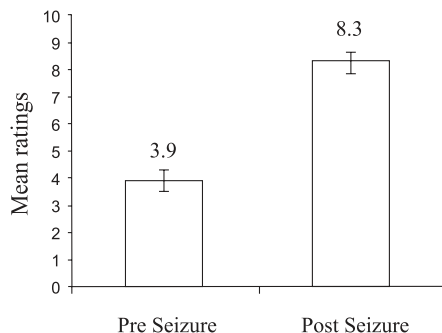


Figure 3: Mean welfare rating for a confiscated elephant during pre- and post-seizure period.

Welfare assessment of mahout

There appears to be no difference in the welfare status of handlers (Figure 4) among forest camps, private and zoo handlers studied. Mahouts of travel–begging (rating was 2.8, SE = 0.89, N=130) circuses (rating was 4.34, SE = 0.0, N=113) and temple (rating was 4.78, SE = 0.0, N=987) management regimes are in poor welfare status. Findings from this study suggest welfare status for both elephant and mahout occur in the class of Bad to Poor conditions in these management regimes.

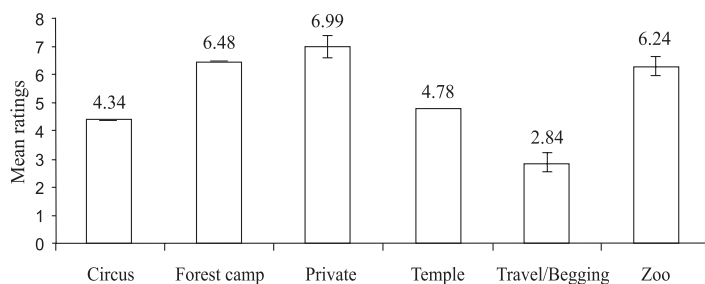


Figure 4: Mean rating for mahouts from different management regimes.

Ratings and gradation

Elephants from different management regimes were subjected to an investigation to identify their welfare status by providing ratings ranging from 0 (bad) to 10 (satisfactory) for the existing conditions (Figure 5). Ten values dominated for forest camps (68%), followed by Zoos (57%), Private (52%), Temple (39%), Circus (35%) and Travel-Begging (8%).

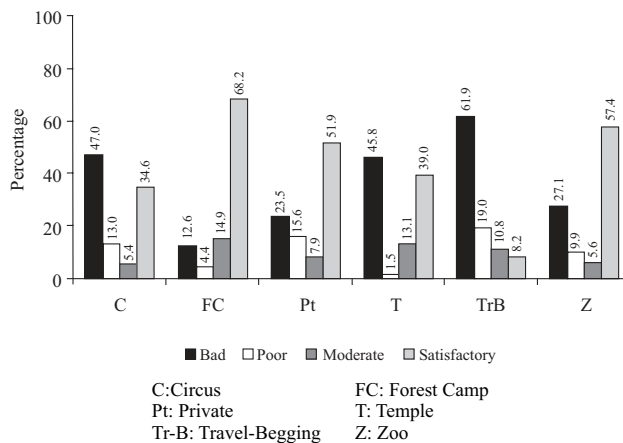


Figure 5: Overall welfare status of elephants from different management regimes.

For the seized/confiscated animal, there was a dramatic shift in the ratings, with an observed trend towards domination of ten values, post-seizure (Figure 6).

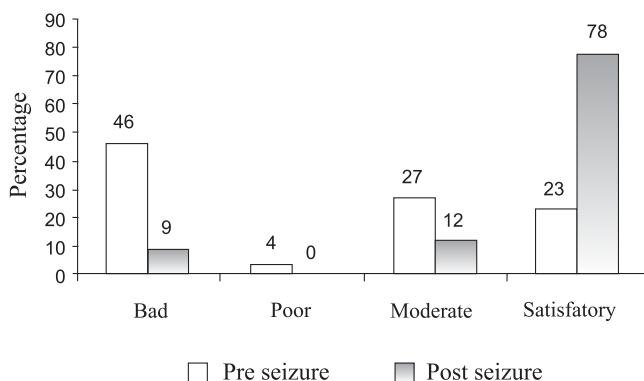


Figure 6: Overall welfare status of a confiscated elephant during pre- and post-seizures period.

Investigation on the influence of extreme scores and other aspects

It could be assumed that the rating of a given animal is influenced by a number of factors and a critical review may throw more insights into the concept of rating approaches for animal welfare. The selection of parameters and their ratings also gave scope for an investigation into the influence of extreme scores (0 or 10) on ratings, providing an insight into the relationship between percentages of ten-zero scores and mean ratings. There may be a lot of uncertainty in data collection (due to non-

cooperation/no interest/no records, etc.) and the data available or obtainable may be severely biased towards negative or positive side of welfare aspects.

The presence or absence of extreme values may have greater influence on the actual status of welfare, given the variation in data available and observer difference. The study and its findings also provide a scope for review of factors such as variation in data collection between observers, role of specific parameters on the mean rating, influence of elephant–mahout scores and their role in assessing welfare status of captive elephants in different management regimes.

Influence of extreme scores on ratings

A. Influence of ten or zero scores on overall rating

There could be two ways for a given animal getting 10 or 0 scores:

- a) Most of the data collected or available for a given animal may be of 10 or closer to 10 scores or 0 and vice versa.
- b) The data set may have more of ‘Yes or No’ types; Yes (10) or No (0) type may dominate in this.

From data obtained for elephants in temples, it was found that on an average 36% (S.E. = 1.1, N=25, % C.V = 3.0) scored 10 (of this, 22% formed Yes (10) from the Yes–No type of data), and on an average 37% of 0 scores contribute to the overall mean ratings and this percentage includes the zero values from ‘Yes–No’ data. These results suggest a balanced contribution of extreme values (10 and 0) to the ratings of the animal.

B. Correlation between percentage of 10 or 0 scores and mean ratings

A total of 25 elephants belonging to different temples were used for assessing the relationship between percentage of 10 or 0 scores and the mean ratings. For this purpose, mean ratings of welfare parameters for each elephant and percentage of 10 scores were calculated. The Shapiro–Wilk’s W test suggests that the distribution of both percentage of 10 scores and mean rating was not normal ($p < 0.001$) and the non-parametric correlation showed a significant relation between these two ($r = 0.813$, $p = 0.000$, Fig.7). The result indicates that as the percentage of 10 scores increases, the mean ratings also increase.

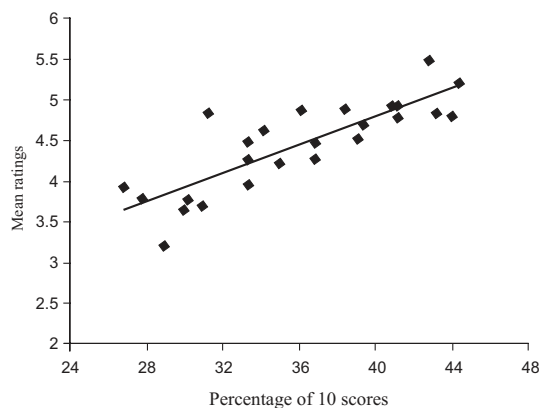


Figure 7: Relationship between percentage of 10 scores and mean ratings.

From this result it could be suggested that if the ratings are biased towards 10 or closer to 10 (due to inadequate samples of data for scoring), this may project biased results of the status of welfare. In temple elephant data used, both 10 (or closer to 10) values and 0 values contribute equally, and despite the correlation of higher mean rating related to higher percentage of 10 values, overall mean rating is less than 5 (overall mean = 4.7); an indication of the poor conditions existing for the elephants in temples.

C. Variation in data collection between observers

It was also assumed that there could be a significant difference in the data collected by different observers and there was an opportunity to test this, as two different observers collected data for temple elephants. The comparison was possible as there was a similar sampling design (similar sample methods adopted) and number of animals sampled (52% of total animals were sampled by observer 1 and 48% by observer 2). A total of 54 parameters pertaining to elephants were considered for data processing. The data on mean number of parameters scored varied across observers and the results were significantly different ($U=148$, $z=-3.78$, $p=0.002$). The results show that greater availability of data gives a clearer picture of the status of the animal. Increase in data showed a reduced mean rating for the elephants in temples (Table 3). The overall mean ratings for elephants across the two observers showed significant difference ($U=9$, $z=3.73$, $p=0.0002$).

Table 3: Mean % of parameters scored, mean % of 10 and 0 values across different observers

	Mean % of parameters scored (SE)	Mean % of 10 values (SE)	Mean % of 0 values (SE)	Mean ratings (SE)
Observer 1	59.6 (3.5)	39 (1.0)	33.1 (1.8)	5.2 (0.1)
Observer 2	74.5 (1.5)	32.7 (1.9)	41.5 (1.8)	4.3 (0.1)

In this study, as greater proportion of information was available to be used for rating, percentage of 0 scores increased, percentage of 10 scores decreased and both trends were statistically significant ($U=22.5$, $z=2.99$, $p=0.003$ for increase in the 10 values across the observers and $U=128.5$, $z=-2.72$, $p=0.007$ for decrease in the 0 values across observers).

Developing definitions

Apart from understanding the patterns of welfare status of elephants, the survey also provided a base for definition for each welfare parameter. For example, for one of the parameters, the source of elephant may have different properties (Table 4) and each property could have the following definitions.

If the elephant is born in captivity, it signifies that the mother may live in a suitable environment, and in good reproductive health. If the animal is purchased, received, transferred or of unknown source, it is subjected to a change in ownership, management, or place and is a victim of the lack of monitoring in the trade of elephants. If an adult elephant is captured from the wild, it contributes to the reduction of number in the wild, and is the most stressful adjustment for the animal and management (in terms of manpower, resources and expertise available).

Overall, if the welfare of elephants that are kept in captivity were to be assessed based on this parameter, the following properties of the parameters could be considered.

Table 4: Properties of the welfare parameter ‘Origin of Elephant’

1	Captive born
2	Orphaned/rescued
3	Purchased/received/transferred/unknown
4	Captured

Significance of the parameters and their definitions

- The parameters listed may act as base or benchmark for future data collection for assessing the welfare status of captive elephants.
- The definitions provided may enhance the knowledge of each parameter and identify the value of each parameter in the welfare of the species kept in captivity.
- Overall, the parameters listed and definition provided may also eventually lead to the formation of a policy related to the welfare of elephants kept in captivity.

Conclusions

The study is the first of its kind. With experts’ critical reviews, the study provided a systematic datasheet for collecting data on captive elephant status, management and welfare. The data obtained helped in identifying specific data processing protocols, review of the patterns of ratings for different management regimes, influence of extreme values and variation in data collection. It also provided a definition for different welfare parameters and their value to welfare of the animal.

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Draft concept note on welfare parameters and their significance for captive elephants and their mahouts in India

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* The order of names presented here is based on the order of presentations made by the experts during the workshop. For others, it is the sequence in which the reviewed document was received from them.

Introduction

Elephants are a highly social, intelligent and long-living species with a very complex system of communication (Poole and Moss, 2008). In the wild, they have a very structured social organisation, where females and their calves form the core unit of the family. Females remain in their group throughout their life while males depart on sexual maturity to lead a solitary life although staying loosely connected to family herds (Vidya and Sukumar, 2005). Elephants have been tamed and kept under captivity for more than 4000 years. However, the life of elephants in captivity is in stark contrast to the life of free-ranging ones. The social structure and associated behaviours are very difficult to replicate when elephants are placed in captivity. If commercial and cultural interests compel them to be kept in captive conditions, it is important that they are provided with the highest quality of care and management, more specifically the highest standards of housing, healthcare and welfare to live in captivity. The aim should be to surrogate the overall environment towards a natural, species-specific environment so as to reduce alien conditions normally experienced in captivity. However, there is no study or investigation or knowledge that provides insights into the compromise that captive elephants undergo when they are kept in captivity.

Captive elephants have been an integral part of India's history, culture and tradition for centuries (Bist, et. al., 2001). India has a strong tradition of the science of captive elephant management (Sadhale and Nene, 2004, Vidya and Sukumar, 2005). However, the current status of these animals and their management is not well known and is limited to a few features of captivity. Welfare of elephants in captivity may be reflected by two prime aspects. Primarily, it is important that a wide range of features of captive elephant management are investigated and analysed to suggest improved systems of husbandry. Secondly, to effectively evaluate the welfare conditions of the elephants, parameters that cover ecology, behaviour, social life, psychological well-being and physical health, need to be identified and their value for elephants has to be highlighted. As an example, space (shelter) in this context should be defined as an ecological space as opposed to structural space, which should take care of the day-to-day needs (food, inclusive of water and interaction) of a social species like the elephant with minimal constraints imposed.

The study on ecology and management of captive elephants (Varma et. al., 2008) provides a platform for developing specific datasheets for field investigation, assessing population, welfare and management status, and also identifying and defining welfare parameters. The study investigated 1200 elephants across different management regime in 12 different states of India. Apart from attempting to provide detailed information on the population and management status, a number of welfare parameters have been identified. This identification was primarily based on specific data available on a given parameter for a given animal. Based on this experience, this document primarily aims to identify and list welfare parameters/sub-parameters and their properties for captive elephants and their handlers in India. This document also tries to recognise the welfare value of each parameter/sub-parameter and its property through specific welfare definition or significance.

Here, a parameter could be considered as a distinct feature that identifies welfare of the elephant by being integral to its biology and natural history. For example, the parameter 'enclosure' is a conspicuous feature of captivity with its effect on welfare which is through the imposition of restriction or realisation of near-natural conditions as observed in the wild. Parameters are shaped by sub-parameters and their properties that describe varying levels of occurrence or diverse types of that feature. 'Enclosure' may have sub-parameters such as type, size, shade and other features associated to it. 'Properties' refer to the various components that provide value through its effect on

welfare to a parameter. For instance, the parameter 'shelter/enclosure' has properties such as occurrence of natural, forest conditions, or man-made structures using different materials, or an open space without any natural conditions. The property can be a 'Yes' or 'No' type. For example, in considering the availability of facilities, before assessing the status of the facilities provided to elephant keeping, it is important to know the existence of the facilities themselves. A 'Yes' denotes the positive aspect and a 'No' implicates the negative aspect of the facilities. As mentioned earlier, the properties of parameters/sub-parameters can have distinct identities. For example, the parameter of 'Oiling done' may be criteria of either being done regularly, irregularly or never. These different layers of properties of a parameter/sub-parameter could also be used to grade the particular parameter.

As we try to identify the compromise that any captive elephant undergoes when it is kept in captivity, it becomes important to identify the meaning of welfare. We believe that it is linked to the ecological or biological environment experienced by captive elephants in the context of differences between captive and wild environment. Following captivity, the deviations experienced during different stages of life by the animal may reflect on the status of its welfare. The significance of welfare parameters refers to the effect on survival, continued existence and psychological well-being of the animal in captivity. We consider the elephants in captivity to be animals brought from the natural environment. This denies their natural way of living to various degrees and for different reasons, one of which may be associated with the property of economic gain observed in such situations. Different definitions may be available in literature for captive elephants. However, our definitions are linked to our objectives of primarily identifying the importance of welfare parameters to a species that is denied its natural living process in an environment in which the species has evolved over many millennia.

Management in this context could be constituted as the conditions provided to the captive animal and the protocol followed. Imposition of management on an animal entails significant deviation from welfare parameters as it could be primarily oriented towards human interests and constraints. Handlers are persons appointed by the management or owners who interact with and control their animal to primarily take care of the animal complying with human interest and constraints. This could further influence the welfare parameters. As a person is directed to take care of an animal, his interests may not coincide with that of his animal or it could be in conflict with a management strategy followed in the event of bearing a genuine interest for the animal's welfare. Our interests focus on identification of welfare parameters in managing elephants in captivity and assessing the role of elephant handlers in providing overall welfare status of elephants in captivity. This is complementary to the information on population status and management protocol of captive elephants gathered by the study.

We argue that both the concept of parameter/sub-parameter and its properties have to be defined in terms of their role in identifying the welfare status of the animal. The parameter identified may act as a base/benchmark for future data collection. The definitions provided for the parameter and its properties may enhance knowledge and introduce measurement/quantification in maintaining captive elephants. Identification and definitions may also lead to formation of policies related to welfare of captive elephants. There was also scope to identify the relative importance of each parameter or its property which was achieved by adopting a specific rating or scoring convention based on the premise of occurrence of near-natural conditions for the elephants in captivity. The rating logic or convention was evolved and reviewed based on the experiences or knowledge of elephant scientists, welfare personnel, veterinarians, managers, owners and mahouts.

Overall, this report is aimed at identifying the welfare needs of elephants that are kept in captivity and also to document the compromises that are made when a species with such a complex social system and intelligence is kept in a man-made and unnatural environment. The elephant undergoes a captive situation in totality as an interconnected web of effects. We have looked at the captive situation in terms of independent parameters to the maximum extent possible. These features when considered together will have an interlinking effect on providing a measure of welfare for that animal. The deviation in providing the right environment for the animal can be identified by looking at parameters that are considered unsuitable for a captive elephant.

Parameters and their welfare significance

1) Origin (Source) of elephant

If the elephant is born in captivity, then it signifies that the mother is living in a suitable environment, and is in good reproductive health. If it is rescued or orphaned, then it has been given the opportunity to rehabilitate and survive. If it is purchased, received, transferred or of unknown origin, then we assume that it has been subjected to a change in ownership, management, or place and is a victim of the lack of monitoring in the trade of elephants. Finally, an adult elephant captured from the wild entails reduction of its numbers in the wild, reduced gene contribution in the wild, and forms a period of stressful adjustment for the animal as it is subjected to chaining and an alien environment. It is also a period of adjustment for the management (in terms of manpower, resources and the availability of expertise). Transfer across facilities/locations may have an adverse effect on welfare through short learning periods for calves/young animals, or through breakage of established bonds among adults by introduction of new individuals among an established herd (Clubb and Moss, 2002).

Based on these criteria, welfare aspects can be assessed using the following:

- 1 Captive born (within facility)
 - 2 Orphaned/rescued
 - 3 Purchased/received/transferred/unknown
 - 4 Captured (from wild)
-

2) Characteristics of previous owner

Analysing the state of the elephant's previous ownership can determine the elephant's past conditions and thus assist in understanding its individual needs.

The following are definitions that are necessary for understanding the rating of this parameter:

1. Semi-natural environment: An environment that replicates an elephant's natural environment in the wild, with a few minor changes that still allows it to display species-specific natural behaviour patterns. For example, elephants confined to enclosures of a large area within forest conditions.
2. Unnatural environment: An environment that is not conducive for meeting the needs of an elephant and does not replicate the natural or semi-natural environment.

After determining the elephant's environment type, the management conditions, facilities and expertise are then evaluated for sufficiency.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Animal transferred from unnatural environment to semi-natural environment with proper management conditions, facilities and expertise
 - B Animal moved from an unnatural location to a semi-natural environment with facilities but without expertise
 - C Animal moved from an unnatural environment to a semi-natural environment without facilities or expertise
 - D Animal moved from semi-natural to unnatural conditions
-

3) Purpose of keeping

Elephants in captivity should be raised in the best conditions and with the highest welfare standards in place. Harsh training and inhumane working conditions affect their welfare. These practices can easily be avoided by considering the biology of each animal and employing them in a suitable environment. For example, care centres can keep elephants in semi-natural conditions with or without any commercial connection. Elephants which are used for forest patrolling or as kunkis for human–elephant conflict mitigation are understandable and legitimate uses. However, they must still be kept in humane conditions where they are not used for patrolling for long periods of time nor subjugated to harsh training. Elephants are also used for ceremonial, cultural, religious and eco-tourism reasons (e.g., elephants used for joy rides) where the physical and biological environment for the animal has to be taken care of.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A In semi-natural state, and not working for commercial interest
 - B In semi-natural state for patrolling
 - C In semi-natural state for *kunki*
 - D As a status symbol in natural conditions
 - E For commercial use in natural conditions
 - F Unnatural and for commercial use
-

4) Number of mahouts changed

The number of times that a keeper (handler) has been changed for an elephant reflects either a conflict between the keeper and its elephant, or a conflict between the welfare of the elephant and its management. The behaviour of a mild-mannered elephant can change to unpredictable and aggressive due to a high turnover in handlers (Clubb and Mason, 2002). The development of a bond between the handler and the elephant (Namboothiripad, 1998) may have adverse effects on the animal/handler when broken due to change in mahouts. However, in some situations a mahout change is essential, especially if he begins to act and behave inappropriately and compromises the elephant's welfare. Two mahouts per elephant (1 Mahout and 1 helper-Cawadi) is advisable as even if one person is changed the elephant will have to get used to only one new person.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A No change- single mahout/2 changes in mahout
 - B 3
 - C 4
 - D 5
 - E >5
-

5) Duration in free-range environment

A free-range environment signifies that the animal is not chained to one place and is allowed to roam/walk and move about freely. Roaming can be with or without chains. However, it is important to note that an elephant should be allowed to roam for a fixed number of hours as there must be time allotted to subject the elephant to regular health checks, and also provide sufficient time to manage and train it for veterinary care.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|--------------------------|
| A | Free ranging (max.) 20 h |
| B | 18 h |
| C | 14–18 h |
| D | 10–14 h |
| E | 6–10 h |
| F | 2–6 h |
| G | 0 |
-

6) Enclosure/Shelter

The purpose of an enclosure is to provide shade to the animal. Any kind of restriction on an elephant's movement affects the welfare of the animal negatively. An enclosed space gets a lower value as it restricts its movement. However, an enclosure that protects the elephant from harsh weather conditions receives a higher rating than the one which does not. Scores for shelter type are also based on the duration of free ranging.

A few factors considered when evaluating the animal's housing conditions are:

1. Whether the animal lives in a free-range environment or is housed in an enclosed shelter.
2. Whether the housing protects the animal from excessive heat and rain and what materials are used to do so. A thatched roof is significantly better than asbestos/tin/plastic as it controls temperature better and does not store heat but a thatched roof may have a limited life. It has been found that using clay tiles covered with grass is the best (Mann, *pers. obs.*).

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|---|
| A | Free ranging—natural shade |
| B | Free ranging within a man-made enclosure made with: <ol style="list-style-type: none">i Thatch/clay tiles with grassii Concreteiii Tin/plastic sheet/asbestos |
| C | Shelter as a structurally enclosed space* |
| D | No natural conditions + no man-made structure |
-

*Structurally enclosed space: an open space with a boundary wall enclosing the animal(s) or the space provided by the chain length with which the animal(s) are tied.

7) Enclosure/Shelter size

In prime elephant habitat (Sukumar, 1989) wild elephant densities are estimated to be two elephants/km² (Varman et. al., 1995) and this may translate into 125 acres/animal. When in captivity, an elephant should be housed in an enclosure that provides at least 1% of the space that it would need in the wild, within which natural forest conditions

exist in the context of land availability and resource allocation in captive situations. Therefore, the proper housing size could be 1.25 acres (1 acre = 4047 m²). However, for more than one elephant, space is not divided but shared. Hence, the minimum area needed for the group size should also be considered. If only adult males are present, the shelter size should be much larger. Ideally, a shelter should function to guard against sun/rain whereas an enclosure should refer to the whole area.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|---|
| A | Free ranging in semi-natural conditions |
| B | 5000 m ² (=1.25*4047) |
| C | 3750 |
| D | 2500 |
| E | 1250 |
| F | Less |
-

8) Flooring

We recommend substrates such as earthen floor that surrogate an elephant's natural living conditions. Hard substrates result in foot problems (Benz, 2005). If for some reason earthen floors cannot be provided, then cement floors are practical if the animal is only restrained on it for short periods of time. For bulls in musth, wood in kraals is considered ideal.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|----------------------------|
| A | Completely earthen floor |
| B | Concrete/any hard material |
-

9) Shade availability

Captive elephants need to be provided with some sort of shade to reduce their exposure to the harsh sun (Kurt and Garai, 2007). It should also be noted that since elephants in the wild choose when to utilise shade, captive elephants should also have the right to decide as to when they need shade and should not be forced to unnecessarily stay indoors. It is recommended that elephants should be provided with both full and partial shade during the day. Here partial would imply that there is only enough shade for some of the elephants in the location.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|-----------------|
| A | No shade |
| B | Shade available |
-

10) Shade type

A variation of shade types (including both natural and artificial shade types) is considered ideal for a group of elephants to avoid monopoly of the shade area by one dominant animal. Shade type should be such that there should be free flow of air in and out of the shade area. Tin or asbestos does not allow hot air to move out and they radiate more heat even during cool hours. We strongly advise against the usage of asbestos because of its toxicity.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Free ranging (natural shade)
 - B Free ranging within any man-made enclosure
 - i. With thatch/clay tiles + grass
 - ii. Source of shade through concrete structures
 - iii. With tin/plastic sheet/asbestos
 - C Shade as a structurally enclosed space + no natural conditions
 - D No natural conditions and no man-made structures
-

11) Overall enclosure hygiene

A successful captive system must include an impeccable cleaning routine and the utmost quality in hygiene conditions, as bad maintenance can lead to fungal growth and can be a breeding place for pathogens. In addition, cleaning can also comprise options such as sweeping, washing and antiseptic use, a combination of sweeping and washing, only washing or only sweeping. This will need to be linked to usage, i.e. if shelters are only used overnight they only need to be cleaned in the morning.

Even in places with suitable, elephant-friendly substrates, the animal can still experience an unhygienic environment and health problems (BIAZA, 2006) if tied to one place for a very long time such that it is unable to move freely. Thus, the place of tying within the earthen floor enclosure needs to be changed often to ensure hygiene and cleanliness. A separate area should be available for dung disposal.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Cleaning daily
 - B Cleaned once in two days
 - C Cleaned once in three days
 - D Cleaned once in 4 days/once a week
 - E No cleaning
-

12) Water availability

Natural river water is the best source of drinking water as it provides a perennial flow of water that is relatively free from contamination, is not limited to one specific spot and can thus allow the elephant to roam and move freely throughout the camp. If available, ad lib supply of water can be given. Quality of water is very important, hence, there is a gradation from rivers to pools to buckets containing smaller, stagnant sources of water.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Availability of running water (river)
 - B Large lakes/reservoirs/water holes
 - C Smaller water bodies like tanks, ponds
 - D Tap water
 - E Buckets, pots, etc.
 - F No water
-

13) Distance to source of water

Water availability should be for the actual enclosure. A dedicated water supply (stream or tap or bore well) should be available. Situations where water needs to be carried from outside to within the camp should be avoided. The water source needs to be in close proximity to allow the animal to hydrate easily and freely, also clean itself.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 0–500 m
 - B 500–1000 m
 - C Above 1 km
 - D Above 2 km
-

14) Number of times of bathing/day

An elephant needs to be bathed often to allow for proper temperature control and for maintenance of a healthy skin condition. This can be done by providing suitable rubbing posts, wallows, and dust baths. The other method of skin care can be through the mahout bathing the animal, especially when the animal is maintained in an urban / unnatural environment. An added advantage of this practice is that it can be used as a command tool for reinforcing the bond between mahout and elephant. However, it is also important to note that an elephant's time to roam freely in its environment should not be sacrificed in order to increase the number of baths given/day. Bathing is essential irrespective of season and more importantly during summer, but that does not mean one can compromise bathing in other seasons.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Once, twice/natural cleansing using rubbing posts, etc./Scrub bath with coconut husk
 - B Once in two days
 - C Once in 3–6 days
 - D Once a week
 - E No bath
-

15) Bathing place

In addition to cleanliness by removal of dead cells or parasites, and cooling the body, the bathing place should allow for enrichment of social bonds and physical exercise. The bathing place should be large and deep enough for the elephant to lie over and be completely submerged (Olson, 2004). It is also important for the bathing place to be free from contamination. In case of standing water it should be ensured that the elephant is allowed to drink water before being taken for its bath and also ensure that dung is not present in the water.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Rivers/Flowing water
 - B Large lakes/reservoirs/water holes/artificial tank (30' x 30') with drain
 - C Tap water (running)/spray shower
 - D Smaller water bodies like tanks, ponds
 - E Buckets, pots, etc.
 - F No water
-

16) Bath duration

A bath of 2–3 h reflects an elephant living in a free-range system that provides the elephant with the maximum of 20 h of roaming time.

Based on these criteria, welfare aspects can be assessed using the following:

- A 2–3 h
 - B 1 h
 - C 30 min
 - D <30 min
-

17) Bathing materials

Hard material, on an average (plastic brush, stone) results in damage to the skin due to its abrasive action and is not appropriate for bathing. However, materials that help in cleaning wrinkles do not lead to discomfort.

Based on these criteria, welfare aspects can be assessed using the following:

- A Natural materials like Mundakai (*Pandanus* spp.)/coconut husk
 - B Hard material (plastic brush, stone)
 - C No material
-

18) Availability and duration of drinking water

Three different situations were considered when creating ratings for this parameter:

1. An animal lives in a free range environment (with a maximum of 20 h for roaming/day) and can thus drink water as it pleases.
2. The elephant has no access to free range.
3. The elephant's environment is partly free-range and partly an enclosure. When free ranging, the animal can drink water whenever it wants.

Free ranging is considered here as animals that are subjected to varying periods of restriction on their movement with the consequence of altered ability to use water when they need to.

- 1) Animal with free ranging status (assuming 20 h/day)

Based on these criteria, welfare aspects can be assessed using the following:

- A Free ranging (in natural forest conditions) (max. 20 h) with free access to water
 - B 18 h
 - C 14–18 h
 - D 10–14 h
 - E 6–10 h
 - F 2–6 h
 - G 0
-

- 2) Not free-ranging (adult animal needs 250–300 l of water/day)

Observations on wild elephants have shown a consumption of more than 200 l of water per day (Sukumar, 1991). When an elephant has access to water, it consumes approximately five trunkfuls at a time. Each trunkful is assumed to be about 5 l of water. However, an individual elephant may drink varying amounts of water depending upon its

requirement, so the mahout should be observing and recording the number of trunkfuls the elephant takes each time it is provided with water.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A > 6 times (5 trunkfuls/time = 25 l)
 - B 5 times
 - C 4
 - D 3
 - E 1
 - F 0
-

3) Partly free ranging + partly no free ranging

An Elephant with restricted free ranging duration may access desirable quantity of water within its shelter.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A (i) Semi-natural, exposed to source of running water
(ii) Semi-natural, exposed to artificial source of water buckets or containers
 - B (i) Kept in unnatural conditions, given about 100 l/day
(ii) Kept in unnatural conditions, given < 100 l/day
-

19) Conditions of sleeping area

Elephants in the wild are known to modify their surroundings and substrates to enable comfortable sleeping positions (Kurt and Garai, 2007). Restrictions imposed on their movement and unsuitable enclosures may compromise their sleeping pattern. If the elephant is made to sleep within man-made enclosures, then a thatched roof is considered better than a concrete roof which is in turn considered better than tin, plastic or asbestos roofing. If the elephant is kept without being allowed to move freely, then it cannot lie down. Hobbles during sleep time must be avoided.

The size of the sleeping area should enable the elephant to exercise its option to choose its sleeping place and position. It is useful to note whether the elephant is able to lie down on its own or not. If stressed, it probably will not lie down to sleep, unless forced.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Sleep (natural conditions)
 - B Man-made enclosure
 - i. Man-made enclosure with thatch/clay tiles + grass
 - ii. Man-made enclosure with concrete roof
 - iii. Man-made enclosure with tin/asbestos/plastic roof
 - C Single leg (hind) chained—10-m long chain
 - D Hind and fore leg chained—10-m long chain
 - E Two more legs chained with short chain or hobbled
 - F Tied in a manner where it cannot lie down
-

20) Duration of sleep (night)

Elephants need a minimum of 4 h of sleep every day as they are known to be active for around 18–20 h (Sivaganesan and Johnsingh, 1995). Calves and younger elephants need longer durations of sleep.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 4 h
 - B <4
 - C <3
 - D <2
 - E <1
 - F 0
-

21) Walking

The parameter measures whether or not the elephant is allowed to walk freely. Absence of physical exercise (walking) on a variety of substrates may lead to foot injuries and diseases. Walking keeps the muscles and joints in healthy condition, prevents obesity and improves circulation. Hatt and Claus (2006) cite reports of obesity being linked to foot and joint problems. Benz (2005) cites the importance of exercise which otherwise leads to overgrowth of the soles of the feet and causes other foot problems. If the animal is being transported from one place to another on foot then it should be made to walk only 10 km per day on flat undulating terrain and no more than 5 km on hilly terrain. Such walks should not exceed 1 h at a stretch.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Natural/free range
 - B Limited walk
 - C No walk
-

22) Time of walk

Ideally, elephants should be walked at the coolest hours of the day, i.e. at dawn and in the evening. Since they have sparse sweat glands, elephants are greatly heat sensitive. They are sub-ungulates, being digitigrade on the front foot and semi-plantigrade on the hind-foot, implying that the soles of the feet are in constant touch with the substrate. Feet are well-cushioned to bear weight which is also borne by the pad of the foot. The pad is said to be softer to touch than the adjacent sole horn (Benz, 2005). Hard and excess heat may tear the soft pad of its foot.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Early morning + evening hours + natural terrain
 - B Early morning + early evening, but hard surface
 - C Late morning + early evening + hard surface
-

23) Interaction

This parameter determines whether the elephant has access to interact with other elephants or not. An elephant's social and family kinship ties are complex and long-lasting (Poole and Moss, 2008). Social interaction with other elephants is an integral part of the animal's well-being in captivity.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

In the wild, the average herd consists of 6–10 elephants (Sukumar, 2000), with the following proportions of age sex class:

- 2 Adult females
- 1 Sub-adult female
- 1 Juvenile male
- 1 Juvenile female
- 1 Calf

Therefore, an ideal captive environment must achieve a similar structure. Using this rationale, the ideal herd structure in captivity can follow variations of the following pattern:

- 39% Adult females
- 5% Adult males*
- 13% Sub-adult females
- 7% Sub-adult males
- 20% Juvenile females
- 2% Juvenile males
- 13% Calves

*The presence of sub-adult or adult males may be optional. However, this does not imply that males should be isolated or housed individually.

24) Type of Interaction

In the wild the average group size is around 6–10 (Sukumar, 2000). Ideally, there should only be 1–2 males with the remainder being females, sub-adults, juveniles and calves. The next best option is a group with females and sub-adults (in the absence of adult males). And finally, if this is also not possible, then an all adult female group is better than an all adult male group. Provision for interaction should also facilitate the animal to choose when, how and with whom it interacts.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Anything that replicates natural group size, allowing for creating animals' own group structures
 - B Free-ranging conditions within a group, interaction allowed of ideal group size
 - C No free-ranging but ideal interaction conditions
 - D Adult females with few sub-adults
 - E All females group interaction
 - F Single
 - G All adult male group
 - H No free-ranging and no interaction
-

25) Interaction distance

This parameter is defined in terms of whether an elephant is able to not only interact with another elephant, but also in terms of the distance between them considering that physical and olfactory communication can be restricted by distance among the animals.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Free ranging
 - B Chained, but within reach of each other
 - C Chained beyond the reach
-

26) Interaction (in hours)

This parameter rates the amount of time an elephant is able to interact with another. It is not just interaction, but the duration and quality of interaction are also important; if interaction is unconditional, it gives opportunity for an individual to interact whether it wants to or not. The distance between individuals play a critical role in the duration and quality of interaction (Poole and Moss, 2008; Vidya and Sukumar, 2005).

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 24 h
 - B 18–24
 - C 12–18
 - D 6–12
 - E 1–6
 - F 0
-

27) Chaining

Chaining an elephant is not natural as it restricts its movement and leads to health problems causing wounds as well as increase in stereotypic behaviour (Kurt and Garai, 2007).

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

28) Region of chaining

A lot of care should be taken while chaining an elephant as the procedure of putting on chains itself can result in a wide variety of foot and skin related problems which are slow in healing when being regularly chained (Kurt and Garai, 2007). Hence, the use of chains on more than one region of the body might have a greater effect than chaining in a particular region.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Two legs/leg and neck/all body
 - B One leg with short chain
 - C One leg with long chain
 - D One leg alternatively with long chain
-

29) Chaining during free ranging (drag chain/body chain/leg chain/hobbled)

The duration that the animal is chained should be checked. It can be classified based on the time it is chained and the number of hours it is chained per day. If an animal is allowed to range free without chains, it is considered better than those that are allowed to range free within a confined environment. However, it should be noted that chaining captive elephants is a situation that cannot be avoided in the proximity of wild herds.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|-----|
| A | Yes |
| B | No |
-

30) Behaviour

Behaviour is subjective and is hard to interpret. However, one of the causes for unruly behaviour of an elephant could be poor management (Kurt and Garai, 2007). Also, elephant management could be predicted, to a certain extent, by behaviour as pliable animals or those that are not aggressive may have been conditioned to do so. This may be confounded by the basic temperament of the animal which could be aggressive or quiet.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|----------------------------|
| A | Quiet/docile/calm |
| B | Predictable |
| C | Undependable/unpredictable |
| D | Aggressive |
-

31) Injured/killed a human

Elephants that have injured or killed a human in the past can be a cause of concern for the mahout and public safety. Instances of aggression have been attributed to musth (even a well-managed bull can kill during musth), and poor welfare measures and work conditions (Clubb and Mason, 2002). This parameter should be considered carefully as some injuries can also be accidental.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|-----|
| A | Yes |
| B | No |
-

32) Stereotypy

The expression of stereotypy has been linked to the absence of features in an environment which assist in the culmination of appetitive behaviour (Wiedenmayer, 1997). Stressors, both physical and psychological, that elephants are subject to in captivity may lead to aberrant behaviour (Bradshaw, in press). An elephant may express stereotypic behaviour such as weaving/chewing/grooming/excessive pacing when it suffers from extreme stress (loneliness, boredom, lack of activity, constant harsh handling) and trauma.

Based on these criteria, welfare aspects can be assessed using the following:

-
- | | |
|---|-----|
| A | Yes |
| B | No |
-

33) Intensity of stereotypy

This parameter has been classified considering the intensity of occurrence based on the frequency with which the behaviour is expressed within a period of time. The greater the intensity exhibited, the greater is the stressful situation.

Based on these criteria, welfare aspects can be assessed using the following:

- A Low
- B Medium
- C High

34) Work

Work could be a form of exercise, but one that is not natural to an elephant's repertoire of behaviour could also have harmful effects.

Based on these criteria, welfare aspects can be assessed using the following:

- A No work + free ranging
- B Patrolling
- C *Kunki* for human–animal conflict mitigation
- D Safari
- E Timber
- F Standing/blessing for pooja (devotional service)
- G Procession
- H Walking for blessing and begging purposes

35) Food

Wild elephants are reported to feed on more than 75 species of plant foods (Shoshani and Eisenberg, 1982) and perform a number of manipulations with their trunk, legs/ tusks prior to eating (Kurt and Garai, 2007). Food provided for elephants should take care of nutrition, opportunity for exercise (during food preparation such as bending, pulling, breaking, etc.) and expression of natural behaviour that are seen while foraging and feeding.

Based on these criteria, welfare aspects can be assessed using the following:

- A Free ranging + stall fed
- B Only stall fed

36) Type of food (Number of items)

Stall feed may not be able to replicate the wide diversity of food that elephants come across while foraging in the wild. Only stall feeding compromises the required diet of the animal as opposed to a free ranging animal. Additional supplements apart from forest food (derived from free ranging) are recommended. In theory, a well-kept captive elephant should be healthier than a wild one, because a caring owner would always ensure the elephant has the right nutritional supplements throughout the year which might not be available naturally.

Based on these criteria, welfare aspects can be assessed using the following:

- A Forest food with supplement
- B Forest food only
- C No forest food, only varieties

37) Use of ration chart

The presence of a ration chart shows the owner's inclination to good management in terms of care and resource use.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
- B No

38) Maintenance of chart

Elephants need a varied diet as per their health and physiological condition, for example, the kinds of food provided during musth or periods of illness. A ration chart shows the interest shown by the management in maintaining a record of the feeding process and its consequences.

Based on these criteria, welfare aspects can be assessed using the following:

- A Maintained regularly (as per seasonal requirement and availability)
- B Maintained occasionally
- C Not maintained

39) Mineral mix given

Elephants need many minerals for normal development and maintenance of health; for example, calcium for healthy tusk development and zinc for healthy feet. Given a captive situation, provision of mineral supplements under expert guidance is recommended.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
- B No

40) Special food given/withdrawn during pregnancy, lactation, musth or rejuvenation

During different stages of growth and reproduction, elephants have varying nutritional requirements (Olson, 2004). Effective management calls for recognising these needs and providing for the same. For example, during pregnancy or lactation elephants need a protein-rich diet for better growth of the foetus and for lactation.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
- B No

41) Visits to cropland

Crop raiding is said to be a contributing factor for human–elephant conflict (Sukumar, 2000). This behaviour when exhibited by captive elephants adds to an already deteriorating relationship. Additionally, visits to croplands may be an indication of insufficient food (in terms of quality or quantity) and inadequate foraging space.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
- B No

42) Reproduction

Only elephants with optimal physical condition within appropriate age classes (Olson, 2004) are capable of reproducing while its absence among the same may be related to non-social stress such as long durations of chaining, frequent shifting of animals,

bad handling by the keeper, and/or excessive body weight or malnutrition (Clubb and Mason, 2002).

Female

i) Adult female cycling

Acyclic females within reproductive age-class indicate deficiency in terms of social/nutritional and management features.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

ii) Has female elephant been exposed to male?

Female exposure to males is an indication of appropriate group structure (with variations of age and sex classes) in captivity. This implies opportunity for unconditional exposure of female to male which may result in regular cycling of females. It also reflects on the care of the owner towards the elephant in providing for a natural expression of its lifecycle. Resource constraints should not be offered as an excuse for unavailability of male exposure.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

iii) Has the female given birth?

A normal reproductive state may be a sign of healthy psychological and physiological condition.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

iv) Was mating observed?

Observation of consorting with male is important in understanding the needs and behaviour of the particular elephant. The knowledge of mating is one of the most important aspects in providing necessary pregnancy-related management. As this may be difficult to observe in free-ranging elephants, extra efforts are needed to observe mating and recognise the signs of pregnancy. The management has to be specifically trained to observe these patterns as there are cases where pregnant females were used for logging and tourism-related operations because the management did not know that the females were pregnant and consequently it resulted in abortions (Brown, 2000).

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

v) Source of bull

Genetic diversity may be maintained when the male is wild as against a single male that is kept in the institution.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Wild
 - B Captive
 - C No bull of wild/captive present
-

vi) Presence of female elephant during delivery

The presence of other females during delivery helps in de-stressing the mother and stabilising her. In zoos, there are instances of the mother having killed the calf in the absence of other cows. Their presence also contributes to communication between females. They learn by watching. If the mother was raised in isolation, she may get agitated in the presence of the calf and end up killing it. Death can also happen when the mother tries to kick the placenta off the newborn. The presence of cows helps in the formation of social bonds of the herd with the newborn calf even among unrelated females (Gadgil and Nair, 1984).

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

vii) Number of calves born

A healthy individual would have given birth to an optimal number of individuals during the course of her breeding age.

Based on these criteria, welfare aspects can be assessed using the following:

	Age class of mother (Years)	No. of calves born
A	51–60	7
B	51–60	5
C	51–60	3
D	51–60	1
E	51–60	0
A	41–50	5
B	41–50	3
C	41–50	1
D	41–50	0
A	31–40	3
B	31–40	2
C	31–40	0
A	21–30	2
B	21–30	1
C	21–30	0

viii) Calving interval

The calving interval observed in the wild is considered the healthiest as it is subject

to a number of inter-related factors contributing to its selection in the course of evolution. Any deviation from this is an indication of an unhealthy animal and/or improper condition.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 3–4 years
 - B 4–5 years
 - C 5–6 years
 - D 7–8 years
 - E > 8 years
-

Male

i) Has the male elephant been exposed to a female?

Female exposure to a male is necessary as it has been shown to increase testosterone levels. Studies in the wild have shown that males come into musth after prolonged association with female groups (Poole, 1987). In addition, lack of exposure may result in the male ‘not knowing’ how to mate (Clubb and Mason, 2002). Exposure of males to females might also be an indication of normal group structure in that institution. It should also be noted that mere exposure does not guarantee successful mating.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

ii) Has the male sired an offspring?

A male which has sired offspring shows healthy physiological and psychological upbringing. Conversely, the reason that captive males are not reproductively active may be due to inaccessibility to females, reproductive pathologies, low sperm quality, malnutrition or excessive body weight apart from physical and psychological stress (Clubb and Mason, 2002; Kurt and Garai, 2007). In an institution with more than one male, it may not be necessary that each male should sire offspring as even in the wild only the adult dominant bulls get to copulate.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
 - C Not sure since the male could also be with wild females
-

iii) Musth

A male elephant comes to musth only when he is of a certain age and physical condition (Kurt and Garai, 2007). Any adult elephant that does not come into musth or musth has ceased after being captured from the wild may be a cause of concern. From the welfare point of view, the period of musth can lead to mismanagement due to lack of knowledge. It is necessary for managers to enrich their knowledge of musth and related aspects. These could include duration, frequency and season of musth.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Adult-Yes
 - B Adult-No
-

iv) Mating during musth

It has been observed in the wild that adult males in musth mate. Wild young males are not reproductively active till they reach around 20–25 years of age (Sukumar, 2000), but there are reports of non-musth males mating with females in captivity (Kurt and Garai, 2007). These non-musth males are sometimes younger. If an adult bull which is in musth is not allowed to mate, it could result in stereotypy. Social behaviour in wild bulls increases during musth periods (Kurt and Garai, 2007).

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

v) Behaviour during musth

Certain musth bulls become aggressive in the periods of musth; however, it is suggested that proper keeping can reduce the aggression of musth bulls (Poole, 1987). Behavioural changes have been observed during musth, with incidence of aggression towards other animals/humans reported (Venkataraman, undated). Aggressive musth bulls can be particularly dangerous for the handler and public in general.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Still manageable/predictable
 - B Unpredictable and violent/disobeys
-

vi) Handling of musth

Lack of knowledge on maintenance of musth bulls can lead to particularly harsh management of the animal such as inducing treatments of the use of drugs to calm the animal, isolation, starvation, continuous flogging, hard work, piercing with ankush on sensitive spots, etc. Efforts need to be made to handle in ways that do not compromise the animal's welfare during musth.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Isolated + both legs chained
 - B Long chain tied to one leg only
 - C Allowed to free range, no extra management needed
-

vii) Injured/killed a human during musth

Safety concerns become important when handling musth bulls. Care should be taken to minimise any injury or killings of humans. Instances of such occurrences indicate poor management of the elephant. Injuries may sometimes also be accidental.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

viii) Post-musth

Injuries or wounds on post-musth elephants may show that the animal was ill-treated during the period of musth by the management. Inflicting wounds or compromising on health issues to subdue the elephant in musth has been observed (Kurt and Garai, 2007).

Based on these criteria, welfare aspects can be assessed using the following:

-
- A No injuries on the animal
 - B Moderate injuries/infections
 - C Severe injuries
-

43) Disease/injuries/medical problems

Captive elephants are susceptible to a characteristic set of diseases or disorders that are commonly reported as a consequence of their lifestyle (Kaufman and Martin, in press). These include obesity, foot-related injuries, tuberculosis, nutritional deficiencies, arthritis, etc. Additionally, they are also prone to diseases and disorders that occur in the wild. Injuries can be classified on the location of injury (trunk, temporal, elbow, ear, foot, other), nature of injury (laceration, abrasion, contusions, puncture, abscess), and type of wound and age of wound.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

44) Frequency of occurrence of disease

A high frequency of diseases or injuries in the elephant shows that the underlying cause may not have been addressed. Poor management and welfare of elephants leads to neglect of health.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Common
 - B Occasional/No apparent pattern
 - C Rare
-

45) Implications of medical problems

Diseases should be clearly identified under either infectious diseases or non-infectious diseases. Prolonged distress due to continued illness reduces the elephant's well-being. There can be a gradation based on the acuteness of the impairment and consequences of further health impairment for the animal. The occurrence of such instances may imply ineffective veterinary care and/or poor interest by the management.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Non-curable and leads to further health problems
 - B Non-curable but leads to no further health problems
 - C Easily curable
 - D No medical problems
-

46) De-worming

Elephants are known to be hosts to a variety of intestinal parasites. In addition, stall feed handled by humans increases chances of contamination. Parasitic load, if left untreated, combined with further incidence of parasitisation, compromises the health of elephants. Hence de-worming is a must for captive elephants.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

47) Frequency of de-worming

Regular de-worming reduces infestation by intestinal parasites and increases general health of the elephant. Infrequent de-worming may not completely achieve the objective. An ideal frequency of de-worming is twice a year.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Ideal (twice a year)
 - B Less ideal (once a year)
 - C Infrequent (once in 1–3 years)
 - D Never
-

48) De-worming pattern

Adherence to the prescribed de-worming schedule shows the care of the management for the elephants. Lack of resource should not be used as an excuse to not follow the prescribed schedule.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A As prescribed
 - B Not according to prescription
 - i Half of the prescribed amount (annually)
 - ii Quarter
 - iii <Quarter
-

49) Vaccinations

Prescribed immunisations against prevalent diseases are considered a must. They act as a preventive approach particularly for anthrax (once a year), tetanus, rabies, haemorrhagic septicaemia and foot and mouth disease. Preventive action reduces future resource use/ loss and maintenance of the health of the elephant.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

50) Frequency of vaccinations

Regular vaccination results in successful elimination of disease incidence. An irregular vaccination schedule may result in the objective not being completely achieved.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Regularly (on prescription)
 - B Irregularly (unplanned)
 - C Never
-

51) Oiling of the feet and head

The practice of applying oil to different parts of an elephant's body is based on the premise of its use as a fly repellent and an antiseptic. It prevents all forms of foot related infections. It also prevents overgrowth of the cuticle and flies from laying eggs in the skin folds and openings.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

52) Frequency of oiling

Elephants are known to be prone to foot diseases and skin infections. Hence, regular oiling is recommended. Better health/skin conditions are possible when oiling is regular.

Based on these criteria, welfare aspects can be assessed using the following:

A Regularly (once every 2–3 days)

B Irregularly (done when needed)

C Never

53) Blood, urine, dung sample (for detailed health check-up)

Health check-ups which include blood, urine and dung samples enable thorough assessment of health and physiological condition over many parameters such as oestrus cycling, biochemical profiling, tests for pathogen occurrence, etc. Hence a proper medical regime must be set up. Anaemic individuals or those suffering from chronic disease can be monitored with ease.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

54) Frequency of sampling

Blood and urine sampling and tests are recommended at least once a year for tuberculosis (Anon., 2003). Also, dung samples should be tested at least once in 3–6 months.

Based on these criteria, welfare aspects can be assessed using the following:

A Regularly (on prescription)

B Irregularly (when occasion arises)

C Never

55) Measurements for body weight (to determine health, nutritional adequacy of diet)

Chronic and prolonged diseases need to be diagnosed and progress of treatment monitored, which can be done by measuring body weight. Cases of malnutrition and obesity will also come to light through a veterinary examination. It will also help in monitoring the growth of the animal and to prescribe medicines. Where accessories for weighing are not available, the results from body measurements can be used to calculate body weight.

Based on these criteria, welfare aspects can be assessed using the following

A Yes

B No

56) Frequency of body weight measurement

Body weight measurement is advised once in six months covering two seasons, according to change in food availability and physiological condition (musth, lactating mothers, etc.) of the animal. Regular body measurement may help in predicting body weights.

Based on these criteria, welfare aspects can be assessed using the following:

- A Regularly (once a year)
 - B Irregularly (once every 2–3 years)
 - C Never
-

57) Veterinary care

This aspect could reflect either a positive or a negative state of welfare. If the animal is not exposed to veterinary care, it suggests that either veterinary care is not available or the animal is in good condition, hence not needing medical attention. However, to perform such practices as de-worming, vaccination and other health protocols, veterinary care is necessary.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

58) Frequency of veterinary visits

Depending on the situation, at least a weekly visit is necessary. This schedule is linked to the living conditions of elephants, which may lead to foot and stomach-related disorders. Timely intervention will help in proper and timely medical attention being delivered.

Based on these criteria, welfare aspects can be assessed using the following:

- A Daily
 - B Twice weekly
 - C On call
 - D Irregular
 - E Never
-

59) Veterinary Assistant (instead of veterinarian for routine health checks)

In the absence of a permanent veterinary doctor, at least a qualified and experienced assistant may play an important role. With the availability of an assistant, the medical regime could be strictly followed.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

60) Frequency of visits by veterinary assistant

Strictly following a medical regime may require the presence of or regular visit of a veterinary assistant.

Based on these criteria, welfare aspects can be assessed using the following:

- A Daily
 - B Twice weekly
 - C On call
 - D Irregular
 - E No
-

61) Veterinarian's years of experience

Not only are the years of experience important but also the number of animals treated, his/her enthusiasm and any further education concerning elephants will help. Handling by inexperienced veterinarians may lead to the prescription of irrelevant drugs or incorrect treatment.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A >30 years
 - B 20–30 years
 - C 10–20 years
 - D 1–10 years
 - E <1 year
 - F No experience
-

62) Veterinarian's experience with specific animals

Unique physiology, large body size and sensitivity to compatibility of drugs make the elephant a very special animal. The veterinarian who has large experience in treating elephants is more valuable than someone who has not.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Elephants/Wildlife veterinarians
 - B Horses
 - C Cattle + sheep + dogs
 - D Poultry
-

63) Availability of facilities at the institution/site of elephant keeping

Facilities play an important role in healthcare. Non-availability of facilities exposes the animal to difficult situations. For example, if the mahout has no accommodation or if his quarters are very far from the camp, he will not be in a position to look after the animal well.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

64) Type of facilities

The facilities measured in this parameter are:

1. Veterinary Care Unit
2. Staff Quarters
3. Work Shed
4. Cooking Shed
5. Food Shed
6. Provision Room

7. Kraal
8. Animal Stands
9. Camp Site
10. Tethering Site
11. Communication Facilities
12. Others

All the facilities collectively support the welfare of the elephants.

- A All facilities are present
 - B Only 8 elements
 - C Only 4 elements
 - D Less than 4 elements
-

65) Status of facilities with respect to maintenance and upkeep, and provision of equipment

While the availability of the facilities is important, their condition plays an equally important role. If they are outdated or not maintained properly, then it is the same as non-availability of these facilities. The classification is based on the usability of the facility. It is arranged in an order of decreasing usability with regard to the condition of the facility.

Based on these criteria, welfare aspects can be assessed using the following:

- A Good
 - B Average
 - C Bad
 - D Not applicable
-

66) Maintenance of service, clinical and other records

It helps in identifying the treatment protocol, records experiences through documentation and helps in evaluating the success of a method. It is equally important to maintain registers on the number of mahouts, behaviour of elephants and conditions.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

67) Frequency of maintenance

Regular maintenance is a source of learning and can help in countering emergencies. Since frequency is relative, a time frame is difficult to fix.

Based on these criteria, welfare aspects can be assessed using the following:

- A Regularly (weekly)
 - B Irregularly (once a month)
 - C Rarely (random)
 - D Never
-

68) Quality of record keeping

Good record keeping is a sign of good management. It shows sustained efforts to upkeep scientific interest in the elephants and their care. Record maintenance is arranged in a decreasing order based on the number of features recorded (including procedures followed for that feature) and updating of these records.

Based on these criteria, welfare aspects can be assessed using the following:

- A Good
 - B Average
 - C Poor
-

69) Funds required

A system where every natural process of an elephant is taken care of with no extra cost is better than one in which the elephant is subjected to unnatural processes, the maintenance of which turns out to be more expensive. Some of the features to be considered regarding availability of funds are:

- 1) Whether funds are used only to supplement (along with free range) in the institution?
- 2) Hiring of veterinary doctor specifically for daily check-ups, and facilities related to healthcare
- 3) Salary of mahouts and their quarters
- 4) Money spent on aspects such as de-worming, vaccination, oiling, etc.
- 5) Expenses for monitoring/supervision
- 6) Training mahouts/owners/managers/veterinarians
- 7) Welfare measures for personnel—insurance/pension
- 8) Incentive given to mahout for training—monetary benefits and better working atmosphere.

Additional facilities which provide ideal conditions should be considered although additional cost may be involved. Fund requirement should look at cash flow (are they operating on a hand-to-mouth basis with no buffer?) and how they are managing their cost (investing time into cost recovery without impacting their elephant husbandry). Essentially, this exercise is to see if the location is sustainable.

Based on these criteria, welfare aspects can be assessed using the following:

- A Funding which takes care of ideal conditions mentioned above
 - B A difference of 25%
 - C A difference of 50%
 - D A difference of greater than 50%
-

Mahout

1) Percentage of an elephant's life that a mahout has cared for

The longer the time a mahout spends with the elephant, the stronger is the relationship between the two. Frequent change of mahouts can result in stress for both the animal and mahout to familiarise with each other. The quality of time (opportunity to interact and communicate) spent with the elephant is more important than just the time spent. A protocol of daily routine will help in understanding this relationship better.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Above 40–50%
 - B 30–40%
 - C 20–30%
 - D 10–20%
 - E 5–10%
 - F 2–5%
 - G 1–2%
 - H 0%
-

2) Total experience as a mahout (in relation to his age) %

The greater the experience of the mahout with elephants and the quality of his experience, the better it is. Experience in handling elephants (age, sex and temperament variations) also adds to the experience of the mahout. Those who have spent 70% of their life with the elephant are considered satisfactory. Also, the age at start of work with elephants usually should be around 10–15 years. The greater the age of entry into this job, the lesser will be the value to the total experience.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 60–70%
 - B 50–60%
 - C 40–50%
 - D 30–40%
 - E 20–30%
 - F 10–20%
 - G <10%
-

3) Reason why mahout pursued the profession

If a mahout has joined the profession of his forebears, then it can safely be assumed that he has a lot of experience in managing elephants. If he pursues the profession out of his own volition and tradition, then he is likely to take better care of the elephant.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Tradition and interest
 - B Interest
 - C Tradition
 - D No other job
-

4) Community

Experience has shown that some tribal communities consistently manage elephants successfully. However, this needs to be supported with a larger dataset. With changing social management systems, this need not hold good these days.

Based on these criteria, welfare aspects can be assessed using the following:

- A Tribal
- B Others

5) Traditional family occupation

A mahout's family background adds to the mahout's experience even before he begins work on an individual elephant in a formal manner. The number of generations involved in this profession helps in refinement. It is possible for them to develop an instinct and understanding about the animal rather quickly.

Based on these criteria, welfare aspects can be assessed using the following:

- A Mahout
- B Others

6) Related to another mahout or cawadi

Interpersonal relationships of the mahouts, with increased trust and comfort may benefit the elephants in turn. Individual experiences can enrich the overall knowledge of the mahouts about the health and behaviour of the elephants.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
- B No

7) How did the mahout get trained for this profession?

Since no formal training mechanism is available to mahouts, this profession involves on-the-job learning. Who teaches the mahout and with whom he has been working adds value to his overall expertise.

Based on these criteria, welfare aspects can be assessed using the following:

- A By experience
- B Through training program
- C No experience/no training

8) Annual salary

Sufficient money for the mahout to support a family is recommended. Ideally, a well paid and well-cared for mahout will tend to be better at his job. However, it is important for the management to evaluate his working standards and his relationship with the elephant. The per annum salary starts with Class III Government Scale. The salary should be based on working hours, over-time wages, medical and risk allowances for high-risk animals (25%), insurance, skill/performance-based hike/promotion, accommodation availability, pension/welfare fund and contemporary cost of living.

Based on these criteria, welfare aspects can be assessed using the following:

- A Rs. 60,000 p.a.
- B Rs. 40–50,000 p.a.
- C Rs. 30–40,000 p.a.
- D Rs. 20–30,000 p.a.
- E Rs. 10–20,000 p.a.

9) Education

Education adds value to a person's life and leads to better living conditions. Changing socio-cultural scenarios necessitate that mahouts have minimal education. But because this job involves handling animals, a high level of formal education need not be the only criteria. A well-educated mahout may not be interested in continuing as a mahout. In fact, the quality and kind of education can have varying effects on mahouts. Basic literacy may however be necessary.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A With good reading and writing ability
 - B With manageable reading and writing ability
 - C Reading ability only
 - D No reading ability
-

10) Children

The more the number of children the mahout has, the more are the resources needed to care for the family. This consequently results in a lower standard of living.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 2 children
 - B 2-4
 - C 4-6
 - D 6-8
 - E 8-10
 - F Above 10
-

11) Language

A person who knows a large number of languages might help in places which follow a multilingual system. For an elephant that is exposed to different regions, a mahout with knowledge of many languages might be able to work comfortably with the elephant. Knowledge of different languages should not be used for personal benefits such as soliciting tips from tourists.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A 3-4
 - B 2
 - C 1
 - D None
-

12) Knowledge of using commands

If a mahout has good knowledge of commands, both verbal and physical (sign language should be minimal or absent) that are used to control the elephant, it enables better bonding with his elephant. The knowledge/usage of the commands should be for the welfare of the animal, rather than dominating/misusing it to impose corporal punishment or for personal benefit. With the future in view, a uniform system/ language of commands as well as a protocol for using verbal and physical commands should be developed for the country.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Good
 - B Average
 - C Bad
 - D None
-

13) Number of hours spent/day with elephant

The quality of time spent with the elephant is more important than the number of hours. More hours spent with the elephant might reflect a bad situation for an animal if its mahout does not treat it properly. This condition may change if the animal is left for free-ranging. We recommend the mahout be available for at least 8 h. We define spending time with the elephant as not necessarily staying with the elephant, but that the mahout is available when needed.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Above 18
 - B 12
 - C 10
 - D 8
 - E 6
 - F 3
-

14) Insurance

For the mahout, medical, life and family benefit pension/insurance are required. Group policies with low premium should be arranged.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Yes
 - B No
-

15) Source of insurance

The source of insurance could play an important role in the mahout's budget and the resultant welfare of him and his family. If there is provision for payment of premium from the employers, this would reduce the economic burden on him.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Employer
 - B Self
-

16) Level of insurance coverage

The mahout must be insured for an amount that will meet his regular medical expenses as well as for expenses incurred due to severe injuries. He/the owner should discuss with insurance companies the technical details.

Based on these criteria, welfare aspects can be assessed using the following:

-
- A Major part of the recommended
 - B Half of the recommendation
-

- C Quarter of the recommendation
 - D <Quarter of the recommendation
-

17) Reports of bad conduct on part of the mahout

Bad conduct towards the elephant, owner, public and co-workers could have a negative effect on the elephant and personal management. There could be a provision to understand the reason related to such behaviour.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

18) Consumption of alcohol

Increased incidents of aggression and killings by elephants of their mahouts have been reported when the mahouts were under the influence of alcohol (Kurt and Garai, 2007). Alcoholism in mahouts should not be encouraged due to its ill effects on their health and social life, as well as the elephant's welfare. Many mahouts have been found to function under the influence of alcohol but they should be dissuaded from continuing this process, considering the long-term benefit for both the elephant and mahout.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

19) Timings of consumption

During working hours, consumption of alcohol is undesirable. It reflects a lack of responsibility and care for personal health and life.

Based on these criteria, welfare aspects can be assessed using the following:

- A No consumption
 - B After work
 - C Before work
 - D While working
-

Ownership

1) Animals that have died in owner's custody due to unnatural conditions

Unnatural deaths occur when the commercial value of the animal decreases (due to its poor temperament or failing health and hence the reduced market value) and expense incurred for the animal increases.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

2) Whether animal is registered

Registration is essential for developing welfare norms for elephants and mahouts by quantifying the extent of services and inputs (funds) required.

Based on these criteria, welfare aspects can be assessed using the following:

- A Yes
 - B No
-

3) Microchipping

Microchipping gives a permanent, non-tamperable identification system to officials for registering elephants. This is done without mutilating/creating physical hindrances to elephants.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

4) Whether elephant is medically insured?

The benefit of medical insurance is more towards the owners rather than the elephants. For accidental deaths of elephants, insurance companies pay the compensations through the policy. However, when a financial crisis arises for the owner due to an accidental death of the elephant, it can be severe. The same may be managed through this policy.

Based on these criteria, welfare aspects can be assessed using the following:

A Yes

B No

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Biographical sketches



Surendra Varma is working as a Research Officer at the Asian Elephant Research and Conservation Centre (AERCC, a division of Asian Nature Conservation Foundation), based at the Indian Institute of Science, Bangalore, South India. He is also a member of the IUCN/SSC Asian Elephant Specialist Group. He has extensive experience in carrying out elephant and other large mammal population, habitat and distribution studies and surveys in India, Myanmar and Vietnam. Varma has been actively involved in carrying out capacity building in elephant census methods, habitat mapping and survey techniques for numerous participants from India and other South-East Asian countries. He is also involved in developing conservation technology tools as well as a comprehensive study on the captive elephant population, their welfare and management in India.



Sujata Srinivasiyengar has a Master's degree in genetics and plant breeding. She has been interested in animal-related issues, being a volunteer for a local animal welfare NGO. She had a brief stint as a Junior Research Fellow (JRF) at the Wildlife Institute of India (WII), Dehradun, and as a field biologist in Velavadar on a project on the Ecology of the Indian wolves (*Canis lupes pallipes*), supervised by Dr. Y.V. Jhala of the WII. Her future interests would be the application of ethological studies in the study of animal cognition.



Jeroen van de Brand, a Dutch Wildlife Management student, of the Van Hall Institute (a University of Professional Education for Agriculture, Food Technology, and Environmental and Animal Sciences, Netherlands) did a field internship with Compassion Unlimited Plus Action (CUPA) on the subject of captive elephant management for 6 months, helped to compile information on elephants in captivity. He helped ANCF/CUPA captive elephant research team in processing and analysing data. He is currently based in Amsterdam and has taken a minor in para-veterinarianism.



Suparna Baksi-Ganguly has been in the field of animal protection and welfare since 1978. In 1991 and 2000, she co-founded Compassion Unlimited Plus Action (CUPA) in Bangalore and the Wildlife Rescue and Rehabilitation Centre (WRRC), respectively. CUPA works closely with the State and Central Government on various practical and policy matters on animal welfare related issues, besides having its own Veterinary Hospital and Shelter. WRRC works with various orphaned, confiscated and injured small animals, birds and mammals. She is a member of the Protected Area Development Fund (Dept. of Forests & Wildlife, Karnataka), Bannerghatta Rehabilitation Centre Project at WRRC (in collaboration with the Dept. of Forests & Wildlife, Karnataka) and Advisory Committee of the Bannerghatta Biological Park (constituted by the Dept. of Forests & Wildlife, Karnataka)



Dr. Shiela Rao, graduated from the College of Veterinary Sciences, Hebbal, Bangalore. She was the recipient of the Indian Council of Agricultural Research (ICAR) Scholarship and subsequently went to the Jersey Wildlife Preservation Trust in Jersey, UK, to do a course in Primate Conservation. Since 1982, she has been involved with animal welfare and the veterinary field and has worked as a veterinarian with the Society for Prevention of Cruelty against Animals (SPCA) now called Karuna in Bangalore. In 1991 and 2000, she co-founded CUPA and the Wild life Rescue and Rehabilitation Centre (WRRC), respectively. She was nominated by the Committee for the Purpose of Control and Supervision of Experiment on Animals (CPCSEA), a national body to be a member of Institutional Ethics Committee to various well-known institutions and research stations.

Welfare and management of elephants in captivity— Insights and Recommendations

Surendra Varma¹ and Deepika Prasad²

Abstract

We derive insights into the welfare and management of captive elephants through the Workshop on Welfare Parameters and their Significance for Elephants in Captivity and their Mahouts. This is based on the knowledge of elephants and mahouts generated and shared through informal discussions and debates and thus a document of recommendations was created. It draws lessons from the biology of the species and adopts practical standards of keeping them in captivity. These insights and recommendations come under the categories of space, facility, manpower and funds. Overall, we have identified the ecological or biological needs of the elephant through this exercise.

Background

A workshop was held on welfare parameters and their significance to captive elephants and their handlers. Participants from different layers of elephant ecology, conservation and management were a part of the program. Scientists who have worked with Asian elephants in the wild for a substantial period, welfare personnel who have been associated with welfare issues for a long time, veterinary doctors who have specialised knowledge and interest in the species or other wildlife, and policymakers/managers who have experience in managing elephants from different management regimes were present. For an effective reviewing process, four working groups were formed. These formal groups comprised specialists who discussed and focused on their areas of interest with the objective of evaluating and improving the welfare parameters for captive elephants.

During the workshop, a lot of information came forth during casual talk and informal discussions among the experts. It was decided to construct these insights into specific recommendations. The insights form the basis of these recommendations. Relevant experiences and even educated hunches and guesswork form a part of this. As the discussions were biased towards certain sectors, inputs from working-group discussions were also used for other sectors. The bias arose from the fact that the knowledge sprung from the kind of field exposure and individual experiences a person received, which resulted in certain sectors being missed. The document's first step is towards providing a larger canvas for captive elephants. It is to address broader questions and provide guidelines. Eventually, it is to draw lessons from the biology of the species and adopt practical standards of management.

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Recommendations on captive elephant management could be classified as those that come under the categories of space, facility, manpower and funds.

For the sake of convenience we have categorised the recommendations as under:

- 1) Biological needs of the elephant
- 2) Veterinary and healthcare needs of the elephant
- 3) Manpower-related needs of the elephant

Biological needs

Shelter size/Space

Recommendations:

1. Elephants in captivity should be allowed access to at least 1% of the space they have in the wild
2. The minimum size of the shelter should be decided on the minimum number of elephants kept in an establishment. Roughly 1.25 acres should be available for each elephant
3. Provision must be made for varied habitat within an enclosure to give an opportunity for the elephant(s) to experience the same by allowing them to range free in a suitable space for a period of time
4. Elephants are social (herd) animals, hence their space/shelter should not be considered individually but for the group. The space should suffice for their interaction and social space requirements
5. Ideally, elephants must not be chained within the shelter as restricting their movement could add to stress. Chaining can be considered only in extreme cases such as in performance of veterinary procedures
6. During public performance utmost care needs to be taken while fixing chains and checking for injuries in that region. Wrongful and repetitive fixing on the same region leads to injuries that are difficult to treat/heal
7. There should be a minimum number of elephants in every elephant-keeping establishment. There should be a mix of males and females, as adult males indulge in fights for dominance. The absence of females can lead to inappropriate behaviour
8. Sufficient space should be provided for an animal to ward off aggressive interactions within the enclosure

Insights:

A minimum area of ecological space is essential for each elephant. It is considered that elephants being herd animals, their spatial needs need not be considered individually but as a group and hence the space in question is 'shared space'. The shared space should suffice for interaction and for social space requirements. The shelter space is the basic space for movement, and not for foraging.

The estimated elephant density for prime elephant habitats (Sukumar, 1989) is 1.7 animals/ km² (Varman et al., 1995) and this works out to be 1 elephant for 125 acre. If elephants are kept in captivity at least 1% of the natural space has to be provided to them for shelter. In addition, the concept of an elephant home range should also be considered; if this aspect is also included, the recommended area provided to a captive elephant should be more than 1.25 acre. Home range size of an Asian elephant is reported to be in the range 100-300 km² (Sukumar, 1989); 160–400 km² for adult males and around 250–320 km² (Williams, in press) or 40–60 km² (Kurt and Garai, 2007) for females, the size being subject to a number of ecological variables.

Permanent or long-term chaining has been linked to development of stereotypic weaving among elephants, a behaviour which is also linked to social isolation through restriction of movement (Kurt et al., 2003/2004). African elephants in Oakland Zoo whose movements were not restricted to indoors showed greater species-typical activities and reduced stereotypical swaying (Kinzley, in press).

Shade

Recommendations:

1. Natural shade type (trees/thatched roof) is best for elephants as it helps them stay cool
2. Ideally, all elephants should be allowed to range free so that they can choose their ideal shade and its type during the day
3. Optimal shade should be provided for orphaned calves or old/diseased elephants during the day if they cannot be allowed to range free
4. Sick and old elephants should not be neglected as excess heat and sunlight could aggravate their weakness

Insights:

Kurt and Garai (2007) observe that wild elephants rest in the shade of large trees during the hottest parts of the day. Keeping elephants requires awareness of different requirements of every individual. The dynamic nature of temperature and its effect on elephants is the basis of the need for shade for the elephants. While all elephants should be allowed to range free to choose their shade and type during the day, special consideration should be given to very old elephants, diseased ones and orphaned calves as they cannot be allowed to range free.

Walk/Exercise

Recommendations:

1. Elephants should exercise/walk to stay fit and healthy
2. Individuals that spend most of the day standing (as in temples) should be walked at least once a day, particularly during cool hours (for example, 6:00–8:00 a.m./4:00–6:00 p.m.), preferably in places with varied vegetation and natural substrates
3. Elephants should not be made to walk long distances continuously at any time of the day or night and in any case not more than 8–10 km a day
4. This distance should be reduced if the terrain is hilly and is exhausting for the elephants
5. If they are forced to walk (as in the case of travelling/begging elephants) there should be a protocol to break frequently in cool places to enable them to radiate heat to cool off
6. A walking elephant should be given ample water and food. The problem arises for elephants, such as those used for travel/begging, in which case, they are walked long distances. Their itinerary should include specific places with provision for both food and water

Insights:

Elephants in the wild walk especially for foraging. Thus, by giving primary importance to food, they reduce the total distance they walk per day, and choose optimal shade while walking or foraging, limit their speed of walking and are constantly providing themselves with food and water as per availability. In the wild or in a range free situation, the elephant while walking gets its share of optimal shade, exercise, food and water. But in a captive condition where all these setups are removed, walk is only

for the purpose of exercise. So the questions that arise are: when the elephant should be walked, where it should be walked and for how long and what are the possible fixed times and fixed distances.

It is very important for elephants to maintain their body temperature and avoid overheating. Hence, prolonged walking is not feasible. Also, in a situation where the animals cannot be left free for the major part of the day, the combination of activities seen in the wild can be recreated to a certain extent by allowing the animals to range free for a certain duration to forage/exercise/socialise in available natural conditions.

Food

Recommendations:

1. Food should be provided to the elephant at proper intervals throughout the day to avoid obesity or malnutrition
2. Natural food is best even if it is a stall-fed animal but it can be supplemented with cooked food as long as hygiene is not sacrificed
3. Natural food also provides scope for exercise while preparing the food and eating it. It is a learning process and also a source of interaction among the members of the group. Cooked food should be given only as a secondary source. In addition, this kind of exercise-based food, which enables healthy involvement of the elephant in feeding, is encouraged
4. Proteins, minerals, vitamins and carbohydrates should be given to captive elephants
5. The diet should always be monitored as protein-deficient and energy-rich food along with lack of exercise causes obesity

Insights:

Wild elephants spend 80% of the day in foraging. Stall feeding effectively frees up this time, leaving the elephants little to do during the rest of their normal activity pattern (Veasey, 2006), a situation seen among captive elephants. Since elephants have poor digestion, they need a variety of food at frequent intervals.

The quantity and quality of the food required by the elephant vary depending upon its age, reproductive state and physiological health. For example, food, in practice, is withdrawn for bulls in musth, while lactating females need protein-rich food and stressed individuals or newly captured ones from the wild need rejuvenation food.

The diet should always be monitored as protein-deficient and energy-rich food given in many temples or under private ownership makes the elephant obese due to lack of exercise. Exercise-based food helps in keeping the muscles active and forms a part of the elephants' psychological well-being as well. Elephants also use food as tools (branches to scratch and shower grass on their head to soothen the skin). Hence, a range of foods should be made available to an elephant. Elephants in Oakland Zoo showed increased periods of feeding and foraging when food was provided throughout a 24-h period at known intervals (Kinzley, in press).

Water

Recommendation 1 (Drinking):

1. Elephants should be provided large quantities of drinking water all through the day
2. Elephants should be allowed to drink water whenever they feel the need for it
3. A separate dedicated water supply has to be a part of the establishment

Insight 1:

Wild elephants have been observed to have home ranges which included at least one water source; drinking and bathing at least once a day (McKay, 1973). In addition to their biological need, water helps the animal to maintain its body temperatures. Many elephant-keeping establishments depend on local/municipal bore wells or taps as a source of drinking water. This can be due to change or scarcity. In effect, the elephant will get its due only after the needs of the humans are met.

Recommendation 2 (Bathing):

1. Elephants should be bathed at least once a day for a minimum duration of 30 min.
2. Large water bodies for bathing purpose (preferably with flowing water) should be near enough for easy access
3. Elephants should be able to immerse their entire bodies under water to make sure every part of their skin is cleaned and scrubbed

Insight 2:

Bathing is also an apt way of maintaining body temperature. Bathing elephants in captivity makes the skin healthy, affords time for relaxation, interaction and play with other elephants. It also enriches the bond between the elephant and the mahout.

Provision of suitable rubbing posts/wallows: such landscape features may assist in maintaining good skin condition (Kurt and Garai, 2007). Mahout's interaction with the elephant is an integral part to bond and bathing activity is one such interaction. However, it should not interfere with socialising among other elephants/other species-specific activity among animals.

Learning and Interaction

Recommendations:

1. Elephants should not be kept alone in captivity. Being a social species, interaction is one of their most basic needs. However, all males should not be put together
2. Elephant calves need to spend a good quality and quantity of time with their mothers and other elephants

Insights:

Learning forms a major part of the social structure of elephants which is enabled by freedom of interaction. Calves learn the way of life as well as the way of their social bonds (following the leader of the herd, subordination, foraging strategies, etc.). Young calves (in the wild or captivity) smell and feel the food the mother is foraging even if they are still suckling. Hence, they learn very early in their life of palatable species and their forms, the knowledge of which sustains them in their future life.

Calves in the wild learn very quickly to follow the matriarch and understand the herd's hierarchy. Both naturalists and veterinarians agree that elephants find a tender shoot or a bamboo amidst a large clump more by smell than by sight. Learning also plays an important role in self identification and individual's position in a group; all these aspects are learnt through interactions among group members. In the absence of the same, inappropriate/aggressive behaviours may emerge which are difficult to control (Poole and Moss, 2008; Bradshaw and Schore, 2007).

Early weaning can be deleterious to the development and learning process of the individual. Early weaned female elephants showed higher percentage of failed/ rejected by-mother calf-births (Kurt et al., 2003/2004). Waiblinger and Konig (2007) report increased incidences of bar chewing among *Mongolian Gerbils (Meriones*

unguiculatus) which were separated from their families before the birth of a second litter. Bradshaw and Schore (2006) link non-normative behaviour among wild elephants to changed socialisation patterns and skewed demography which includes absence of matriarchs, allomothers and irregular herd structures.

Reproduction

Recommendation 1:

1. Resources permitting, elephants should be allowed to breed as long as welfare is not sacrificed. Activities related to the institution (for example, safari rides) should not compromise the welfare of the animal that is in a reproductive stage

Recommendation 2 (Mother–Calf relationship):

2. When a female elephant goes into labour, the presence of other adult females or a small group is important; or at least another female should be by her side/within the same enclosure for the whole time without being chained. This provides moral and physical support to the mother and reduces her stress

Recommendation 3 (Musth):

3. Musth in bulls is a natural phenomenon. It has many age-related variations. Duration and frequency of musth that the bull goes into should be regularly monitored and recorded by the management
4. Institutions with musth bulls need to implement specific keeping enclosures to replace the current practice of chaining/isolation/starvation/physical abuse to control such animals
5. The bull enclosures need to take into account the biological needs of the elephant. Hence, physical (of primary importance)/visible/olfactory/audible communication with females should be ensured
6. If breeding is not an option, necessary procedures must be followed to ensure that the male animal is not subjected to consistent and prolonged stress due to absence of mates

Insights:

There are some well-known instances where the management was not aware that a female was pregnant, and had used such a female in physically exhausting activities like safari rides. This has resulted in many abortions.

It has been observed in many captive conditions that female elephants in labour, when secluded from other elephants, end up killing newborn calves. One of the reasons for this could be that if that particular elephant was raised in isolation and has not learnt the social bonds required, she becomes extremely stressed in the presence of the newborn calf and is aggressive towards it and consequently kills it. Another reason for the infanticide could be that the mother tries to remove the placenta from around the calf by kicking at it. Due to lack of expertise and the absence of other females around her to calm her, the mother may kick the calf so hard enough that it results in the calf's death. Allomothering has been observed among unrelated captive elephants (Gadgil and Nair, 1984).

Studies on wild bulls have shown that only healthy individuals have a long period of musth (Kurt and Garai, 2007). In addition, the frequency of attaining musth is also important. This will imply the bull is being fed well and also that he is in the company of females as it has been shown that bulls come into periods of musth more frequently if they are exposed to females. Bulls in musth are reported to range widely in search of females. Thus, confining or chaining musth bulls can be counterproductive with expression of aggressive behaviour (Williams, in press). Chaining musth bulls has been linked to increased stereotypic weaving behaviour (Kurt and Garai, 2007).

Veterinary and management needs of the elephant

Physiology

Recommendations:

1. Proper studies on physiology will provide insights into digestibility, body structures and functioning. However, when this information is unavailable, decision on welfare should be postponed
2. Considering the physiological needs or constraints, comfortable howdahs should be specially designed to give sufficient aeration for the elephants' back
3. The housing for the elephants should have optimal ventilation so that the elephants can keep cool at all times

Insights:

Barring a few situations, proper knowledge on physiology is lacking; this knowledge may provide insights into digestibility, body structure and functioning. For example, one can adopt some steps, bearing in mind the knowledge of thermoregulation of elephants. While some maintain that elephants do not have sweat glands, a recent electro-microscopic histological study has revealed that elephant's skin possesses sweat glands (Lamps et al., 2001). A majority of these sweat glands are concentrated between the toes, and the remaining are scattered sparsely across the other parts of the body.

Diseases

Infectious and non-infectious diseases:

Recommendations:

1. It is important for the management to know if their elephant is suffering from an infectious or a non-infectious disease
2. In the case of zoonotic diseases, the elephant has to be given immediate and effective medical care, with sufficient precautions to the veterinary doctors and assistants
3. Elephants with infectious diseases should not be allowed to range free in adjoining forests that harbour wild elephants as there is a risk of infecting the whole of the wild population
4. Elephants with infectious diseases should be quarantined from other captive elephants to avoid spreading the disease within the institution. To the maximum extent possible, quarantine should ensure that the social needs of the animal are not sacrificed, keeping in mind the different ways of communication that elephants are known to use

Insights:

There are vast differences in the treatment, handling and management of elephants with non-infectious and infectious diseases. Some diseases are also transferred between humans and elephants (for example, tuberculosis) which renders both the keeper and the elephant at risk. In the case of non-infectious problems such as arthritis, the elephant may pose no threat to humans or other elephants. In this situation, it can be encouraged to interact with other elephants under the vigilance of the management. This will benefit them psychologically.

Specific diseases (example Rabies):

Recommendations:

1. It is imperative that pure scientific research, on specific diseases such as rabies in elephants, be undertaken to solve this problem
2. A protocol should be in place for immediate medical care in the case of incidence

of rabies in elephants. Meantime, regular pre-bite vaccination of cattle-dosage of anti-rabies can prevent any drastic situation, but this has to be carried out throughout the country to be fully effective

Insights:

There is a dearth of information on post-bite remedies for rabies in elephants. A recent development from Sweden confirms that the cattle dosage of anti-rabies vaccination suffices even for elephants, but it is useful only for prevention.

De-worming

Recommendation:

1. It is recommended that de-worming should be administered to elephants in captivity twice a year

Insights:

Elephants are susceptible to certain species of internal parasites. In captive conditions, there are chances of the elephant defecating or urinating very close to their food and later consuming it. Hence, they need to be de-wormed regularly. Since the parasites are species-specific, there are little chances that transfer of parasites can occur between humans and elephants; however, utmost care should be taken to maintain sanitary and hygienic conditions.

Veterinarian's experience with animals

Recommendations:

1. The veterinarian should be trained in handling wild animals and must have experience specifically in treating elephants
2. In instances when such a vet is not available, a veterinarian who has had an experience in treating horses is the next best option

Insights:

Elephants and horses show a similar pattern in treatment and recovery. Hence, veterinarians who have treated and worked with horses previously will be able to do a fair job in treating and handling elephants, in the absence of a wildlife veterinarian.

Record Keeping

Recommendations:

1. Detailed record keeping is mandatory for elephants kept in captivity
2. In addition to maintaining basic records on the age, sex, registration and ownership details, the management should make it mandatory that records are maintained on the number of mahouts the elephant has had, behaviour of the elephant and condition (physical/psychological)

Insights:

This detailed record keeping can give immediate and qualitative information on many aspects of elephant management to the new mahout/owner/manager/veterinarian to understand its behaviour and build strong ties with it. It also helps in keeping tabs on trade and transfer of live elephants across owners and regions. In the case of change of ownership, the new owner/management will be equipped with the information. Also, even where the ownership is the same, if the elephant undergoing some behavioural/ physiological process had undergone such situations earlier, it would have been convenient to handle the situation immediately instead of relying on the memory of mahouts.

Manpower-related needs of the elephant

Mahout

Mahouts are key to effective elephant keeping and management. Any institution owning elephants should be concerned about mahout welfare, as their needs are varied and have not been well documented.

Age of mahout when he began working with elephants

Recommendations:

1. Early exposure to the works and ways of life of a mahout is essential
2. The mahout should have begun work with elephants at 10–12 years of age or at least in his teens

Insights:

Being trained as a mahout is a learning process which is best picked up when he is young. This enables a mahout to spend a maximum amount of time with elephants and his knowledge and comfort with elephants increases proportionally. If mahoutry is a person's family tradition, then he spends a lot more time with elephants and even learns by watching and mimicking his senior family members. He may also get the opportunity to help them while handling the elephant. Hence, early exposure to the works and ways of life of a mahout is essential.

Number of mahouts an elephant needs

Recommendation:

One handler suffices a calf but elephants taller than six feet need two.

Insights:

To answer the question on how many mahouts one elephant should ideally have, it was agreed that most would need two handlers (one mahout + one cawadi). But this also depends on the size of the elephant itself. In Kerala, if the size of the elephant is above nine feet, there are generally three mahouts.

Mahout training, personality development and counseling management

Recommendation:

1. Mahouts need training. This should not just cover their job skills but also their social and family skills. Exclusive courses on anger management/ personality development should be conducted. This should encompass counselling on family issues, alcoholism, a motivation to adopt insurance schemes

Insights:

When there are two or three mahouts for a single elephant, ego and interpersonal relationship problems arise (like one being more literate than the other). These might affect the welfare of the elephants. Counselling for social skills and welfare takes care of emotional breakages, interpersonal conflict from complexes, comparisons and conflicts between mahouts and the owner.

Mahouts have their own hierarchy. The first mahout usually directs and commands the second, who actually executes those commands and is in direct contact with the elephant.

The first mahout usually sits atop the elephant while the second walks beside it. The third one procures food. The second mahout may be more at risk with backlashes from the elephant, as it is he who the elephant associates with pain or command. However, a study on deaths of mahouts by elephants revealed that there is no significant difference in the number of first or second mahouts killed by the elephants.

Conclusions

Discussions in an environment such as this workshop can enrich knowledge and sensitise people towards the welfare of captive elephants. As mentioned earlier, the recommendations presented above are based on the discussions that came forth in the workshop. Only the topics that were related and exchanged are presented here. This does not suggest that other topics are less important. The workshop was able to identify and discuss many aspects of elephants' ecological or biological needs. In the veterinary field, a lot more information could be derived from the parameters and the talks presented at the workshop.

Unfortunately, we have not been able to suggest a mechanism for the funds required for elephant management. Even the aspect of elephant training has not been touched upon. This is due to the fact that there were none or only a few parameters identified for funds and other aspects. Future subject-oriented workshops should concentrate on other aspects as well. They should also focus more on 'mahout welfare' from the management point of view. In addition, along with scientists, welfare personnel, veterinarians, managers/ owners, the voice of the owner/management should also be substantially represented.

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Section 2: Presentations by experts

Captive elephant management—the way forward

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Abstract

Approximately 25% of the Asian elephant population lives in captivity. India has a large number of captive elephants. Captive elephants have served us in various ways and we have a moral obligation to manage our captive populations in an ethical and humane manner. Establishing a vision supported by a clear and practical national policy on captive elephants is very important for India. The vision and policy need to identify current uses, justification for such use, implications of such uses both for the concerned elephants and wild elephants, take into account the ability to manage them in a humane and ethical manner and assess the long-term implications of such captivity and use. The national policy should ensure that the strategy develops a standardised high-quality management protocol for all captive elephants. The protocol needs to address the nutrition, healthcare, spatial and social needs of captive elephants. It should also address the people's component (management staff and mahouts) so that people with the required capacity and skills needed for handling and managing captive elephant establishments are effectively in charge. Issues such as registration and micro-chipping need to be completed and monitored. The enforcement mechanism should be effective to ensure that all management regulations are enforced. Ultimately, we need to recognise that we have a moral responsibility and obligation to manage our captive elephants in an ethical manner and that should be uppermost in our minds when addressing issues dealing with captive elephants.

Introduction

Captive elephants have been used by man for over four thousand years, and still continue to be in use. Approximately 25% of the Asian elephant population lives in captivity. India has a large number (3400, Asian Elephant Range States Meeting-AsERSM - Report) of captive elephants. There are a number of reasons for us to focus on captive elephants. The demand for captive elephants could adversely affect wild population through illegal capture. Captive elephants can also contribute to the illegal trade in elephant products like hair and ivory. They have also been considered as being beneficial for conservation by facilitating research, like defecation rate studies, which may not have been possible or very difficult in the wild. While the success of some other research aspects too has been attributed to studies on captive elephants, these could also have been achieved in the wild by putting in more effort. We need to be cautious about assuming that research based on captive elephant is critically important or very essential for conservation. Elephants have also been used for work for thousands of years but their roles have changed over the centuries. Their primary use as beasts of burden still continues today. However, this use is rapidly declining due to increasing mechanisation and access roads being opened up to most human settlements. Their role in ceremonial events has remained intact to an extent but the actual necessity or continuation of this role needs to be critically reviewed as other historical functions or uses (use as war elephants, for staging elephant fights, use as executioners of condemned criminals or use by royalty in parades) have all ceased over time.

Elephants as display animals in zoos and circuses or other captive facilities have been seen as contributing to conservation by increasing awareness. While this may be true of some zoos and a few captive facilities, their role in circuses remains highly

questionable. We also need to recognise that only zoos and facilities that leverage elephants for conservation serve this function. Zoos and captive facilities that just display elephants without actually leveraging their presence to support conservation and where awareness generated is incidental, actually do not serve this purpose in any significant way. Their use in other activities like patrolling within forests or for use in human–elephant conflict (HEC) work has strong and direct links to conservation. But here too there is a need for careful assessment so as to ensure that the need for elephant is not actually being created by the existence of captive elephants. Even where surplus captive elephants exist and where there is a need to find activities for the productive use of such elephants, that use should be time bound and not result in the creation of a demand for elephants. Ex-situ conservation and restocking of habitats where elephant populations have been depleted or extirpated have also been suggested as potential uses for captive elephants. Currently, there is no dedicated ex-situ conservation facility for elephants and as such all elephants currently in captivity do not fit this category. However, the idea of restocking habitats where populations have been depleted or extirpated has limited applicability in most Asian countries and also needs to be reviewed in the context of genetic uniqueness of local populations, potential for disease transmission to wild populations and HEC. Ultimately there is a clear need to reassess the need for captive elephants for various tasks, reassess the justification of these tasks themselves and a need to move away from finding generalised reasons or excuses for continued use of elephants in captivity.

While we need to critically review and question the need for having elephants in captivity and the uses we put them to, we also need to deal with the large existing captive population we have inherited. This population is likely to be around for another 40–50 years before it dies out (even if we allow no breeding or new captures). Therefore, we have an ethical and moral responsibility to address this existing captive population so that they are managed in a humane and ethical manner as long as they remain alive in captivity. To this end, we need to develop clear policies and management standards, and ensure effective monitoring and enforcement of such standards.

Trends in captive elephants

The trend observed indicates that captive elephant populations are increasing in some areas while they are decreasing in others. This clearly shows that some people are giving up using elephants while others are increasing their use. What is important is where and why these increases are taking place and are they really and ethically justifiable? Areas with increasing or declining trends both bring in problems of their own. In areas with declining populations there is less demand or work for elephants and this can result in increasing neglect and poor maintenance of captive elephants. In areas where there is an increasing demand for captive elephants, the influx creates a shortage of management and maintenance skills, resources and facilities (absent in new owners and overstretched with existing owners), and thus results in poor maintenance. Hence, both situations are likely to create problems for ensuring ethical and humane management of captive elephants. Management has to address both these situations and further there is the need to objectively assess if there is indeed a justifiable need for more captive populations in areas where demand is increasing. If there is genuine and justifiable need then it is critical that the time scale over which these elephants are really essential needs to be established and adhered to.

The purpose of keeping elephants in captivity varies from country to country e.g. Bhutan, which has only five elephants, has officially stated at the AsERSM (Range States meeting in Malaysia) that they do not want captive elephants while some other countries stated that they see a decreasing need for captive elephant. But a few countries indicated that they may need more captive elephants. Irrespective of the trend, individual

countries need to develop effective and practical strategies that allow them to address the issues related to captive elephants in a holistic manner. India has a large number of elephants in captivity and needs to have a clear national policy that establishes a clear vision or goal and develops a comprehensive strategy for managing captive elephant in a humane and ethical manner.

As captive elephants are likely to be around for a while it is very important that we monitor our captive populations so that illegal captures do not deplete wild populations. Micro-chipping and regular monitoring along with regular and effective law enforcement will help address this issue. All Range State countries have expressed their willingness to enforce micro-chipping and monitoring of captive elephants.

Strategies for elephants in captivity

The national policy should be based on addressing the very fundamental question—what is the purpose of keeping elephants in captivity? And the answer needs to be clearly justifiable along with the time scale over which that justification is valid or applicable. Use of elephants for cultural or religious purposes, for eco-tourism and related activities, display/recreation, forestry operations or HEC mitigation activities, transport, etc. need to be reviewed based on clearly justifiable requirements, their impact on the concerned elephants, their implications for the ethical and humane management of the elephants, their implications for the long-term use of captive elephants and lastly their implications for wild populations. In any assessment we must bear in mind that many earlier uses have been discarded either due to mechanisation replacing the roles played by elephants or more importantly because we as humans evolved greater social consciousness. Over the centuries and especially so in the last century we have discarded many practices and customs that were once considered to be traditional, cultural or religious in nature because of their incompatibility with our growing social consciousness. Even our use of elephants has changed because of this change in our social development (extreme examples would be the use of elephants to execute criminals or use in elephant fights). When developing a vision for captive elephants we need to look beyond today's standards or justifications for use and work towards standards that are more in tune with tomorrow's standards.

Developing a vision, policy and strategy for elephants in captivity would require a comprehensive and objective assessment of their actual need and the justification for it.

1. Is there a genuine or justifiable need for captive elephants?—This exercise has to be carried out for each of the categories where elephants are being used (e.g., ceremonial use, eco-tourism, HEC, display in circuses, display in zoos, etc.)
 - a. What is the number of elephants presently used in a specific category (e.g. ceremonial/religious use, forestry/HEC work, tourism, etc.)?
 - b. Is the activity justified in the real sense? We must bear in mind that humans have evolved socially and have given up many past practices that are considered inhumane, discriminatory, non-productive or of inferior technology, etc. as such the justification needs to be valid and not just a statement
 - c. If the answer is 'YES' to the need for captive elephants, then
 - i. We need to define the time scale over which that need will persist. This can be a coarse assessment stating that the need could be over the short term (5–10 years) or medium term (10–50 years) or approximately the life span of an elephant) or long term (>50 years)
 - ii. We then need to develop clear policy and strategy to manage captive elephants over the required period of time, having a clear end plan if necessary. The strategy or plan would have to be adaptive so that policy changes can be implemented as and when required. This would include a clearly defined

- need with justification and a timeframe over which it is applicable with a well-defined end point (or plan) where needed
 - iii. Developing practical and ethical management standards
 - iv. Developing a monitoring and enforcement mechanism to apply those standards effectively
- 2. If there is a short or medium term need for elephants then we need to address two main issues
 - a. Does the existing population of captive elephants suffice to address this short/medium term need? If not, can redeployment of captive elephants from other redundant tasks allow us to meet the needs? If not, how is this additional demand to be met? The options are captive breeding, capture of problem elephants from the wild or to procure elephants from a country that has a surplus. And once the demand is met we need to answer how well the added population fits into the timeframe we have set for this usage
 - b. The next point that needs to be addressed is what to do with any remaining captive elephants at the end of the predefined period of use (or need)
 - i. They can be redeployed in other tasks if there are any
 - ii. The usage has a timeframe whose end point coincides with the time when the existing captive population dies off
 - iii. They can be transferred to any other country that has a justifiable need and when legally feasible
 - iv. They can be maintained at a holding facility till they die off (managed extinction)
 - v. They can be reintroduced to the wild if feasible, desirable and possible
 - vi. Any other option that can be thought of
- 3. If there is a long-term need for captive elephants i.e. no foreseeable end point or at least an end point that extends beyond the life span of the current captive population. Then the options are very similar to those in short- and medium-term usage but with a clear need for sustaining the captive population numbers. Captive breeding, capture and use of problem elephants, sourcing from countries that have a surplus and where it is legally feasible to do so, etc. could be options for addressing long-term needs if additional animals are needed to supplement or sustain the existing captive population
 - a. A systematic and periodic assessment of the need for continued use of captive elephants is extremely important to ensure we do not persist with a use only because it was deemed as being essential at some point in the past

Standardisation of management quality

Ethical and humane management of elephants in captivity needs to be the most important component of any policy and strategy. Clear standards for ethical and humane management of captive elephants need to be developed. These standards need to be applied uniformly to all captive elephants engaged in any activity. The ability to monitor and enforce these standards is a must and central to any policy or strategy.

1. Ethical and humane management standards for captive elephants need to be established for the following (below). These points (below) are just pointers and not a comprehensive list and do not cover all aspects. A more detailed listing of issues and the aspects that need to be addressed in thorough manner while taking into account that variable situations can exist
 - a. Training: best practices should be established—while no trainers claim that their method of training is inhumane, the reality is that most methods are -

inhumane to some degree. As such there is a need to look at training in a more objective and critical manner so as to develop the most humane approach, while ensuring through regulation and monitoring that these methods are adhered to at all training facilities. The mindset of revering and accepting ‘traditional methods’ needs to be discarded when it is inhumane

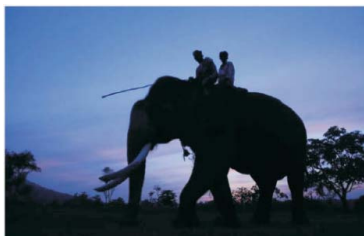
- b. Diet: Food can vary with the area and availability of food sources, but it needs to be adequate and of good quality. A diet that has variety and quality is a must. Free access to good quality drinking water is essential
 - c. Veterinary care: A dedicated veterinary doctor should be available for all captive facilities that have a large number of elephants. Where such dedicated veterinarians are not available, it is important that the local veterinary doctors (government animal husbandry department or private) should be given basic training in elephant healthcare and management so that they can address routine healthcare needs and also any other small emergencies
 - d. Physical environment: The physical environment can vary but all situations must maintain some minimum standards. Elephants should not be tied to a single spot for extended periods of time and should be allowed as much free movement possible when not working
 - In case of free ranging, captive elephants (and in forests with wild elephants), disease transmission from captive elephants to wild elephants is a serious issue and has to be monitored and managed to avoid transmission. Moving elephants (zoos, temples, etc.) with the potential to transmit disease to wild population to such facilities should be avoided or done only when proper screening is possible
 - e. Work environment: This should ensure that elephants are not tied to a single spot (as in temples) for extended periods without free movement; they should not be used in dangerous areas or for dangerous work; they should not be used in stressful environments (large crowds, noisy areas) where they need to be constantly kept in tight control for extended periods of time, etc.
 - f. Social environment: The social environment of captive elephants should encompass a minimum number of individuals per institution or captive facility and allow for regular physical interaction between animals.
2. An integral part of ethical and humane management of elephants also requires us to address the elephant mahouts and managers who ultimately interact with captive elephants on a daily or regular basis and are responsible for the actual management or treatment of elephants. We need to classify these people into two categories namely the managers who are responsible for the captive elephant establishment and the mahouts (and their assistants) who actually handle the elephants.
- a. Managers
 - i. Capacity (knowledge and skill) to deal with and manage the captive elephant establishment
 - ii. They need to have a clear understanding of why the elephants are being kept in captivity and a clear understanding of the need to manage them in a humane and ethical manner
 - iii. Ideally they need to spend extended periods of time with the establishment as routine training is not an easy option nor is finding people committed to such work
 - b. Mahouts and their assistants (investment in selecting, training and maintaining good staff is very important)
 - i. A mahout’s knowledge, skill and his compatibility with elephants is very

important to good management and handling of elephants. So selection and training of a mahout becomes an integral part of the overall captive elephant management strategy

- ii. Long-term association with elephants is very important—changing of mahouts can be stressful to the animal as it establishes bonds with the mahouts. So people who come in for short stints are not suitable no matter how concerned they are about elephants
- iii. Ability to stay and work in the captive elephants' facility—often city living people whose aspirations and interests lie elsewhere do not make good mahouts. Tribals who live in forests and have no such distractions make better mahouts. But each captive elephant establishment is different and the best option needs to be selected
- iv. Given this need for commitment, risks and intensity of the work, it is essential that mahouts are well paid and their basic needs are met so that there is job satisfaction and they are not dissatisfied as that would affect their work
- v. In general, institutionalisation of maintenance and management protocols for all categories of elephant and mahout management is needed

Conclusion

Although the ethical use of elephants and managing them in a humane manner is a contentious issue, it is our moral and professional duty to address this important issue in a responsible manner. Long-term management of captive elephants in a humane and ethical manner has not been addressed in a serious, systematic and structured manner. Our current management policy and practice have been without any clear or practical goals. By



avoiding addressing this subject in a meaningful and practical manner we have allowed management of certain captive populations to deteriorate to unacceptable standards. To rectify such unacceptable management scenarios we need to urgently address all the issues in a comprehensive manner so as to develop a clear and practical national policy that brings in the best management practices and standards. The policy also has to be backed by a clear long-term vision or goal for captive elephants including addressing fundamental issues like—do we actually need to keep elephants in captivity in the long term? Other issues like registration and micro-chipping are essential and important to stop illegal captures from the wild. A monitoring and enforcement mechanism is essential and should be applied effectively so as to ensure that captive elephants are managed in a humane manner and there are no illegal captures from the wild.

Biographical sketch

Ajay Desai is a wildlife biologist who has specialised in the study and conservation of



Asian elephants. His studies and work have spanned the various aspects of elephant behaviour, ecology and conservation over the past 25 years. In addition to his work in India he has worked as an elephant management consultant in various countries like Sri Lanka, Cambodia, Indonesia and Lao People's Democratic Republic. He currently works as a consultant to various projects run by Bombay Natural History Society (BNHS) and World Wide Fund for Nature (WWF)-India in the Western Ghats. He is the co-chair of the IUCN/SSC Asian Elephant Specialist Group and a member of the Steering Committee of Project Elephant (Government of India).

Role of rescue/rehabilitation/care (RRC) centres for captive elephants in Kerala

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Abstract

Kerala has a rich heritage and a wealth of experience in captive elephant keeping. However, the quality of life of elephants has been deteriorating in recent years due to lack of sufficient nutrition, timely medical care, shortage of water, fodder, trained mahouts and knowledgeable owners. However, wellwishers have started expressing concern over the recent trends in elephant care and handling. Sustaining economically unviable elephants, caring for terminally ill and aged ones, rehabilitating rogue elephants, addressing increasing violence among elephants are some of the prime issues that need to be resolved. This can be achieved by establishing or developing a vision for elephant welfare and management and particularly defining the role of rescue/rehabilitation and care (RRC) centres for captive elephants.

The attitudes of the various stakeholders and elephant welfarists also play a significant role in determining the status quo. In places like Kerala where elephant keeping is a matter of pride and prestige, a majority of owners do not seek external help, particularly from NGOs. Also, the concept of welfare is limited to physical well being and the only external aid sought would be in the form of medical treatment through veterinarians. Therefore, the most challenging step would be the procurement of such abused elephants that need care and rehabilitation. This can be achieved through confiscation, goodwill, social pressure or owners' voluntary approach. Visions for RRC and experiences of keeping a tusker in Elephant Care Centre (ECC) are presented here.

Elephant rehabilitation/rescue may have two approaches: in-situ—rescue while it is still in the mainstream with mahout and owner, and ex-situ—separating elephant from the mainstream including isolation from its mahout and owner. Rescue or rehabilitation at care centres involve three phases: (a) identifying abused or sick elephants, (b) procuring these elephants, and (c) the actual process of keeping/caring for them. All captive elephants need some level of welfare. Broad classification levels of welfare then enable us to prioritise and organise rehabilitation efforts.

Introduction

Elephants have been an integral part of Kerala's history and culture for centuries. Despite this rich heritage and wealth of experience, the quality of life of elephants has been deteriorating in the recent years. Many of the privately owned elephants being past their prime working age are overworked, and in the absence of sufficient nutrition and medical care, their physical condition has deteriorated severely. Mishandling and neglect by untrained mahouts has also led to increased abuse of the elephant, resulting in physical mutilation and even mortality. On one hand, Kerala has the best management practices, skilled veterinarians and a very enthusiastic public. On the other hand, the plight of elephants is pitiable. The elephant owners and the mahout community are both victims as well as the culprits of the poor management environment prevailing in Kerala. Due to financial or technical constraints, some owners or mahouts maintain the elephants poorly. They are conscious of the situation and are open to accepting economic aid or technical counsel.

The high economic returns combined with the artificially promoted and evolved socio/

cultural/religious factors has resulted in a very strong interest in sustaining elephants in captivity for the festival culture in particular. All stakeholders, primary (owners, mahouts and elephant traders), secondary (festival brokers, elephant accessory makers, and elephant riders) and tertiary (temple committees and elephant fans) have a vested interest in sustaining the elephant culture for economic/socio/religious/cultural reasons. Since elephant ownership is associated with social status and class, some owners have a sense of false pride, which prevents them from seeking, or accepting help from rehabilitation/care/rescue centres. Similarly, mahouts may not like to work in an RRC facility forsaking the economic benefits derived during festivals and other challenging or thrilling activities in comparison to regular elephant care and rehabilitation work.

The keen economic and commercial interest has been detrimental to the welfare and conservation of elephants in Kerala. However, there are still a few owners and mahouts who are concerned about the captive elephant's situation and can prove to be excellent elephant managers and resource persons. A large section of the general public and the media have also been voicing their concern over the recent trends in elephant care and handling. There are differences of opinion on elephant welfare among the various agencies, (NGO/NGIs, Government, veterinarians and general public) leading to conflict. Other equally significant issues that need to be comprehensively addressed to find sustainable solutions to the management problems of captive elephants are:

1. Economics of maintaining captive elephants
2. Mental and physical health of captive elephants
3. Working environment of mahouts
4. Depleting fodder sources
5. Attitude of elephant managers and the public

There is a general fear among the community of elephant managers that Kerala is heading to resource crisis in terms of fodder and mahouts. Sustaining economically unviable elephants, caring for terminally ill and aged elephants whose 'productivity' cannot be restored, rehabilitating rogue elephants, addressing increasing violence in elephants, are additional issues that need to be resolved.

Approaches to Kerala's elephant issues

Kerala's elephant issues and problems are multidimensional. It is impossible for an individual agency such as the State Forest Department, an NGO or the veterinary community to address all the issues simultaneously. Therefore, a coordinated attempt should be made between NGOs, State Forest Department, veterinarians and media to define roles and address the issues in a coordinated fashion.

A. The in-situ approach

In-situ approach would constitute rehabilitation or welfare measures adopted when the elephant is in the mainstream elephant culture circuit while being associated with various stakeholders. Regular healthcare services for elephants, technical counsel for various management issues, action research on various aspects associated with elephant nutrition and other parameters, conducting workshops and programmes on elephant-mahout welfare, discussions involving stakeholders, conducting training programmes for mahouts/owners, awareness programmes for the general public, etc. are some of the activities that can be implemented.

In extreme cases, legal action could also be taken.

B. The ex-situ approach

Often elephants may need to be permanently/temporarily isolated from the mainstream for a variety of reasons (poor health, age, temperament, etc.) and need to be provided with special care at rescue/rehabilitation/care centres (RRCs). This would constitute the ex-situ approach.

Vision for rescue/rehabilitation/care (RRC) centres

Since Kerala has several unique socio-religious, cultural and economical peculiarities in association with captive elephants, a rescue/rehabilitation centre may have a different definition and role in the current context.

Primarily, it is essential to establish within the minds of the stakeholders that welfare constitutes not just physical well-being but psychological and biological well-being also.

RRC centres can demonstrate to the elephant owner/lover community the emotional, economic and aesthetic value of restoring the physical and behavioural health of sick elephants. The objective of the centres should not be to increase the number of elephants within the facility but to develop an optimal elephant care model and subsequently encourage other owners to simulate similar conditions within their own property.

Ideally, once a standard for optimal care is established, and the elephant stakeholders realise the significance of such a condition, the in- and ex-situ approaches must function in a cyclical manner and the need for RRC centres should gradually cease. But as long as there are captive elephants, there will always be varying degrees of abuse and need for external intervention.

Keeping the above vision in mind, RRCs could carry out the following functions:

1. To treat and shelter captive elephants that are temporarily indisposed both physically and psychologically
2. To demonstrate to the elephant owner/lover community the emotional, economic and aesthetic value of restoring the physical and behavioural health of sick elephants
3. To adopt and shelter elephants that cease to be economically viable and have turned into a liability for the owner due to old age and/or terminal illnesses
4. To explore the feasibility/viability of involving less productive elephants in tourism as an avenue of income generation for their maintenance
5. To develop realistic, elephant-friendly and cost-effective models of elephant care which can be replicated by owners, both individually and in groups
6. To provide technical counsel on optimal elephant care

Challenges in establishing RRC centres

Identifying elephants

As mentioned earlier, there are 800–1000 elephants in Kerala requiring rehabilitation and care in various capacities. Therefore, it is essential to classify and prioritise which elephants need to be admitted into the centre. It is also essential to identify if the elephants need temporary or permanent care.

Procuring elephants

The available options for procuring elephants are legal confiscation of the animal, through goodwill of the owner, social or public pressure that forces an owner to send an elephant to RRCs, and ultimately voluntary submission by owners. Currently, NGOs in Kerala have no other option but to purchase elephants for RRCs, which is a highly unrealistic proposition, considering the costs of elephants, which range from Rs 7 to 12 lakhs.

Care of the elephants

Kerala does not have any regional working model as far as RRCs are concerned; however, it is possible to improvise from the already available international models. The greatest challenge in running an RRC centre is its financial sustainability which may be ensured by economical self-reliance without compromising the basic welfare objectives of such a centre. Though a Herculean task, there is a potential

for eco-tourism in raising revenues for captive elephant rehabilitation. However, it is yet uncertain to what extent the eco-tourism models can help in sustaining the RRC centres.

The funds generated by elephant culture are enormous and if managed properly can make captive elephant keeping sustainable. The RRC centre therefore, while associating with elephant tourism in Kerala should focus on developing tourism as an avenue for sustaining elephants which have become unviable for festivals due to temperament, age, health, etc. Its objective however should not be to attempt to replace the festival industry with a tourism industry.

Implementation

Having established the problems and approaches that could be adopted, it is important to identify the implementing agency. As mentioned earlier, efforts need to be holistic and coordinated, and the roles of stakeholders and welfare groups need to be defined. Challenges encountered while running an elephant rehabilitation centre between April and May 2005 included an attempt to rehabilitate a captive elephant (Karnan-tusker, approx 32 yrs) made in ECC with the following objectives:

1. To understand the technical and philosophical challenges associated with captive elephant care and rehabilitation
2. To demonstrate to the stakeholders associated with captive elephant management (such as owner, mahout, veterinarian, physician, general public, etc.) the emotional, economic and aesthetic value of restoring the physical and behavioural health of sick elephants
3. To explore the feasibility/viability of involving less-productive elephants (those that cease to be economically viable and have turned into a liability to the owner due to old age and/or temperament or terminal illnesses) in tourism as an avenue of income generation for their maintenance
4. To experiment with low-cost food alternatives based on locally replenishable food resources

It is hoped that a realistic, elephant-friendly economically sustainable model for elephant care could be developed, which could then be replicated by owners individually or in groups within Kerala.

Profile of the animal attempted for rehabilitation

The male elephant Karnan, adopted for the project, belonged to a private temple in Trichur District of Kerala. He had a congenitally defective dental condition, not being able to chew fodder sufficiently and thus making him a very slow feeder. He had also sustained minor wounds on his soles and elbows. His forelegs were deformed. He was an economic liability for the temple authorities and was temporarily taken to ECC for care for five months (May–September 2005) with the condition that the elephant's maintenance and upkeep would be met by ECC for that period and thereafter returned to the owner.

Achievement

Within 3 months of stay with ECC, Karnan's diet had improved from eating 8–10 palm branches to 18–20 a day, his water intake increased from 30 to 90–100 l/day and the elephant gained a weight of 59 kg. Karnan was certified by EEC's consultant doctors for his improved health and mental state. His dental condition however had not changed, as it was essential for his molars to fall off naturally in order to completely recover his feeding practices and gain good health.

Conclusion

Having put Karnan on the road to recovery, ECC had to entrust him to his owners with recommendations to continue his care while in their hands. This exercise has taught several lessons which formed the basis for this article. It primarily changed the entire philosophy and approach towards elephant welfare issues with reference to Kerala's captive elephant situation. It has also helped ECC to look at the concept of RRCs in Kerala from a fresh perspective.

Biographical sketch



Nibha Namboodiri is a post-graduate in Zoology. She received training as a mahout in Kerala, southern India, between 1995 and 1997. Since then she has been associated in an independent capacity with various captive elephant welfare activities such as mahout welfare, elephant rehabilitation and education within Kerala. Currently, she is the secretary of Elephant Care Centre, an NGO established for elephant welfare.

Tamil Nadu forest elephant camps? population status and management

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Abstract

The Tamil Nadu Forest Department has been capturing and maintaining elephants for about 150 years. The captured elephants are used for jungle patrolling, weed control, eco tourism, '*kunki*' operation, conservation education and training (*kunkis*, veterinarians and mahouts across the country). The camp facilitates research on elephants and acts as a breeding centre. A total of 224 calves has been born in the camp over a period of 120 years between 1888 and 2008. Currently, the camp has 70% male and 30% female elephants. There are only a few breeding females, about 8.6% of the total population, as the female calves have been sold to temples or to other agencies. For those elephants poorly managed in temples, circuses and other sources, the forest camps act as a rescue centre. The abused elephants however could be a source of infection for the camp and wild elephants. The present system of management reflects a mixed legacy of traditional and colonial influences. This continues to evolve with present-day modern practices. Domesticated elephants are facing ever more new problems: unsuitable employment, inadequate veterinary care, poor nutrition, poor social environments and, perhaps most worrying; deteriorating standards of care. The state forest department owns 14% of India's captive elephant population. These elephants are the critical resources to conserve elephants in captivity for the future. Most Forest Department operations are strapped for resources to offer significant physical outreach to privately owned elephants, but their knowledge remains invaluable.

Introduction

Elephant husbandry and its associated culture have a long history in India. India has a fascinating history of capturing and domesticating wild elephants. Tamil Nadu Forest Department, formerly known as Madras Presidency, has been capturing and maintaining elephants for about 150 years. The departmental use of elephant power was first mooted by the British in 1856–57 in Madras Presidency. Several camps existed in Tamil Nadu prior to state reorganisation but at present only two camps exist. Mudumalai elephant camp was first started in 1910, and the one in Topslip was established in 1956. In the recent past, the tradition of keeping domesticated elephants has waned (Bist, 2002). Many dimensions of traditional knowledge have been lost due to indifference and lack of care. The husbandry practices of traditional knowledge are still reflected in the present-day management, of course with a modern outlook. Domesticated elephants are facing many new problems—improper employment, inadequate veterinary care, poor nutrition, poor social environment, and, deteriorating standards of care (Lair, 1997). All the domesticated elephants in India do not get as adequate veterinary care as those elephants owned by the zoos and the state forest departments (Bist, 2002). The survey by Project Elephant in 2000 reveals that over 75% of the elephants are owned by private individuals.

The purpose of this write-up is to discuss the salient features of the management of elephants in forest camps. This also primarily focuses on the status of breeding of captive elephants in forest camps, its influence of welfare and conservation of the species.

The State Forest Department owns 14% of India's captive elephant population. These are the critical resources to conserve elephants in captivity in future. The practices of elephant husbandry in south Indian forest elephant camps appear to be model practices for others keeping elephants in captivity. Unfortunately, most forest department operations are too strapped for resources to offer significant physical outreach to privately owned elephants, but their knowledge remains invaluable (Lair, 1997).

Purpose of keeping elephant

Although forest elephant camps were originally started for timber logging operations, now they serve as conservation centres for rare and endangered species like elephants. Capturing of elephants from the wild is now banned; occasionally, however, rogue elephants are allowed to be captured with the approval of the Chief Wildlife Warden of the State as per the enactment of Wildlife (Protection) Act, 1972. The elephants are used for patrolling the forest areas to prevent ivory poaching and to clear obnoxious weeds like lantana which encroach elephant foraging ground. In addition to eco-tourism activities like giving rides to the visitors, they are also used to educate students, tourists, forest field staff, veterinarians, elephant managers and mahouts.

Visitors who visit the camp develop compassion and carry the message of conservation by seeing the camp activities and large number of magnificent tuskers and female elephants. A well-trained *kunki* elephant is used for driving, capture and translocation operation. This kind of operation saves the elephants not only from retaliatory killing by the public but also people being killed and property being damaged by rogue elephants. This will bring about people's participation and improve conservation awareness.

It also provides opportunity to conduct a scientific study which is otherwise not possible with wild elephants. In turn, scientific facts can be used to manage the elephant reserve. The forest elephant camp also acts as a rescue centre for wild orphan calves and elephants abused by temples and zoos. The elephants are maintained as mixed herds, and are able to socialise among themselves and with the wild, and act as a breeding centre. Since the forest elephant camp has been located in the reserve, both sexes can socialise with wild opponents when they are left out for foraging; thus this captive population acts as a 'gene pool'. India's domesticated elephants are valuable not only for the work they perform, but also as a future conservation tool against inbreeding or genetic drift in wild elephants.

Elephant in the wild, particularly adult male ratio is skewed due to selective poaching of bulls for their tusks (Lair, 1997).

Duties and responsibilities of staff

The camp is under the control of Forest Range Officer who is directly under the control of Field Director-cum-Conservator of Forests. The Forester is directly responsible for the management of the camp, progress of work and procurement of rations and maintenance of accounts. He lives within the camp. He has personnel at his command and will organise first aid for elephants and personnel. The Forester will be assisted by a Forest guard and a Forest watcher. The basic personnel unit attached to each elephant consists of a mahout and his assistant called cawadi.

A mahout is assigned only to those elephants which reach a height of 6 ft and above; until then it will be managed only by a cawadi. Elephants are retired at the age of 58 years. The retired or pensioner elephant is managed only by one mahout. A forest veterinary unit is attached with a post of residential forest veterinarian, a forest livestock inspector and two forest livestock assistants. The forest veterinarian is responsible for timely arrangement of resources available around the camp site, prescription of workload

and rest, formulation of healthcare services, periodical shifting of camp site based on fodder diet schedule, issue of periodical instructions and deciding other husbandry activities like weaning, training, etc.

Daily routine

Elephant is given cooked food twice a day once at 9:00 am and again at 6:00 pm. After evening food, the elephants, except for an occasional unpredictable dominant tusker, are let into the jungle for night grazing. The next day work begins with ringing of camp bell at 6:00 am and mahouts go into the forest to fetch their respective wards. After a scrub bath in the river, elephants assemble at their respective places in the timber railing which is placed around the feeding centre. This will facilitate inspection by the Forester and veterinary personnel to examine their health and assess behavioral aspects. Dekamil oil (containing neem oil, garlic and camphor) is smeared, before feeding, over the cuticle, tusk commissure and genital opening as antiseptic fly repellent and as a foot care measure. Then the elephant is taken to work or grazing sites. The evening bathing (Figure 1) begins at 3:00 pm and the feeding is at 6:00 pm after the application of dekamil oil.

Diet, ration and body condition

Rations are issued to each elephant as per the diet schedule formulated by the camp veterinary officer. The amount of cooked ration (Figure 2) is calculated based on body size, age, workload, reproductive state and physiological and pathological conditions like musth, malnutrition, chronic disease, molar deformation and other metabolic diseases. Forest veterinarians inspect the food material periodically to ensure quality and quantity. Growing and lactating animals receive a liberal measure of cooked ration with special food like coconut and jaggery (sugarcane molasses) along with mineral and vitamin supplements. A rundown condition from overwork can usually be rectified with a minimum of 15 days' rest and ad-libitum grazing with specific medicinal supplements.

The selection of grain material is based on easy availability and cost. At present, ragi (*Eleusine coracana*) and horsegram (*Macrotyloma uniflorum*) are liked by the animals, they can be stored for long periods and are widely available throughout the year. The ration is boiled in water in a large cauldron until it reaches the consistency of a thick pudding. The cooled material is padded into wooden forms to set and cool, and before dark is rolled into balls and hand-fed to the elephants by the mahouts. The following rough guidelines are followed to formulate rations.



Figure: 1. Bathing as part of daily routine.



Figure: 2. Cooked ration ready for feeding.

Table 1: Rough guidelines to formulate diet schedule for the captive elephants kept in Tamil Nadu Forest Camp

Age/Sex	Horse-gram (kg)	Ragi (kg)	Salt (g)	Jaggery (g)	Mineral mixture (g)
1–6 years	1	4	100	100	100
6–15 years	1	8	100	100	100
Male Rest	3	14	100	100	100
>15 years Work	5	18	150	100	100
Female Rest	2	12	100	100	100
>15 years Work	4	16	150	100	100

Workload, quantum of work and working hours

Elephants are primarily used for elephant safari, jungle patrolling, lantana weed clearance, *kunki* operation and forest work. Selection of elephants for specific work and rest is at the discretion of the forest veterinarian. In order to maintain the health of elephants from overwork the following seasonal working hours are being followed.

- Joy rides
 - Morning: 7:30–8:30 am
 - Evening: 4:30–5:30 pm
- Lantana weed clearing and patrolling
 - Winter and monsoon
 - Morning: 8–11 am
 - Evening: 2–5 pm
 - Dry season
 - Morning: 7–10 am
 - Evening: 3–6 pm

The elephants are unbeatable to drag and carry weight on their tusks, but an adult elephant cannot carry weights of more than 450 kg on its back because of its anatomical structure.

Record keeping

A Service Register (SR) is maintained for each individual animal from the time of acquisition to the time of disposal. This document is a complete record of important details about each animal and includes details of means of acquisition, training method, temperament, breeding performance, workload, cost of maintenance, veterinary treatment and mahouts and assistants who man the animals. The Livestock Register is an inventory which indicates the number of elephants by name, sex, age at the time of acquisition, method of acquisition, girth and height measurements, book value, diet and workload prescribed, cost of maintenance, work performance, and the nature of disposal. Other registers like Ration Distribution Register, Vaccination Register, De-Worming Register, Treatment Register, Biological Sample Laboratory Diagnostic Register are also maintained.

Healthcare and camp hygiene

A forest veterinary unit is attached to the elephant camp with a sanctioned post of Residential Forest Veterinarian. Other than regular daily skin and foot care, periodical healthcare measures like annual vaccination against contagious infectious diseases, screening of dung sample for parasitic ova, screening against tuberculosis,

assessment of blood and serological parameter once a year are also followed strictly. Health camps for mahouts are also organised to prevent zoo-anthropozoonotic diseases. Periodical health check-up, tusk trimming and special diet based on pathological and physiological condition are followed to maintain good health of the animals.

Periodical shifting of elephant campsites is followed after mass de-worming specially during drought periods to reduce parasitic load and to minimise habitat degradation. Dung piles in the tethering and bathing areas are cleared daily. Rodents, stray dogs and scrub cattle are controlled strictly to minimise infection to elephants. Other hygienic measures like cleanliness of utensils and food preparation table and washing of mahouts' hands with disinfectant soap before hand-feeding are the current practices to control coli-salmonella-like infection.

Elephant handling and training

Elephants are maintained as a free-ranging system of management. The use of tribal people (*Kurumbas*, *Kattunaikars* and, to a lesser extent *Irulas*) as elephant handlers clearly pre-dates the establishment of elephant camps by the British. The pregnant elephant works up to the 13th month of gestation and is given rest until the weaning of its calf. The calf is weaned away from its mother at the age of 1½ years and training is carried out within the *kraal* to reduce injury to the mahout as well as to the elephant. The animal is trained by positive reinforcement method by rewarding with sugarcane. One outstanding practice in this camp is that the mahout never uses an 'ankush' or any other sharp iron metal object. Only sticks are permitted to be used. Some of the tuskers are even handled during musth.

Status of reproduction—captive breeding

The elephants in the camps are maintained as a mixed group, and simulate the social structure of wild elephants in herds, i.e. consisting of different age and sex classes. Hence, they are able to socialise when they are in camp or when they are let out for foraging. As these camps are located within the forest area, the captive cow elephants have access to both captive and wild bulls with which they consort and become pregnant. A total number of 224 births have been recorded from 1888 to 2008 over a period of 120 years. Out of 224 calves, 111 were females and 115 males, giving a male–female ratio of 1.04:1. Observed age at first calving is 15 ± 2 years (Nisha 11 years and Tara 13 years) and age at last calving is 53 ± 2 (Tara 66 years) years. The calving interval is 5 (ranging 2.5–14 years) years (Krishnamurthy, 1995). The number of calves born to individuals varied from 3 to 12 (Figure 3) and a seasonality of birth of 72% during December–February (Krishnamurthy, 1995) was reported.

Currently the camp has no breeding females as elephants have been donated to temples or to other agencies. A one-man commission (Krishnamurthy Commission) was set up to assess the status of captive elephants in Tamil Nadu by the Tamil Nadu Forest Department in 2000–2002. The Commission advised against parting with female stock in the future. As a result in recent days, no female elephants have been sold or donated. Krishnamurthy (1995) reported that captive elephants such as those found in the forest logging camp are under good management regime and have better breeding performance than those in the zoo.

This source population is very important to maintain elephants in captivity for another two to three decades. Lair (1997) feels that if India wishes to preserve its domesticated elephant numbers at anywhere near the present levels, then now is the time to begin improving captive breeding to avoid a moribund population two or three decades in the future.

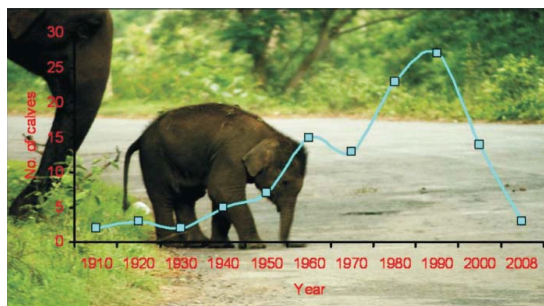


Figure: 3. Trend of calf birth over the years: Number of calves born is plotted against years (from 1902 to 2008).

Threats to forest camp elephant

Even though 111 female calves were born in the camp, at present there are only 30% females in captivity, with the rest being male (Figure 4). No new female has entered the calving list since 1986. The cow which started breeding prior to 1986 continues to breed even now. At present, breeding females constitute only 8.6%; most of the females are old and are non-breeding. This is the reason for considerable decline in the birth rate after 1990s. This is an alarming situation. Krishnamurthy and Wemmer (1995) report that the future of working timber elephants is under threat in India as it is for all captive elephants, because natality does not match mortality. Continuous breeding and new recruitment are essential to maintain elephants in captivity in future.

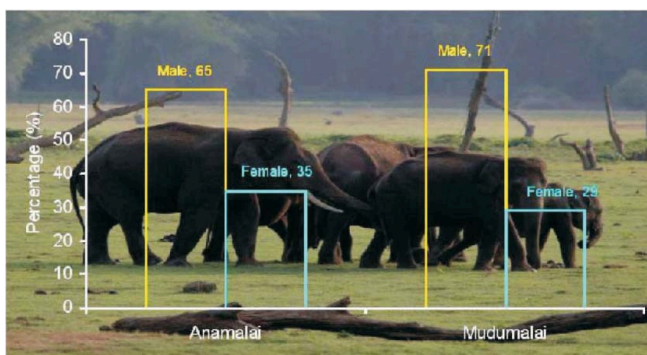


Figure 4: Current population status in Tamil Nadu forest camp.

The newly emerging fatal herpes virus disease is posing a great threat to the conservation of captive and wild elephants. This virus selectively affects young calves which are less than 7 years old. Incubation period is very short and until now no effective treatment regime has been found. Since 1998, about 60% calves (5 calves) died due to this deadly virus.

The camp plays an important role as a rescue centre for those elephants that are badly

maintained in temples, circuses and other sources. However, these abused elephants could be a source of possible infections like tuberculosis and other parasitic infection to the forest camp and wild elephants. Tuberculosis is zoo-anthropozoonotic disease; human form of TB spreads and affects both the mahout as well as the elephant. Diagnosis of TB and treatment are costly as well as a hard procedure to follow in the field situation.

Conclusion

Tamil Nadu has a long history of keeping elephants in captivity, and elephants in the Mudumalai Forest Camp have played a critical role in maintaining the viability of the captive elephant population in the state. Currently the camp has no breeding females as elephants have been donated or sold to temples or to other agencies. However, as per the commission which assessed the status of captive elephants in Tamil Nadu, in recent days, no female elephants have been donated or sold.

Temple elephants are more prone to the human type of tuberculosis as they come into close contact with people. If for any reason the affected animals are transferred to the forest camp the infection will spread to camp elephants as well as to the mahouts. The free-ranging forest camp elephants can spread this infection to those in the wild also as they have close contact. A separate rescue facility can be created to rescue and rehabilitate abused or sick elephants from temple or other sources.

Herpes virus has killed calves both in captivity and in wild. Proper disease monitoring and diagnostic facilities are needed after detailed research study. This will help to understand this problem to formulate control measures in the long run to the wild population as well.

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Biographical sketch

Dr. Kalaivanan has obtained B.VSc from Namakkal Veterinary College; Tamil Nadu. He works as a residential Forest Veterinary Surgeon at Mudumalai Elephant Camp since 2002. In 2006, he has attended a training program on Wild Animal Capture Techniques in Zimbabwe, organised by the Zimbabwe Wildlife Veterinarian Association. During 2005–2007, he was actively involved in health camps organised at Mudumalai Forest to private and temple elephants of Tamil Nadu. He was also involved in the Radio-collaring Programme of the Asian elephants in

Buxa Tiger Reserve as post-capture vital function monitoring specialist. He is actively involved in monitoring day-to-day camp activities, healthcare of elephants, training *kunkis* and other field personnel. He is interested in the healthcare of captive elephants, wildlife diseases, wildlife rescue and mitigation of human–elephant conflict.

Captive Elephants in Kerala: Welfare challenges

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Abstract

There are about 750 captive elephants in Kerala. A majority of them are males. Improper understanding of rules governing captive elephant keeping is a hurdle in welfare initiatives and implementation. There are hardly any dedicated NGOs for people's participation. 'Kerala Captive Elephants (Management and Maintenance) Rules 2003' was enacted in 2003, though efforts for it were initiated as early as 1997. The rules cover most aspects of management. Due to complexity of circumstances involving religion, tradition, employment factors, coordination among different governmental, non-governmental and environmental agencies, management is a challenge. Greater involvement of the Ministry of Forest and Environment, Project Elephant Directorate, State Government and State Forest and Wildlife Department is important to resolve issues pertaining to captive elephants and their mahouts. Registration of elephants with microchip is progressing steadily and satisfactorily. Value of captive elephants as a source of genetic material/gene pool and captive breeding needs to be defined and incorporated in future planning. Lifetime care centres are also important to nurse rescued calves and confiscated, old and injured elephants.

Introduction

There are about 750 captive elephants in Kerala. Majority of them are males and are kept in isolation. An elephant in captivity is a wild animal primarily captured for its bestiality to be used as a war machine and draught animal. It is neither mild nor sober. Its welfare concerns are many—reduced availability of feed and water, rise in ambient temperature due to climate change, lack of shelter and shade, heavy and long duration of work during seasons, especially the summer months, and illiteracy among mahouts and owners on the management of elephants. Lack of knowledge of rules concerning captive elephant-keeping by public, user groups, owners, mahouts, veterinarians and lower-level of forest officials is a hurdle in welfare initiatives and implementation. There is also a lack of awareness on rules such as the The Prevention of Cruelty to Animals Act, 1960 (PCA Act) and Performing Animals Act. Unfortunately, there are hardly any NGOs devoted to the cause of people's participation in animal welfare activities. There are no concepts of working that strike a balance between moral, public, physical and psychological concerns of elephant keeping. 'Kerala Captive Elephants (Management and Maintenance) Rules 2003' was enacted on February 26, 2003, though efforts for it were initiated as early as 1997.

The Rule covers most aspects of management with definitions, husbandry practices, mahout's parameters, things to do and not to do. However, enforcement is a challenge due to the complexity of circumstances involving religion, tradition, employment aspects and coordination among various governmental and non-governmental agencies. Greater involvement of the Ministry of Forest and Environment, Project Elephant Directorate, State Government, and State Forest and Wildlife Department, NGOs and scientific community is important to resolve issues concerning the captive elephant. Registration of elephants with microchip is progressing steadily and satisfactorily. The concept of micro-chipping elephants began in 2003 in India. However, there are

problems in initiating and completing this process in Kerala owing to many factors. There is necessity for a multidisciplinary approach to handle captive elephant welfare issues with focus on ownership, animal transfers, close monitoring of owners and elephants and welfare of mahouts. The 'Value of captive elephants' has not been defined; there is immense potential for enriching the wild population gene pool with the genes of the captive elephants, most of which are magnificent tuskers. Captive breeding and cryopreservation of the semen of good elephants have to be done at the earliest. Lifetime care centres for rescued calves, confiscated, old and injured elephants are important. These need to be defined and incorporated into future planning.

Welfare measures

The norms that were formed in the Rules cover most aspects of management with their definitions in detail? housing, feeding, work, transport, healthcare, mahouts (training and healthcare), trimming of tusks, retirement, cruelty, record-keeping, things to do and not to do and certification for experienced mahouts. However, enforcing penalties is always a complicated issue. Since elephants are Schedule I animals, no petty penalties can be imposed at present. This requires new enactment and needs to be considered seriously by the authorities. To penalise owners/mahouts/users who overwork their elephants, indulge in excessive beating, underfeeding, etc. is currently impractical. There is added confusion as to the identification of the guilty whether it be the owner, the mahout, the brokers or agents or the users, at certain times quasi-governmental agencies like temple authorities headed by high-ranking government officials. Due to the reduction in timber-related work in modern times, seasonal festivals and tourism have become major user groups. Though mahout and elephant remain together for a long time during festivals, there is minimal communication between them and elephants have negligible intellectual activity. This results in complete absence of mutual understanding, faith and trust between man and animal, which is integral for good welfare practices. Scientific methods need to be adopted for timely supply of quality food, must management and regulation of workload on the elephant. Regular monitoring, study, experimentation and implementation of appropriate norms are required for these.

The welfare and social security of mahouts are totally lacking leaving them and their families in complete penury in the event of loss of employment, accidents and litigations. Insurance for mahouts is essential since it is a very risky job. Since the mahouts are small in number and are scattered due to the nature of their work, they cannot unite as a work force. This makes them vulnerable and a politically insignificant and fragile group. Competent and educated individuals from better family backgrounds no longer wish to join the profession. Mahouts need to be included as professionals and be eligible for welfare funds and other statutory benefits.

Kerala needs to have a multidisciplinary approach to handle these sensitive issues. It is suggested that a separate cadre for captive elephants be formed under the auspices of the Chief Wildlife Warden of the State. In Kerala, the elephants sometimes need to be in places which have a high level of mob frenzy. In such cases, extra care should be taken for the protection of elephants and mahouts against abuse by the public. Special focus should be on ownership issues. This should cover transfers, constant monitoring of animal, owners and mahouts and welfare. Currently illegal transfers are on the increase, keeping traditional people out of the scene with speculative price rising to as high as 30–50 lakhs for a good young tusker. It involves vast sums of unaccounted or black money transactions in uncontrolled and illegal business transactions and corrupt business practices.

Implementation of microchips

Understanding the status and physically counting the actual number of animals present in the state of Kerala have always been a formidable task. Registration of new ownership and monitoring the ownership would be the best measures to assess the welfare of the animal. This however was not possible due to many factors. The concept of micro-chipping of elephants began in India in 2003. It is of utmost importance to monitor and implement the norms. However, there are problems in completing this process in Kerala. This is primarily because there is no separate staff assigned for this specific task. The problem prevails in every territorial jurisdiction. Employment of range officers in taluks (district/sub-division) is required. Many awareness programs were conducted and overall progress is monitored by the Hon. Minister for Forests and the Chief Wildlife Warden (CWW). In Kerala, there is support from media which offers creative criticism. Elephant owners are very skeptical and fearful of the media. There is difficulty in the implantation of microchips due to public apathy to such a measure. This process requires a large number of veterinarians. It is equally important to register the mahouts.

Recommendation for the welfare of captive elephants in Kerala

The value of captive elephant has not been defined. No serious research is being conducted on new methods of management. Efforts to preserve the gene pool of the captive elephant are also lacking. Multidisciplinary and comprehensive action needs to be initiated.

Suggested Readings

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Biographical sketch



Dr. E.K. Easwaran, is Forest Veterinary Officer, Konni, Kerala. He has extensive experience in dealing with Kerala's elephants. He is guest faculty on wildlife veterinary aspects and captive elephant management at the College of Veterinary and Animal Sciences, Mannuthy, Kerala, Veterinary Council in its continuing veterinary education programme, Forest Schools at Arippe, Thiruvananthapuram and Walayar, Palghat Dt. and at the "First European Elephant Management School", Hagenbeck Tier Park, Hamburg, Germany, since November 2004. He is also Technical Officer in charge of Microchipping and Registration of captive elephants, Training to mahouts (for the entire state of Kerala),

Elephant Rehabilitation Centre, Forest and Wildlife Department, Kottor, Thiruvananthapuram, Kerala. He has also travelled extensively in Europe and USA to study the hands off/protected contact (chain-free) system of captive elephant management.

Caring captive elephants, HIS' way

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Abstract

Jaipur has 115 captive elephants of which 111 are females and 2 are tuskless males or 'makhnas' and two are baby elephants. 'Help In Suffering (HIS)/Elephant family (EF)' initiated steps in Jaipur in 2003 to oversee the welfare of captive elephants. The elephants used to suffer from many health problems; the keepers lack basic knowledge of elephant caring and practice harmful and painful treatment patterns. The mahouts are very poor and illiterate. They get meagre salaries, have large families to support and drug addiction is common amongst them. HIS/EF has been working on long-term welfare of both the elephants and their handlers. HIS/EF provides free treatment, educates owners in a participatory approach and counsels mahouts in protecting their rights. This is achieved through two distinct approaches: enforcement method and participatory method.

Introduction

Elephants are not found in the wild in Rajasthan. In the past, they have been used for hunting, processions and war. Their new role is to entertain tourists. Since there is need to focus on the welfare of captive elephants in Jaipur, an effort was initiated in 2003. The motivation to initiate welfare measures is poor stabling, prolonged chaining, mishandling by mahouts, injuries to the eye, nail cracks, sunburns and saddle sores (Figures 1a, b, and c). The mahouts' lack of knowledge of elephant care and welfare is the last objective on their priority list for the animal; they still practice harmful and painful treatment ways. For example, an elephant had a maggot infestation on the base of its tail and the mahouts poured kerosene on the wound to get rid of the maggots.

Mahout–elephant bond

The bonding between the elephant and the mahout (Figure 2) is very poor in Jaipur. Constant change of mahouts results in unfamiliarity between man and animal, which is detrimental to both.

Socio-economic background of mahouts

- Poor and illiterate
- Poor income
- Big family to support
- Drug addiction
- Lack of awareness about animal welfare
- No job security
- Ill-treatment by the owners

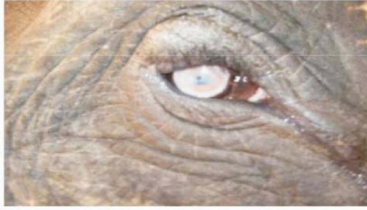


Figure 1a: Injuries to the eye.



Figure 1b: Sun burns.



Figure 1c: Cracked feet, foot rot, and cracked nail.



Figure 2: Interaction between elephant and mahout.

Help In Suffering(HIS)/elephant family(EF) approach towards captive elephant welfare

HIS/EF has been working in Jaipur to develop long-term welfare measures for both the elephants and their handlers. As confident-building measures, HIS/EF provides free treatment; educates owners in a participatory approach and counsels mahouts on their rights.

To achieve this, two distinct approaches are followed: 1. Enforcement method, and 2. Participatory method

1. Enforcement method

Rules and regulations against cruelty to elephants have to be strictly enforced. Design of stables is a key factor in the welfare and HIS/EF designed proper enclosures, better water facility and insists on the use of reflectors on elephants during evening and night (Figure 3a, b & c). These were achieved with the complete support and cooperation of the Government of Rajasthan.



Figure 3a: Better shade, with the enclosure roof being 25 feet high.



Figure 3 b: Better water facility.



Figure 3 c: Reflectors on elephant at night and evening Times.

2. Participatory approach

Through this approach, frequent meetings are conducted with owners since owners are decision makers. The use of wooden stick as opposed to the ankush is encouraged. A daily scrub bath as per availability is also encouraged. Mahout awareness programmes are conducted using school children in dramas and street plays. This advocates animal welfare and avoids the use of ankush.

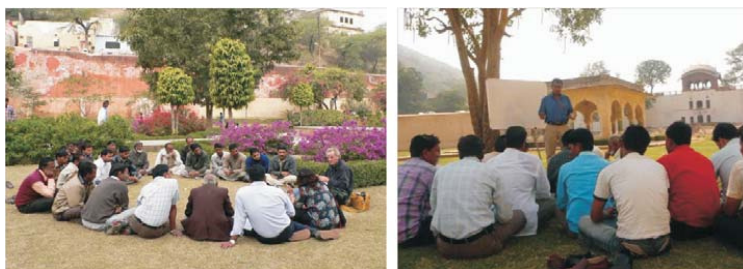


Figure 4: Participatory approach—frequent meetings with the elephant keepers.

Overall success of the welfare of captive elephant in Jaipur is related to other associated factors. These are:

- Identification of existing elephants through microchipping
- Control on the movement of elephants to the state from outside.
(Movement of elephants between states should be banned. For example, an elephant employed for begging that came from Delhi collapsed in Jaipur due to starvation.)
- Restricted number of rides per day

Conclusion

Help In Suffering (HIS)/Elephant Family (EF) has been very successful in working to develop long-term welfare measures for both elephants and their handlers in Jaipur. This is achieved through two distinct approaches: enforcement and participatory methods. However, captive elephants are a bitter reality; consequences of banning them from a working situation need to be well thought of, as is true for every action. In an ideal world there should not be any captive elephants. But since they are around, and until they find some worthwhile job, nobody will take care of them because of the huge expenditure involved in maintaining them. So if we ban them from work we will find more elephants begging in the city for survival, thus creating a far worse situation. It is hoped that Help In Suffering/Elephant Family will succeed in achieving better welfare for the Jaipur elephants.



Biographical sketch

Dr. Madhulal Valliatte did his B.V.Sc. from Hyderabad Veterinary College, Hyderabad, in 2001. Initially for a brief period he worked as junior embryologist at CRAFT–Kerala. He has worked briefly on captive elephants in Kerala and was trained by the ‘Elephant Doctors’ of Kerala Dr. K. C. Panicker, Dr. Cheeran and

Dr. Muralidharan. Presently, he is the Team leader of elephant family/Help In Suffering elephant welfare project at Jaipur and is working for the welfare of captive Asian elephants for the past 6 years. He has received the Eco Warrior Award from the Hon. Vice-President of India in June 2008.

Historical, cultural and modern perspectives on captive elephant welfare and management

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Abstract

Elephants were first tamed more than 4000 years ago in India and it has a long history of keeping elephants in captivity. Asia has about 45,000 wild and over 15,000 captive elephants. Welfare is important to the conservation of the Asian elephant as one in every three–four elephants is in captivity. Traditionally, different systems have been practised to capture and train elephants across different regions; of these, certain training systems are not desirable and the wrong traditions of elephant capture and training may be exported to other regions.

Elephants are highly social animals, with complex behaviour and learning capacity, and even an awareness of self. In most forest camps in India the animal has the freedom of socialising, but those in temples, zoos, and some other situations are kept solitary. Elephants have superior cognitive intelligence and therefore deserve complete respect. Current management systems need to take a realistic approach as against the idealistic view of not having any elephants in captivity. One cannot wish away the elephant in captivity at present. Elephants have a long life span, have to be cared for for many years, during the course of which more may come into captivity due to a number of reasons— conflict with humans, fragmented populations that are non-viable or animals that meet with accidents. Our goal should be to set high standards of welfare and management with a continuous process of enforcing these standards.

Introduction

India takes justifiable pride in its cultural, social, political and religious history with the elephant. In comparison, African elephants were also tamed but this culture faded away quickly. They were taken into captivity in North Africa, but with the extinction of wild elephants in that region, even the captive population died out. Since captive elephants have been an integral part of India's history, why do we need to look into welfare now? While studying the history of elephants in captivity in India, it is seen that their captivation peaked during the Mauryan time. Importance of having captive elephants was far greater then compared to now. Logging and military purposes were the biggest reasons for keeping elephants then. But both these reasons are invalid today. However, it could happen here as well that the culture of keeping elephants dies out, as has happened in Africa. Asia has about 45,000 wild and over 15,000 captive elephants. African elephants are also seen in captivity but their number is very small. Since the number of captive Asian elephants is very high, it is important to set standards for their welfare and monitor their enforcement. Western zoos have shown a lot of interest in the welfare of elephants.

Systems of capture

Traditionally, elephants were captured using methods that varied across different regions—the *kheddah* system was practised in northern India whereas the pit method was followed in the south. Even the methods of training are different across regions, and each region tends to justify that what it follows is the best method. It is clear that certain systems of capture and training elephants are not desirable. Some of the more

cruel systems of elephant capture and training get exported. Sumatra has captured elephants legally in recent decades. It has adopted the system of capture and training from Thailand which has resulted in a very high mortality rate of captive elephants and many injuries. Mortality in such large numbers, by the use of wrong kinds of tradition, leads to failure of the entire process and aim of having captive elephants. The more we observe the plight of captive elephants across Asia, the more evident is the urgent need for welfare standards.

The effect of captivity on the elephant's social organisation and intelligence

Elephants, as a species, are highly social, with complex behaviour and learning capacity. Even western zoos have recognised that keeping elephants solitarily causes social disruption. In most forest camps in Asia they have the freedom of socialising. On the other hand, those in temples, zoos, and some other situations such as private ownership, are kept solitarily. Intellectually speaking, elephants are a good match for humans! Recent studies show that elephants have an awareness of self. Until then it was thought that only humans and some primates exhibit awareness of self. With this additional knowledge, it is beyond debate that elephants have superior cognitive intelligence and therefore deserve greater respect than hitherto accorded. Culturally, even since historical times, elephants have always been an economic factor, along with playing military and political roles. In today's world, their roles are much more limited, as for instance their use in festivals. Elephants are considered sacred in India and for this reason they will probably continue to be maintained in captivity.

Practicality versus idealism

Our present management of elephants needs a realistic approach as against the idealistic view of not to have any elephants in captivity. Some elephants will continue to come into captivity as with orphaned elephants or those that were captured as a result of man–elephant conflicts. Elephants also have a long life span, so we have to be prepared to care for them for several decades into the future. During this period, more elephants will come into captivity from non-viable, isolated elephants inhabiting fragmented patches of forest. In places with high levels of elephant–human conflict, people will either eliminate them or will bring them into captivity. Hence, it is imperative that we pay attention to the welfare of captive elephants. To give one example, we need to redesign the heavy iron howdahs used to carry people. In order to achieve comprehensive welfare of elephants in different systems of captive management, it is evident that more resources are required. This calls for raising the stakes of elephants considerably.

Mahout's role in captive elephant welfare

The mahout is the key person in elephant maintenance and welfare. Presently, the status of mahouts is low in the social and administrative hierarchy. The salary of a mahout in government service should be at least equal to that of a vehicle driver. Mahouts have to be as skilled as a vehicle driver and face even greater danger in their jobs. Hence, while talking about elephant welfare, the mahout's welfare cannot be ignored.

Conclusion

As mentioned earlier, welfare is important for captive elephant management in India as one in every three–four elephants is in captivity. What cannot be disputed is that captive elephants will continue to exist and the requirement now is to set high standards of welfare and management and ensure that these standards are enforced across all systems of management.

Biographical sketch

Raman Sukumar has been actively engaged in research and conservation of wildlife since the 1970s. His pioneering study of the Asian elephant during the 1980s is much acclaimed. His many awards include the Order of the Golden Ark (1997) and the International Cosmos Prize (2006). Formerly the Chair of the IUCN/SSC Asian Elephant Specialist Group (1997–2003), he is presently Professor and Chair of the Centre for Ecological Sciences, Indian Institute of Science, Bangalore. He is the author of three books on elephants and over 80 scholarly publications and articles in the area of elephant biology, tropical forest ecology, climate change and nature conservation.

Balancing captive and wild elephant populations— a dilemma

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Abstract

Asian elephants, although never domesticated, have been kept in captivity for ages. One would surmise that in the coming years their numbers could increase as the Forest Department will be forced to capture more of the problematic elephants from the wild due to human–elephant conflict. As the number of captive elephants in and around the forests increases, there will be a problem of negative impact of elephants on the quality of the woody vegetation particularly, forage tree species. These aspects may force us to analyse the ecological and economic costs of bringing elephants into captivity and to investigate the possibilities of either keeping the problem elephants in the wild itself, addressing issues such as habitat fragmentation and degradation or even putting an end to their existence in the wild.

While keeping elephants in captivity in most camps even simple care of the elephants that is absolutely essential is not bestowed. We should ban keeping elephants in urban slums as the conditions that exist there are deplorable. In places where mahouts are hired, there is a lack of understanding between the mahouts and the elephants. In such cases traditional knowledge of rearing and humane handling is missing. Mahouts play a critical role in captive elephant management. Opportunities need to be created for the public to contribute to elephant conservation by harnessing their interest, support and compassion.

Introduction

Asian elephants have only been captive and they have never been domesticated. It is likely that their number in captivity, as time goes by, is bound to increase. As the conflict situation increases, the chances of wild elephant being captured increases. The other aspect of the management of captive elephants is their impact on natural habitat, irrespective of the occurrence of wild elephants. Large numbers of captive elephants in a natural habitat can stress the forest ecosystem. One place where this is visible is Kanha Tiger Reserve, where several sal (*Shorea robusta*) trees have been debarked resulting in the death of many.

Human–elephant conflict as a source for captive elephants

In 2007, a human–wildlife conflict workshop was organised by WWF-India in Coorg in collaboration with Karnataka Forest Department, local people and estate owners. The workshop focused on the conflict situation due to the presence of bull elephants that were dangerous to humans and their property. The eventual suggestion that emerged from this workshop was to capture the problematic bull elephants. Officials of Karnataka forest department were confident that the bull elephants can be captured and trained. It appears that the elephant mahouts of Karnataka and Tamil Nadu (largely Kuruba tribals who grow with elephants) are capable of training even problematic bull elephants. Most participants in the workshop were aware of an incident in the late 1990s of capturing and training of a 9-foot tall makhna (tuskless bull elephant now named Murthy) in

Mudumalai Wildlife Sanctuary, Tamil Nadu. He had damaged crops and killed nearly 12 people.

In the wild, tusker numbers are going down very rapidly. One can predict that crop raiders, if they are bulls, would not live long. It is difficult to see large tuskers in the wild anymore. Monitoring of the existing large and young tuskers, with the help of dedicated young forest watchers and wildlife guards in each elephant habitat unit (forest division/ protected area), by giving them digital cameras, should be done. This would give information on identity, location and ranging which could be used to monitor individual tuskers.

Captive elephants and their impact on the woody vegetation

Another problem associated with captive elephant management (if the elephant camps are situated within or near the forests) is the capability of the elephants to affect the woody vegetation around. This, besides Kanha Tiger reserve, can be seen in many forest areas where captive elephants are kept for purposes such as tourism. In Mudumalai Wildlife Sanctuary just to cook food for 25 or so elephants an enormous amount of firewood is required every day. Can we grow native tree species, which are not eaten by wild ungulates (e.g., *Holoptelia integrifolia*), for firewood in a belt of 2 km around Theppakadu elephant camp? In Chitwan National Park (Nepal) over 100 elephants have been kept solely for tourism which has led to habitat degradation. One group of plants that is heavily affected as a result of feeding of captive elephants is the *Ficus* spp. *Ficus* are key stone species in a forest ecosystem as many frugivorous animals obtain a part of their food from various *Ficus* species. In forest areas where we have captive elephants along with wild elephants, sufficient care should be taken to address the problems of weed abundance and forage species regeneration so that quality elephant habitat can be maintained. These suggestions are easier to make but difficult to successfully implement in the field.

Questions and solutions in welfare

As elephant–human conflict is one of the major reasons for the increase in the number of elephants in captivity and as captive elephants in forests have the capability to affect woody vegetation around, an effective management for both the problems needs to be put in place. The questions related to the above are the following:

- 1) Is it possible to continue to keep problem elephants in the wild without affecting humans? Does it make ecological and economical sense to bring them under captivity?
- 2) Is capturing and training of rogue elephants the only solution to address the problem of elephant–human conflict?
Training methods are different in various parts of India. In some instances during training, elephants suffer recurring injuries and undergo stress. Occasionally, mahouts get injured. Even in extreme cases of conflict, permission to eliminate the problem elephant is not easily obtained
- 3) What is the possibility of training adult elephants with less cruel methods? Is training of young elephants easier and not harmful?
- 4) Does over activism of media on training of elephants mar the reputation of elephant managers?
- 5) What are the options in the high conflict zones? Should we drive the elephants into another less-problematic area, capture or kill them?

Problems for elephants in captivity

India is a country where even simple solutions are not implemented. Howdahs in most parts of the range are not comfortable for both the elephants and the riders. One of the best howdahs, made of wood, is seen in Uttaranchal and Nepal. Can it not be used

through-out the country? Basic healthcare for captive elephants is a must and it is not uniform throughout the country. For example, applying of neem oil around the tusks at the base and at the base of nails to ward off infection is not carried out throughout the country. Such simple healthcare could be carried out throughout the elephant range.

When mahouts are hired to handle grown-up captive elephants, there is a lack of understanding between the mahout and the elephant. In such cases, the knowledge of the handling process of the individual elephant and the knowledge that can be accrued by the rearing process are mostly missing. Only in Anamalai, Mudumalai, Nagarahole and Bandipur, southern India, a near ideal mahout–elephant relationship could be found in the elephant camps as the tribal mahouts have the opportunity to grow and live with the elephants. This relationship is difficult to establish in places where mahouts are hired.

Mahout welfare

The above point stresses the fact that mahouts play a crucial role in captive elephant management. All through the country the job of mahouts working with the Forest department should be made permanent. The mahouts should be given quarters near the elephant establishments so that they can be near the elephants even at night if needed. Ideally they must have basic literacy with knowledge of two languages and to read and write, so that they can learn more about elephants and convey to the visitors what they know about elephants. Such mahouts with knowledge of more than one language can participate in training programs in different parts of the country and can contribute to training programs in their homelands. But it will be unfair to expect tribal (e.g., Kuruba) mahouts to know two languages. The language of the commands is also important, as it is difficult to train adult elephants again in different languages. A mahout must try and avoid physical commands which other mahouts cannot follow, as in the case of change or death of mahout, the other mahouts need to know how to handle the elephant. Insurance given to the mahout should involve family benefit insurance and elephant insurance. While assessing the ill-mannered behaviour of the mahout, it is important to note against whom it was directed—the elephant, public or the owner.

Conclusion

As it is expected that the number of captive elephants will increase due to elephant–human conflicts, an effective planning for managing them in captivity and to arrest their impact on the woody vegetation, particularly trees, around elephant camps should be given priority. There should be specific debates on aspects including the ecological and economical costs to bring wild elephants under captivity. Efforts to improve the understanding between the mahouts and the elephants should be undertaken on priority basis. We need to capture the support and compassion of the public to promote conservation of both the wild and captive elephants.

Biographical sketch



Dr. A.J.T. Johnsingh initiated pioneering field research on free-ranging large mammals in India by studying dholes (*Cuon alpinus*) in Bandipur Tiger Reserve in 1976–78 for his Ph.D. He represents IUCN in Asian elephant, Cat, Canid, Bear and Caprinae Specialist Groups. He has published over 75 scientific papers and over 90 popular articles on wildlife conservation. He was awarded the 2004 Distinguished Service Award for Government by Society for Conservation Biology for his exemplary contributions to the conservation of mammals and forests in South Asia through leadership, guidance and inspiration, the Carl Zeiss Wildlife Conservation Award 2004 for lifetime service to Indian wildlife and the ABN AMRO Sanctuary lifetime Wildlife Service Award in 2005. He has written two popular books: On Jim Corbett

Trail and Field Days. Presently he lives in Bangalore and works for the Mysore-based Nature Conservation Foundation as its Eminent Wildlife Biologist and for the World Wide Fund for Nature, (WWF)-India as Honorary Scientific Advisor.

Vision of Project Elephant (MoEF) for captive elephants in India

A.N. Prasad

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Abstract

Elephants are a flagship species and bear strong cultural and social bonds with the people of India. In view of the recent history wherein many species of flora and fauna are threatened, the Government of India, recognising the importance of documentation and welfare of captive elephants, which are Schedule-1 animals under the Wildlife (Protection) Act 1972, formed an expert committee in 2003 to study the conditions of elephants in captivity. The committee has brought out that captive elephants in the north-east and in forest camps throughout the country are in better shape than temple or begging elephants, especially in north India. Except for Kerala, unfortunately, no state has come up with any norms or regulations. Some scientific documents that are available have been helpful for identifying welfare status, but a detailed study that covers the conditions of elephants throughout the country has been lacking. A detailed investigation will be the major step for adopting policies and monitoring the captive elephants.

The time is ripe to start a countrywide legislation for captive elephants based on scientific data, which will be practical to implement at the field level. The Government of India guidelines should be such that it should facilitate the elephants' owners as well as the State Forest Department to safeguard the interests of these animals. The standard of elephant-keeping should rise to the welfare parameter identified and suggested by the workshop on welfare parameter and their significance for captive elephants and their mahouts in India.

Introduction

Government of India is concerned about the upkeep and maintenance of about 4000 captive elephants in the country. Being a flagship and Schedule-I species under the Wildlife (Protection) Act, 1972, their welfare is the responsibility of the central government. Concerned with the conditions of the captive elephants in the country, Ministry of Environment and Forests (MoEF) constituted an expert committee*. The Committee submitted its report in 2004. The findings of the Committee suggest that the welfare and care standard of captive elephants in India vary considerably depending on the region of occurrence and ownership. Those in Rajasthan, Delhi and Agra, which are used primarily in tourism, ceremonial purposes and begging are subject to worst forms of stress and lack of care. Overall health of the elephants indicates that the elephants localised in urban conditions that individuals own are in worse stress levels followed by some of the temple elephants.

In comparison, the private elephants in the north-east and the elephants kept in the forest parks and sanctuaries throughout the country have better welfare standards. The elephants of Delhi were under varied conditions. Some had reasonably good health, but others suffered from malnutrition, run-down health condition, corneal opacity and abscesses on their legs. In some cases, overhead concrete provided shade while in others there was no such luxury. Bathing was normally in the Jamuna river.

*Under the Chairmanship of Mr. S. C. Dey, Retd Additional Director General (Wildlife) in 2003 with Dr. P.C. Alex and Dr. Anwaruddin Choudhury as Members and Mr. P. Subramanyam, Regional Deputy Director (South Region) as Member-Secretary.

The elephants in a number of temples in South India suffer from unhygienic conditions of pilkhana, lack of proper bathing facilities, especially facilities for wallowing. Some of the elephants were suffering from abscesses and intestinal diseases, despite expert veterinarians being available for treatment. Government elephants in Karnataka (Bannerghatta) were comparatively in better condition with adequate staff and veterinary support available for their care. They were also regularly being taken out for collection of fodder and bathing in big ponds or rivers, as per availability.

The elephants of Assam suffered considerably from wounds and abscesses and toenail cracks with significant foot lesions. They also suffered from skin abnormalities and broken tusks. Anaemia was also reported in significant degree in some elephants. The Andaman elephants were found to be in better condition and kept under forest cover. With very little work demand on them now, they were also not under any stress. Some superficial skin wounds, side gall wounds and partial cataract were, however, seen in a few elephants. The general feeding and other care of the elephants were regularly supervised. The health condition and feedings were also monitored regularly by the supervising officer as well as the forest veterinary officer.

A study* conducted by Wildlife Trust of India in 2001, examining the health of 98 elephants inspected, indicated that nearly one-third of the elephants had poor body condition, localised or generalised oedema and hypo-proteinaemia. Many of the elephants were also partially dehydrated and 26 were found to be anaemic. Thirty-four of the 98 elephants had problems with their eyes, the most common defect being corneal opacity. Lacerated wounds and/or abscesses were detected in 23 animals. Toenail cracks and or footpad fissures were seen in as many as 30 elephants.

Welfare measures and outcomes

- Based on the findings, the Committee suggested basic minimum norms and standards for housing, watering and bathing, feeding, gear, load, working hours, transportation, treatment, record-keeping, etc. for the welfare of the captive elephants. It also suggested measures for the welfare of mahouts and for development of course content for veterinary training
- MoEF has requested the States to take actions on the report and also suggested framing of rules on the lines of Kerala Captive Elephant (Management and Maintenance) Rules, 2003. However, the States have not responded so far
- Section 42 of the Wildlife (Protection) Act, 1972, provides issuance of ownership certificates in respect of captive animals provided Chief Wildlife Wardens (CWLW) are satisfied that the owners have adequate facility for housing, upkeep and maintenance
- As a result, a detailed guideline was issued to the States for their upkeep and maintenance in 2007, adopting more or less the norms and standards provided in Kerala's rules
- In addition, the Ministry took a decision to create elephant rehabilitation centres in different zones of the country where abandoned and seized elephants could be kept or private elephants could be sent for rejuvenation. Assistance was provided for three such centres, one each in Haryana, Kerala and Orissa. Proposal is awaited from the north-east
- For proper veterinary care, two regional centres of excellence have been declared, one in Guwahati, Assam, and the other in Thrissur, Kerala. Mahouts and veterinary care trainings are being organised every year

*As a part of an outreach and training programme, headed by eminent veterinarians Dr. K.C. Panicker and Dr. J.V. Cheeran.

Conclusion

Central Government's vision is to provide best of care and facility to the captive elephants. In order to facilitate the CWLWs to objectively assess and monitor the upkeep and maintenance as provided in the Act, it is our endeavour to provide easy monitorable parameters. The workshop organised jointly by Compassion Unlimited Plus Action (CUPA) and Asian Nature Conservation Foundation (ANCF) on welfare parameters and their significance for captive elephants and mahouts in India, has been supported by MoEF with the objective of identifying welfare standards and, after the end of the workshop, we would be in a position to arrive at a consensus on the parameters and give a recommendation to the Ministry based on scientific norms and practicality.

Biographical sketch



Awadhesh Nandan Prasad, Inspector General of Forests (IGF) & Director, Project Elephant of the Ministry of Environment & Forests (MoEF), Govt of India (GOI), joined Indian Forest Service in 1979 as Jharkhand Cadre. Since 1983, Mr. Prasad has worked as Divisional Forest Officer in Patna, Gaya and Singhbhum in erstwhile Bihar State, Working Plan Officer, Patna, Deputy Inspector General of Forests, MoEF, GOI, New Delhi, Additional Resident Commissioner, Government of Jharkhand, Conservator of Forests–Cum-Field Director, Palamu Tiger Reserve and since 2006 working as IGF & Director, Project Elephant. Mr. Prasad has

served in many important committees, drafting of National Working Plan Code, for creating National level authority as per orders of Apex Court to manage & monitor Compensatory afforestation fund. During his period as Field Director an expert team had been formed by GOI to evaluate all 28 Reserves. On the basis of 45 IUCN criteria, Palamau has been rated as the 6th best managed Reserve, and along with other 5 Reserves was placed in the highest category. He has represented India in the Interpol wildlife working group meeting in China in 2006, was a Chairperson of the Steering Committee of South Asia Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)/Monitoring of Illegal Killing of Elephants (MIKE) Programme (2006-07), and represented India in the 32nd World Heritage Committee meeting in Quebec City, Canada in 2008.

Captive elephants and their management–WTI’s vision

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Abstract

Wildlife Trust of India (WTI) has been involved in captive elephant welfare since 2000. Major activities that are regularly taken up are in health support to captive elephants through organised health camps and through mobile veterinary service units stationed in different wildlife sanctuaries and national parks. WTI has been conducting health camps regularly in Sonapur Mela, Bihar, where elephants are bought and sold. The percentage of micro-chipped elephants coming to this Mela has been increasing steadily and in 2007 about 70% of the elephants brought to the fair were already micro-chipped. About 15–20% of the elephants brought to the Mela every year are young calves, below five feet in shoulder height. Though most of the owners claim them to be captive born, it is obvious that many are illegally caught from the wild.

Apart from health camps, WTI also conducted a nationwide survey on the welfare status of captive elephants in 2006. The survey covered about 2400 elephants in all the States where captive elephants have been reported. WTI has also taken up rehabilitation to the wild as a welfare measure for rescued elephant calves. Five calves were reunited with natal herds shortly after their rescue and if attempts to reunite fail they are taken to the Centre for Wildlife Rehabilitation and Conservation (CWRC) in Assam for hand raising. Of the 14 that have been hand-raised successfully, three have been rehabilitated successfully, four are in the process of being rehabilitated and released and the remaining are waiting to be relocated to the release site after complete weaning. The released calves are radio-tracked to ensure their successful reintegration in the wild.

Elephants are social animals and have a matriarchal society but captivity subjects them to lead a solitary life. Captivity predisposes the elephants, especially those living in unnatural habitats and in urban environs facing urban dangers like road accidents at night. There are 32 elephants in Delhi, which live on the bank of the Yamuna River. As a welfare measure, WTI has been distributing reflectors to these elephants to avert accidents at night. Elephants who develop permanent disabilities owing to such accidents have to be invariably euthanised but they invariably suffer due to delay in procedural formalities. An adult female elephant (Name: Arundathi) in Rajaji National Park with a fractured leg was in sternal recumbency for more than a week till it died. Her pulse rate was three times faster than normal, an obvious indication of the heart speeding up the blood circulation due to pressure on the lungs. In such cases, the decision to euthanise should be left to the attending veterinarian to avoid procedural delays. Project Elephant has now issued a directorate on euthanasia after consultations with the Wildlife Institute of India. The procedure is available on the Ministry website and can be accessed by all.

Biographical sketch



Dr. Ashraf completed his Bachelor degree in Veterinary Science (BVSc) from Chennai in 1985 and Master's in Wildlife Science from the Wildlife Institute of India (WII) in 1990. In 1992, he joined the upcoming Coimbatore Zoological Park (CZP) and worked as Veterinary Officer and later as Assistant Director. Dr. Ashraf joined WTI in 2001 as the Coordinator of the Wild Rescue Program and became its Director in 2006. He has been

instrumental in the creation of WTI's wildlife rehabilitation centres like the CWRC and Centre for bear rehabilitation and conservation (CBRC) and the three rehabilitation stations (rhino, elephant and buffalo) and all the rehabilitation projects associated with them. Currently, he is in charge of species surveys as well. His interests include wildlife rehabilitation, zoo exhibit designing, endangered species survey, conservation breeding, ecology of small mammals and wildlife medicine.

Status and management of captive elephants in Assam

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Abstract

There are 5312 wild elephants and 1200–1500 captive ones in Assam. Registering them officially is very difficult as they roam freely among all the seven North-Eastern States. The captive elephants in Assam live in near-natural social grouping and a good number of calves is born to captive cows. They have habitats with abundant natural vegetation around the year and feed and water are available everywhere. Many captive elephants live in near-natural conditions in many national parks and wildlife sanctuaries. Seven per cent of elephants are used in wildlife management, anti-poaching patrols, even census work and tranquilisation of big game. Five per cent are used in tourism and as *kunkis* to drive away wild herds. *Kunkis* are trained captive elephants that are engaged in different wildlife management practices like capture of wild animals or driving of wild herds of elephants from paddy fields. There are also many in the tea gardens. They are used for activities such as logging. A few elephants are also used for religious functions and ceremonies but not to the extent as in the South.

Assam has its own well-established welfare tradition; the effective method for capture of wild elephants used in Assam is the 'lasso' method. Carrot and stick method of training is followed. Chain burns are minimal. Spike chains are used only on unruly elephants. Milk bottles are specially designed for orphaned calves. Saddles/howdahs are designed keeping welfare in mind. Logging that is carried out without a harness can create big problems for the elephants. Elephants should not work during midday, and if they are walked along roads or habitations at night on work, reflectors should be used on them.

There is an evident lack of veterinary care. Veterinarians numbering 150 have been trained so far to handle elephants which have improved their medical care to a great extent. Mahouts are the first line of victims in elephant-caused injuries. The front-line mahouts have moved out to other vocations owing to poor compensation. Forty percent of mahouts come from mahout families. Of the mahouts in north-east, 80% are illiterate, 95% are alcoholics, 25% use opium/ganja and 95% have no formal training. The salary is generally Rs. 1500+400 (1 US \$ = 43.75) per month. They have no periodical health check-ups and neither is there insurance cover. Mahouts also need to be specially trained in handling musth bulls. Quality of life for mahouts should be improved. Government and public support for this is essential. Productive engagement should be explored. The states of Assam and Kerala should include elephant healthcare chapters at undergraduate veterinary course itself.

Biographical sketch:



Dr. K. K. Sarma, Associate Professor, Department of Surgery and Radiology, College of Veterinary Science, Assam Agricultural University, Guwahati, did his Ph.D. in elephant anaesthesia and has pioneered the use of modern veterinary care of elephants in the north-eastern region of India. He has published over 100 scientific papers in national and international journals and authored over 50 popular articles to spread the message of conservation and welfare of animals. Dr. Sarma also worked in Sumatra, Indonesia, as

an international expert for improving the healthcare and management status of Indonesian elephants at the behest of World Wide Fund for Nature (WWF)-International.

Challenges in managing captive elephants in Assam

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Abstract

There are 1142 captive elephants in Assam of which 874 have been micro-chipped. Some of the calves are yet to be micro-chipped. The number of elephants for which ownership certificates have so far been issued are 471. The main reason for the inability to issue the certificates to the remaining elephants is either ignorance among the owners about the declaration, missing original documents, inability to produce the elephant physically or non-acceptance of birth certificates. Another major hurdle is to ascertain whether the elephant is born in captivity or captured from the wild.

In Assam, most elephants are maintained in near-natural conditions. There is unemployment among the existing captive elephants. In addition, mahouts are paid very little, which sometimes affects the proper upkeep of the elephant. The possession of an elephant is considered a status symbol in Assam also. Timber logging is almost nil in most areas. Scope for engaging the elephants in joy rides is also very little. Begging by elephants, sometimes in the streets, is not part of any inherent cultural or religious tradition in the State, but an event, wherein the mahouts exploit the opportunity of earning some extra money from the passers-by, who feel happy by offering something to the elephants because of their reverence to the animal. Inter-state transportation of captive elephants is legal but is highly criticized without any justified reason.

Biographical sketch



M. C. Malakar is an Indian Forest Service (IFS) of the 1976 batch from the Assam-Meghalaya Joint Cadre. In 1980, he was promoted to the rank of Divisional Forest Officer in 1980 and served in different Territorial and Working Plan Divisions till 1989. On promotion to the rank of Conservator of Forests, he became the Founder-Principal of the North East Forest Rangers College, Jalukbari, Guwahati in 1989 and served there three years. In 1997 he was promoted as the Chief Conservator of Forests (Territorial). After serving there for 5½ years, he became the Chief Conservator of the Forests (Wildlife) and the the Chief Wildlife Warden in 2003. In 2007, he was promoted as the Principal Chief Conservator of Forests (Wildlife). Mr. Malakar has the wide experience of working in both the wildlife as well as the territorial wings. He holds a Master's degree from Edinburgh University, UK, where he studied from 1992 to 1993 on the subject of Education in Forestry and Natural Resources. Mr. Malakar strongly believes that conservation without the participation of the local community is not possible. Protection of wildlife and their habitats can be achieved only through eliciting full co-operation from the local community by providing them alternative livelihoods and reducing their dependence on the forest landscapes.

Status and challenges in managing captive elephants in Karnataka

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Abstract

The elephant for many Indians symbolises Ganesha, the God of knowledge, and elephants have been a part and parcel of the culture of Karnataka State. A study on 131 captive elephants was conducted in Karnataka in 2007. It revealed that the highest standards of welfare were seen in most forest camps followed by temples and lastly by private personnel.

An elephant's welfare in captivity should encompass its feed, veterinary care and expression of natural behaviour. Elephants which do not have a dwelling place are made to walk on roads, perform and repeat acts of blessing and begging, are poorly managed and are not looked after well. Certain guidelines should be put in place to raise the effectiveness of their management. Forest camps with their natural surroundings are ideal but even they need to be monitored and controlled. These camps should be at places where all facilities are present. Elephants are chained even in forest camps but hobbling has to be avoided.

There is also a need to check elephant movement for various purposes between Kerala and Karnataka, within coffee estates and those used for timber logging. Certain records such as those of body measurement and food need to be maintained regularly. Captive elephant welfare should involve not only owners and mahouts but also researchers and NGOs. Utmost importance should be given to the risky working conditions and health status of mahouts and cawadis.

Biographical Sketch



I. B. Srivastava is the Principal Chief Conservator of Forests (WL) & Chief Wildlife Warden (CWLW), Karnataka since June 2007. He joined the Indian Forest Service in 1975 and was allotted Karnataka Cadre. From 1975 to 1978 during his probationary period Mr. Srivastava completed the forestry training at Dehra Dun and Medikeri Forest Division (Karnataka). He worked as Assistant Conservator of Forests (ACF) at Tarikari between 1978 and 1980. From 1980 to 1992, Mr. Srivastava worked as Deputy Conservator of Forests (DCF) at Puttur Rubber Division, Tumkur Division, Bidar Division, Hassan Division and Mysore Working Plan Division. From 1992 to 1997, he served as Conservator of Forests on deputation to the Ministry of Environment and Forest (MoEF), Government of India at its Regional Office in Lucknow. From 1997 to 2003, he worked as Chief Conservator of Forests in the Karnataka Forest Corporations and the Development Wing of the Karnataka Forest Department. In 2003, he became the Additional Principal Chief Conservator of Forests (P&A) and then was promoted as Principal Chief Conservator of Forests (PCCF) during 2005. As PCCF he worked as Managing Director of Karnataka Forest Development Corporation (KFDC) and is presently the CWLW of Karnataka.

Status and challenges in managing captive elephants in Kerala

K.C. Panicker

Elephant Welfare Association, Trichur, Kerala.

Abstract

Kerala has more than 750 elephants and most of them are obtained from outside Kerala. Hence, there are lots of problems with respect to their welfare. Though the elephants are maintained generally well there is no work for many of them. Ceremonies and religious processions are the only available work. The mahouts are mostly uneducated but can handle their elephants well. An elephant being chosen for festivals is a very important matter for the mahouts. Mahouts make their elephants appear big in order to get them selected. An elephant is essentially a wild animal; even captive elephants can be unpredictable at times. It all depends on their behaviour pattern. Proper training and awareness of mahouts is of utmost importance. Information centres such as the one belonging to Thrissur temple and owners should be established all over India. After the recent report of a musth elephant goring the mahout, the Government of Kerala has issued new directives for mahouts and owners. A training program of 5–7 days is organised at the Guruvayoor Temple. New mahouts need to be in training for at least two years.

Biographical sketch



Dr. K. Chandrasekharan (Dr. K.C. Panicker), retired Professor, College of Veterinary and Animal Sciences, Kerala Agricultural University, is a senior elephant clinician and expert on elephant diseases. Presently, he heads the Elephant Welfare Association (EWA), a registered NGO based in Thrissur, Kerala, as its secretary. As a member of the elephant drug immobilisation team in Kerala, he has been instrumental in controlling many captive elephants that became uncontrollable during temple

festivals. His book in Malayalam, *Aana Kadhayum Karyavum* (Elephant Facts and Fiction) was published by the Kerala Agricultural University. He is a resource person for various training programmes and has written many articles on different aspects of captive elephant management, many of which were published by EWA. Currently Dr. Panicker is member of the Steering Committee of Project Elephant, Ministry of Environment and Forests, Government of India.

Management and veterinary care of captive elephants in Anamalai Forest Camp

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Abstract

In Anamalai Forest Elephant Camp, the protocol designed by late Dr. V. Krishnamurthy is primarily followed for healthcare, de-worming, vaccination, musth management and other aspects associated to the veterinary practices of the camp. Although a qualified veterinary officer is assigned for the camps, the major drawback is that no permanent veterinarian is based at the camp.

Records maintained show only 5–6 diseases in the wild but numerous diseases which affect elephants are unknown. However, the major health-related issues faced by captive elephants in the camps are gastro-intestinal problems, herpes virus, traumatic injuries, foot and eye problems and musth management. Gastro-intestinal problem is one of the major problems in the camp and herpes virus is an increasing threat to captive elephants. Already two individuals in Vandalur, four in Anamalai camp and one in Mudumalai have succumbed to this disease. Musth bulls have been known to run away into the forest by undoing chains or attacking mahouts and other elephants when chains are being removed.

In the Anamalai camp, an elephant that came from a temple in Tamil Nadu was diagnosed with tuberculosis and rescued animals could be one of the major sources of infections for both wild and captive elephants of the region. The future of the camp depends on the number of reproductive females found in the camp, and there are only a few females around. It is interesting to note that one wild female which was captured as it was raiding crops is docile but runs away when males approach her.

Biographical sketch



Dr. N.S. Manoharan, Forest Veterinary Officer, attached to the Forest Department of Tamil Nadu, has done his M.V.Sc. from Madras Veterinary College, Chennai. Initially he worked in the Animal Husbandry Department, Government of Tamil Nadu, as veterinary surgeon and was deputed to Arignar Anna Zoological Garden in 1994 where he worked till 2000 as Zoo Veterinary Officer. Between 2000 and 2005, he worked as Director of V.O.C. Park and Zoo, Coimbatore, Tamil Nadu. Since 2005, he is working as Forest Veterinary Officer; he has experience in

in-situ and ex-situ conservation, is trained in tranquilisation and capture of both captive and wild animals.

Section 3: Observations by a volunteer

Workshop on welfare parameters and their significance for captive elephants and their mahouts

Listening to experts

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“Who me?” was my reaction when I was called out to be an observer of Work Group Two. I was confused for I did not know what I was supposed to do and I thought to myself “Okay, let’s wait and watch”. I pulled a very heavy chair and sat next to the experts with a smile on my face, still wondering about my duties. The experts, as also me, were handed over a booklet containing quite a few questions. Opinions or answers for these questions were sought through the experts and thereon we started.

“How many hours of sleep does an elephant require?” was the first question on the fine printed document. The experts felt that a full-grown elephant requires a minimum of 4–5 h of sleep and the calves an extra few hours. They also emphasised that the elephant should not be made to work during the night as it is usually during this time that they tend to rest and in any case if they are made to work during the night, they might be forced to sleep during the day which could often affect their health. In addition, an expert was quick to point out that the elephants dissipate at night the heat generated during the hot day hours and if they are made to work during the night, it would affect their health badly.

Once the first question was handled successfully, I realised that the experts have so much of passion and enthusiasm that even the finest details were not neglected. While I was lost in this thought, we moved on to the next question and so I tuned myself to it.

The next question was “How many hours should elephants exercise in the form of walking and will it be right to chain them?” To this, most experts felt that it would depend on the place where they reside. For instance, if they are in a zoo, then for obvious reasons, they cannot be allowed to walk freely, so it is recommendable in such a situation that the elephant be chained to allow it to move in a certain area only. However, this I found to be intriguing because I believed they had the right to move around as long as all precautionary measures were taken to safeguard against any damage. In any case, a zoo elephant should have access to a huge area for it to move around freely without being chained.

As the discussion progressed the experts debated as to the duration of walk necessary for all elephants, to which most if not all, agreed that it should be a maximum of 15 km a day depending on the terrain, inclusive of rest at least once every hour. A discussion was initiated on the various problems associated with the elephants’ exercise of walking. One expert remarked that elephants that do not walk often have nails grown (the constant walking naturally trims their nails) to such an extent that it would be very painful and result in nail splitting. On the other hand, the overheated tarred roads hurt the elephants and this can be overcome by applying gel on the pad below their feet. The way to protect them against heat on the pad below their feet is through the application of mustard oil, medicated vaseline, neem or castor oil.

The experts were quite involved with the discussion. One surprising fact that emerged was that elephants have sweat glands. I had always believed that they do not sweat

and that their body is cooled by increase in blood flow in their ears leading to flapping (of the ears). Also, it is known that they cool themselves by bathing. An expert mentioned that it was a recent discovery that elephants have sweat glands and they are present sparingly in the body, at the back, adjacent to the feet. It was amazing and yet I had many more questions on this theory but then I thought it best to leave it to the end of the discussion.

The discussion slowly drifted to chaining while grazing. Some felt that it was not required and some said they should be. Although it was to seek the welfare of the animal, still experts felt that by not chaining the animal, they might actually lose out on certain points. Since views differed, it was decided that chaining or not should be left to the management as the animal might be killed or get lost while grazing. The solution would be based on the nature of the region. It was also emphasised that the place where the elephant is chained will also matter as sometimes it might lead to damage of the leg tissue. So, alternate legs must be used for chaining.

The question about the period of interaction with fellow animals was an absurd one since elephants are social beings and their interaction should not be measured in hours or minutes and it should depend on their choice. Sometimes the animal exhibits stereotypic behaviour, this is because they are not placed in social groups.

The next question was whether its behaviour depended on the way it is managed. For example, is an aggressive animal a result of bad management? Management plays a vital role but it cannot be solely responsible for the behaviour as every elephant is an individual and has its own characteristics (or free will), although managements could be blamed for not training the elephants properly.

And finally the most important question that even the elephants would be interested in is which food was the best for the elephant—natural or processed? The majority felt that natural food was the best for the elephants; however, cooked food can also be given as elephants possess a very weak digestive system. The approximate time taken by an elephant to digest its food is about 6 h. Also, during pregnancy they could be given special food. As the discussion progressed, it took a humorous twist, when a video was played wherein an elephant ate fish and the experts felt that this was due to the deficiency of certain minerals. However, some suggested that the video was misinterpreted and it was just grass taken from the waterbed which looked like fish, but then, it was jocularly concluded that it must have been a 'Bengali elephant' (for those unfamiliar, all Bengalis relish fish, irrespective of their caste affiliation).

The entire experience was great for me and I am very happy that I was a part of it. I had not learnt so much about elephants any time before and I was glad that I learnt it directly from the experts than from the usual television shows.

Biographical sketch



Aparna is an active volunteer with organisations like Blue Cross, Green Peace and A Rocha-India. She is a lover of animals, and helps them in distress. She has travelled to places like Nepal to volunteer with the Modern Indian School to bring awareness to people to preserve their natural environment. Some of her notable volunteering work involves saving the Ridley turtles from human intervention, and rescuing of stray puppies from flood waters during a heavy downpour in Chennai in 2007.

Appendix 1

Appendix 1: Working groups and the topic selected for the review process

Group 1: Space, Enclosure & Exercise

Dr. K.C. Panicker
Dr. V. Madhulal
Dr. N.S. Manoharan
Chair: Mr. Ajay A. Desai
Observer: Dr. Shiela Rao

Group 2: Behaviour, Interaction, Work & Food

Mr. A.N. Prasad
Dr. Kushal Sarma
Mr. M.C. Malakar
Chair: Dr. A.J.T. Johnsingh
Observer: Ms. Deepika Prasad/Ms. G. Aparna

Group 3: Health and Reproduction

Dr. N. Kalaivanan
Dr. T.P. Sethumadhavan
Mr. Harish Bhatt
Chair: Dr. N.V.K. Ashraf
Observer: Mr. G. Vikram/Dr. Shalu V. Kumar

Group 4: Mahouts, Owners, Management & Record keeping

Dr. E.K. Easwaran
Ms. Nibha Namboodari
Mr. T.S. Mohan Das
Chair: Dr. Vijay D. Anand
Observer: Mrs. Suparna Ganguly

Surendra Varma is working as a Research Officer at the Asian Elephant Research and Conservation Centre (AERCC, a division of Asian Nature Conservation Foundation), based at the Indian Institute of Science, Bangalore, south India. He is also a member of the IUCN/SSC Asian Elephant Specialist Group. He has extensive experience in carrying out studies and surveys in India, Myanmar and Vietnam on elephant and other large mammal population, habitat and distribution. He is actively involved in carrying out capacity building in elephant census methods, habitat mapping and survey techniques for numerous participants from India and other Southeast Asian countries. He is also involved in developing conservation technology tools as well as a comprehensive study on the captive elephant population, their welfare and management in India.



Deepika Prasad has done her Masters program in Wildlife Biology from AVC College, Mayladuturai, Tamil Nadu, and worked at the Rajaji National Park, Uttarakhand, in collaboration with the Wildlife Institute of India, for her dissertation and was awarded a Gold medal in 2007 for overall MSc program. In 2005, she volunteered for a joint program of Asian Nature Conservation Foundation (ANCF) and Compassion Unlimited Plus Action (CUPA) to study the activity budget of captive elephants. In 2008, she joined the CUPA-ANCF research team working on captive elephant ecology and management. Currently, she works on the National Elephant Corridors Project launched by the Wildlife Trust of India, demarcating and studying elephant corridor habitats in Uttarakhand. Her research and conservation interests are to study the various aspects of elephant ecology and behaviour and link their influences to conservation issues.



Project Elephant (PE), Ministry of Environment & Forests, Government of India sponsored scheme, was launched in February 1992 to provide financial and technical support to major elephant-bearing states in the country for the protection of elephants, their habitats and corridors. It also seeks to address the issues of human–elephant conflict and welfare of elephants in captivity. The Project is being implemented in 13 States/UTs, across India, viz. Andhra Pradesh, Arunachal Pradesh, Assam, Jharkhand, Karnataka, Kerala, Meghalaya, Nagaland, Orissa, Tamil Nadu, Uttaranchal, Uttar Pradesh and West Bengal.

Compassion Unlimited Plus Action (CUPA) is a non-profit public charitable trust registered in 1991 that works for the welfare of all animals. Since 1994, CUPA has worked in close collaboration with government departments and agencies on various projects. CUPA's mission is to protect animals from abuse and violence and to do what may be required to alleviate their suffering at the hands of humans. CUPA does not differentiate between pet, stray or wild animals, since often all require assistance and relief from cruelty, neglect and harm. The organisation's objective has been to design services and facilities which are employed fully in the realisation of these goals.

Asian Nature Conservation Foundation (ANCF) is a non-profit public charitable trust set up to meet the need for an informed decision-making framework to stem the rapidly declining natural landscape and biological diversity of India and other countries of tropical Asia. The Foundation undertakes activities independently and in coordination with government agencies, research institutions, conservation NGOs and individuals from India and abroad, in all matters relating to conservation of natural resources and biodiversity, endangered flora and fauna, wildlife habitats and environment including forests and wetlands. It participates and disseminates the information, knowledge and inferences gathered from professional, academic and public forums.

World Society for Protection of Animals (WSPA) With consultative status at the United Nations and the Council of Europe, WSPA is the world's largest alliance of animal welfare societies, forming a network with 910 member organisations in 153 countries. WSPA brings together people and organisations throughout the world to meet the global animal welfare issues. It has 13 offices and thousands of supporters worldwide.

Photo credit: Front cover: Surendra Varma, Page 72-Elephant and Mahout: Ajay A. Desai, Page 80-Figure 1&2 , Page 83-Figure 3&4: N. Kalaivanan, Page 89-Figure 1a,b,c, Figure 2, 3a,b,c, Page 90-Figure 4, Elephant and Mahout: V. Madhulal, Page 114: Padmini Balchander, all other photographs: Savitha Nagabhushan.

DECCAN Chronicle

BENGALURU - FRIDAY - 30 MAY 2008

Jumbo relief soon



A young tusker grazes in the Bandipur National Park. The jumbos are under threat in both the wild and in temples. — A PHOTO BY JOE HOOVER

BY JOSEPH HOOVER

BENGALURU

May 29: Our friendly jumbos are in for a reprieve. No longer will they be allowed to be abused by temple priests and temple elephants. Their welfare is also expected to be improved in forest reserves. Project Elephant, which was set up in 1992, will meet in the city on Friday to discuss the "blue and white" captive elephants, which are reportedly being persecuted by poachers.

Disturbed with the happenings in Kerala, where a couple of elephants have been charged by fire, said Tandi Naka, A.N. Pandal, director, Project Elephant, has announced a meeting of chief wildlife warden from all elephant states.

A study done by Compassion Unlimited Plus Action, on behalf of Project Elephant, has revealed that

captive elephants are being exploited by mahouts in temples.

It is believed that there are over 100 elephants in temples in Kerala and about 50 in Tamil Nadu. "Our objective will be to ensure that they are not used as 'musical instruments'", said J. Jeyaraj, PCTP, Bangalore. Asked if elephant rides would be done away with in temples, Mahout said, "As long as they are looked after well, the forest department could employ them for recreational and forest related work. But, we should ensure that they are not used as 'musical instruments'."

When told that a tusker in the Dargah elephant camp had broken its back and had died after taking a fall, Mr. Jeyaraj said, "If the elephant is not taken care of, it should not be allowed to be taken for a ride, even if it is a temple ride." If the authorities crack the whip, mahouts could live in peace.



Respite for captive elephants

BY ANITA S. UPADHYAY

BENGALURU

May 29: It is good news for one elephant which is found, kept alone and safe to "work" long hours. There are about 4,000 such captive elephants under various ownerships in India and most of them are suffering from the physical and mental disorders. The Asian Elephant research and Conservation

Centre of India and CUPA, an NGO engaged in wildlife rehabilitation of elephants in particular, have come out with the set of guidelines for the welfare of the captive elephants. The guidelines are the result of an extensive survey of captive elephants in 10 Indian states and reflecting the biological state of 1,211 captive elephants. The recommendations are expected give impetus to

need

Some of the suggestions include daily bathing of elephants, change in diet, providing veterinary doctor on call and providing nutritious food.

captive elephants.

Some of the recommendations include daily bathing of elephants should be made mandatory, change in diet, providing nutritious food, keeping them in the semi-wilderness on call and banning the use of elephants for ritual and commercial purposes.

"The elephants in India are owned by forest department, temples, circuses and individual owners," said Jeyaraj Varna, research officer, AERC, a division of Asian Nature Conservation Foundation, Bangalore.

While the elephants in the custody of forest department enjoy their stay in the semi-wilderness, the elephants in the circuses and temples go under severe stress since they are chained in one place for long hours.

The Workshop on Welfare Parameters and their Significance for Captive Elephants and their Mahouts in India was organized under the auspices of the Project Elephant Directorate, Ministry of Environment and Forests (MoEF), Govt. of India. It is the outcome of an all-India survey (covering 1200 captive elephants in 12 states of India) conducted by Compassion Unlimited Plus Action (CUPA), Bangalore, in technical collaboration with the Asian Nature Conservation Foundation (ANCF), Bangalore, sponsored by World Society for Protection of Animals (WSPA), U.K. To analyse the large set of data collected initially, parameters and their properties were identified, defined and ratings for each parameter and its property were assigned. Later, this entire process was critically reviewed by experts through the workshop.

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